Interior turbulence and the thresholding of atmospheres

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Turbulent beginnings

Turbulence is flow plus instability. It is a quality of chaotic flow that occurs beyond a certain limit point in a system. We encounter moments of turbulence throughout our everyday lives — the flow of tap water, adding milk to a cup of tea, turning a street corner in the city and being buffeted by a gust of wind. In a meteorological sense, turbulence occurs when two differing masses of air collide, creating pockets of disruption as the various forces try to reconcile themselves. It is a disruptive process of coming together. Seemingly stable objects and systems become disrupted by the chaotic qualities that are introduced by turbulence. Instability and unpredictability are turbulence's inherent qualities, qualities that tend to carry negative connotations compared to the contrasting terms – stability and predictability. Although, historically, turbulence has been identified with disorder or noise, more recently it has come to be understood, despite appearances, as highly organised (Prigogine & Stengers 1984: 141). Turbulence occurs across a range of scales, from the very large to the microscopically small. It is dynamic, and dependent on time, occurring as a system evolves and crosses certain threshold conditions.

A degree of turbulence is inherent in all situations. Typically, life is only manageable because we smooth over this implicit turbulence and look for macro-scale stability in the form of defined, knowable objects, and in predictable events. Timothy Morton for instance points to this dichotomy when he asserts that instability is an ontological given, saying that "although there is no absolute, definite 'inside' or 'outside' of beings, we cannot get along without these concepts either" (2010: 38). Given this, it is productive to disrupt our habitual grasp of the world through solid, seemingly certain things. Attending to the turbulent qualities of all things opens up new ways of thinking about the relationships constituting the world.

The multivalent term *atmosphere* implies turbulent possibilities. Atmosphere refers both to the layers of gas surrounding a planet, and to the mood or feeling of a situation or place. While the word atmosphere conflates both these possibilities, in either case it suggests an in-between state, a state, as Ben Anderson writes, "between presence and absence, between subject and object/subject and between the definite and indefinite" (2009: 77). As such, atmospheres mediate. They also continually reformulate the various entities and forces that constitute them. Making sense of atmospheres invites bodily engagement, whether by absorbing and being affected by diffuse ephemeral qualities, or by recognising our own contribution to, and place within, these qualities. Moreover, the perception of atmospheres occurs before, and in fact moves faster than, modes of conscious recognition and its representational outlets. This is because atmospheres condense spatial and temporal relations that implicate us in a moment of immediate possibility.

Key to this understanding of atmospheres is a recognition that the relationships between entities are always in negotiation, that a degree of turbulence, rather than static arrangement, defines relationality. Nothing is fixed or stable, and everything is contingent on everything else. Sustaining this uncertainty, keeping things unfixed and in play, and suspending the process of rigid definitions, are parts of an active process that I call *thresholding* in this paper. Further, the practice of thresholding requires working and thinking at the limits of tangible things, and suggests that productive sites for thinking and making can be found at the limit points of material, spatial and conceptual categories. At these edges things become unstable and with this instability is the possibility of knowing things anew. Like atmospheres, this process of thresholding requires

attentiveness to states of co-formation and changes in and between things. Thresholding is a particular mode of being on edge. It implies uncertainty and a certain anxiety too, which provokes an ongoing series of questions regarding the spaces and objects around us.

Interior turbulence

What Jane Rendell calls "critical spatial practices" (2006: 21) have the potential to call into question habitual spatial encounters and conceptions while bringing to the fore subtle or ephemeral characteristics ordinarily overlooked. In this paper I outline a particular example of critical spatial practice – what can be thought of as an atmospheric interior. Specifically I explore what can be termed interior turbulence, a phenomenon that highlights three different registers of the atmospheric interior. Firstly, interior turbulence suggests an alternative to the typical approach to interiors, which tend to place emphasis on separation and fixed enclosures. Secondly, this term implies uncertainty, provisionality and changefulness – even a sense of turbulence within ourselves. Thirdly, interiors that are thought and experienced atmospherically require a different approach to space-forming and design. Interior turbulence raises a number of questions too. For instance, what is the role of thresholding in the formation of the atmospheric interior? What seemingly stable categories might be thrown into turbulence by thinking of practice in this way? The project outlined here attempts to answer these questions, and in the process, find value for design research in turbulence and uncertainty.

Fig. 1 Cloud Sound (2012). [Photograph of installation project, Bundoora Homestead Art Centre, Victoria, Australia, all images copyright the author]

Cloud Sound was developed in 2012 for an exhibition at the Bundoora Homestead Art Centre, a converted Victorian homestead now operating as a regional gallery in greater Melbourne. The installation was located in one of the former bedrooms, a high-ceilinged space of five by seven metres. For the period of the exhibition all furniture and furnishings were removed, leaving only

the fireplace and its ornate timber surround as a key feature in the darkened space. Emanating from the fireplace (where a computer screen displayed an image of networked lines) was a whistling sound suggestive of wind passing through the room. On closer inspection, the computer image revealed numbers and graphic objects whose values were erratically shifting and reforming, suggesting the sound's responsiveness to unseen qualities or forces. Further, the windows were blacked out, but featured a small, lensed oculus, turning the darkened room into a large *camera obscura* that projected an upside-down image of the homestead's garden and neighbouring suburban development across the interior. Incongruously inverted across the walls and decorative timber mouldings were poplar and macrocarpa trees, a rose garden, roof tiles, a garden path, an unused bus stop, suburban rooftops, and the Yarra Ranges beyond the limits of the city. Capturing this outside world in real time, the projected image was subtly but constantly shifting in response to atmospheric states beyond – clouds drifting and reforming, trees swaying in the breeze, cars looping periodically up a wall, over the ceiling and down the opposite side. A person was similarly caught walking along the garden path, while a small wind-generator on a suburban rooftop was seen spinning with an unintelligible blur only to slow almost to a standstill as the wind died.

Cloud Sound was an exploration of the distinct, but inseparable, atmospheres of weather and interior. The project aimed to furnish the otherwise sheltered withdrawal of the bedroom with an outside, contingent atmosphere, one rich in transitional and displaced thresholds. As such, two particular turbulent dynamics were found at work in the project: the first entailed a displacement of spatial propriety, and with it, the normative placements of weather and interior ambience; the second entailed seeing in *Cloud Sound* an inscriptive process, one that could be understood as a kind of spatial drawing that foregrounded the complex relations between issues of representation, experience, ideas, matter and immateriality.

Spatial turbulence

Starting with the first of these two turbulent dynamics, *Cloud Sound* aimed to collide discrete entities and introduce traces of extraneous forces into a sheltered space. The result was a space in-between, one that crossed inside and out, here and there, then and now. With this production of in-between-ness, atmospheric qualities were brought to the fore. The typical distinctions between exterior and interior, weather and ambience, organism and environment were brought into questioning relation in the project. More specifically, this questioning relation became the middle ground of a continual renegotiation.

Given the incongruous play of light and image fields across the gallery's interior surfaces, Sylvia Lavin's consideration of architectural surfaces in *Kissing Architecture* (2011), offers a useful reference for considering *Cloud Sound*. Lavin is interested in the interactions between digital video installation – particularly by artists such as Pipilotti Rist and Douglas Aitken – and existing architectural surfaces. Thinking of such interactions as a kind of amorous contact, she writes:

> [The] kiss is the coming together of two similar but not identical surfaces, surfaces that soften, flex, and deform when in contact, a performance of temporary singularities, a union of bedazzling convergence and identification during which separation is inconceivable yet inevitable. Kissing confounds the division between two bodies, temporarily creating new definitions of threshold that operate through suction and slippage rather than delimitation and boundary. (2011: 5)

In the installation at Bundoora Homestead this kiss was played out between the suburban city landscape and a Victorian-era interior, although here it was not video projection that was the medium of contact, but instead a *camera obscura* pressing its image capture into the existing

architecture. The project eschewed another facet of video production – the pre-recording of images. Instead, the *camera obscura* of *Cloud Sound* transmitted an unpredictable and weather-dependent image repertoire. Conversely, the interior offered its own contingent interception in the form of built historical elements and visitors. Given this, how might we understand the surface interaction achieved in the work? What is the between of their meeting? As Lavin writes of the collision of image field and building, these types of surface interactions are where "architecture gets close to turning into something else" (2011: 26). At stake is an unanticipated vulnerability and in this play of surfaces pulled tightly together a slippage of meaning occurs – a kiss that melds interior surface and projected light.

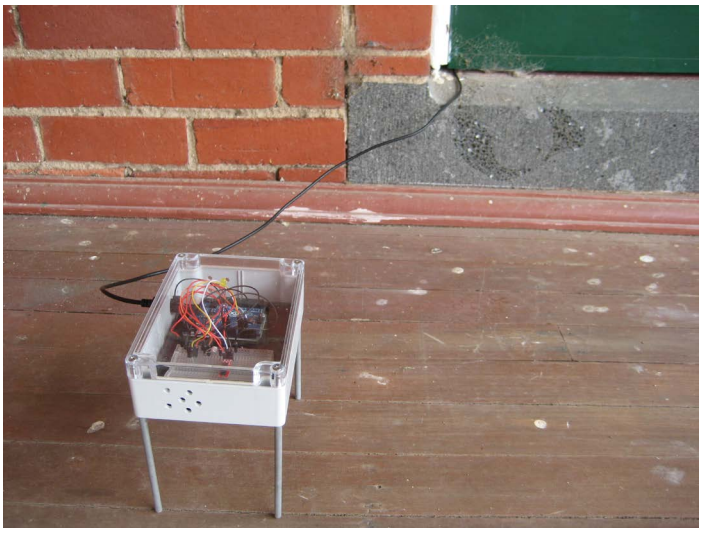

Fig. 2 Cloud Sound (2012). [Detail of weather sensors]

The audio installation component of the work also acted to integrate and mesh together the exterior and interior atmospheres, converting the changing qualities of the weather beyond the climate-controlled gallery into an 'aural cloud' tempering the interior. A box containing a variety of weather sensors (pressure, humidity, temperature and light intensity) was located on the balcony outside the *camera obscura*, with a cable running into the computer housed within the fireplace. The computer ran a small program specifically developed to translate weather data into sound utilising fluctuating input data converted into audio signals via a process known as granular synthesis. This form of synthesis uses hundreds of very small audio samples of between 20 and 100 milliseconds, whose density, tone and duration are controlled by the software program responding to the inputs of weather data. In this case granular synthesis produced a cloud-like sound structure that emphasised texture and pitch rather than a linear representational sound recording.

This component of the project translated air pressure at the macro scale of weather into finer-grain disturbances in air pressure within the gallery's interior. As such, atmospheric pressure became a way of providing continuity across divergent spatial and temporal scales. The slowly changing soundscape challenged the timescale of human sensitivity, for over the period of an hour or more (the likely duration of any visitor), there were quite minimal changes in the overall nature of the perceivable sound. In larger contexts, micro-changes in the weather's make-up similarly occur in ways that are beyond ordinary human perception. In such cases, the best we can typically do is catch a scent in the air that precedes the approach of rain clouds, or a subtle, bodily sensing of the drop in air pressure as a front approaches. Within human consciousness weather is fairly stable, with slow changes in cloud cover, and very few rapid changes in temperature, pressure or humidity. In the gallery's interior, the soundscape likewise changed across the course of the day, though

in a more pronounced way. In these terms, the sound environment of *Cloud Sound* aimed to amplify the presence of subtle turbulence that backgrounds all experience.

Atmospheric ambiguity

Weather and architecture are intimate companions, particularly given architecture's long-standing role as a provider of shelter. Yet for Mark Wigley the issue of sheltering entails more than climatic moderation, and as he says:

> Buildings have always been seen to stabilize, to secure, to produce a sense of order in a chaotic world. Architectural discourse begins with the thought that the first buildings kept turbulence outside … Architecture produces the effect of an outside. It invents the idea of the exterior, the unruly territory that is tamed by a shelter. (2006: 6)

What the architectural envelope achieves then is more than just a filtering or tempering of contingent atmospheric states; it consolidates architecture by placing climate beyond the bounds. At stake in this distinction is avoidance of turbulent limit points, and with it, threshold where things get "close to turning into something else" (Lavin 2011: 26). *Cloud Sound* worked against this impetus to decisively separate interior and exterior experiential fields – an impetus particularly strong with Victorian-era buildings whose architectural elements (shutters, verandahs and fenestration) and décor strategies (heavy curtaining and dark interiors) work to distance a climatic outside. This separation was amplified by the homestead's subsequent adaptation into a public art gallery, requiring even more stringent forms of climatic tempering and regulation of interior weather. Contesting this, the installation project sought to blur where interior and exterior could be imagined to reside. This blurring sought to bring the ambiguity between atmospheres as weather, and atmospheres as interior ambience, to the foreground. The conflated term 'atmosphere' describes an understanding of the interior as a dynamic, affective condition condensing various forces.

Fig. 3 Cloud Sound (2012). [Detail of camera obscura image focussed across body. Photograph by Meg Hale]

For Anderson, atmospheres are remarkable for their interjecting of affective aspects into emotional registers. Moreover, as he writes, atmospheric states are "taken up and reworked in lived experience – becoming part of feelings and emotions that may themselves become elements within other atmospheres" (2009: 79). In other words, we are implicated and actively involved in the production

of atmospheres. In *Cloud Sound*, the audience experienced its interior atmosphere via contingently projected light and images resulting from the action of the *camera obscura*. Key in the action of the latter was the focal plane of the lens itself. This plane (or more accurately focal *sphere*) existed near the middle of the room and spread equidistantly across the walls, floor and ceiling, as well as across the intervening spatial volume. While not immediately obvious upon entering the room, the point at which the image came into focus could be discovered through bodily engagement – in other words, by experientially discovering image-clarity through motion. In this way the focal sphere could be understood to have created an immaterial and contingent threshold or spatial division. Just as the projected light bent around the interior elements distorting the images carried with it, bodies and other objects in the room similarly became deflecting agents. By moving around the space and attending to the image projected across one's body, it was possible to capture and bring into focus a small section of the light-image field. Once this focal plane was discovered it encouraged people to inhabit a narrower zone within the interior, one whose boundaries were invisible, but defined by a discoverable, optical phenomenon. Further, this conjunction of body, light rays from outside, and the space of the focal plane, served to mesh the three together. Like Lavin's kiss though, this union was a temporary one, given the turbulent play of elements involved. In fact the quest for union might be better understood as a union in continual collapse, for, as Lavin asserts again relative to kissing, at stake in this type of intersection is "not a collaboration between two that aims to make one unified thing", but rather, is an "intimate friction between two mediums that produces twoness – reciprocity without identity – which [in turn] opens new epistemological and formal models for redefining architecture's relation to other mediums and hence to itself" (2011: 54-55). The entanglement of surfaces, spaces and bodies in *Cloud Sound* similarly brought into awareness shifting modes of twoness that situates things simultaneously together and apart.

"Mesh" is a word I have favoured above in describing the connections achieved in *Cloud Sound*. It similarly carries with it the paradoxical sense of being together-but-separable that Lavin attributes to the notion of kissing. Extending my use of the term mesh is Morton's deployment of it in *The Ecological Thought* (2010). As he describes:

> 'Mesh' can mean the holes in a network and threading between them. It suggests both hardness and delicacy. It has uses in biology, mathematics, and engineering and in weaving and computing … It has antecedents in mask and mass, suggesting both density and deception. By extension, 'mesh' can mean 'a complex situation or series of events in which a person is entangled; a concatenation of constraining or restricting forces or circumstances; a snare'. (28)

Useful for Morton too is the word's brevity: "'Mesh' is short, shorter in particular than 'the interconnectedness of all living and non-living things'" (2010: 28). Bypassing rigid, conceptual categories, the term calls up the question of where environments can be thought to begin and end. In fact, can any line be drawn between an environment and its non-environment? Radicalising this understanding, environments can be understood to be without limit. They would potentially be inclusive of everything. Similarly, it is productive to ask how it is that we are able to think of ourselves as standing out, in the foreground, distinct from an environment. The notion of a meshed existence challenges us to rethink our nature relative to all things. One advantage of this reorientation is that it enables us to rethink all relatedness. For Morton, this is what ecological thought entails, "a radical openness to everything" (2010: 15). So if the notion of the mesh is indicative of an open relatedness, it asserts that there is "no absolute, definite 'inside' or 'outside' of beings. [And yet…] we cannot get along without these concepts either" (2010: 38). At stake then is the contingent practice of thresholding, one inseparable from a relational turbulence. It is precisely this that *Cloud Sound* sought to find and enact through a meshwork of bodies, interior places and environment.

Fig. 4 Cloud Sound (2012). [Photograph of installation project]

Representational turbulence

A key aim of *Cloud Sound* was to blur the distinctions between the built, the bodily, and the ephemeral qualities of space. Like contemporary projects by Olafur Eliasson or Robert Irwin, say, this project exists at the junction between art installation and architectural practice. As such, the gallery space of the Bundoora Homestead Art Centre did not simply 'house' the project; the architectural form and details themselves shaped the play of images generated by *Cloud Sound*. Similarly, when bodies within the gallery acted as a receiving screen for the projected images, they too shaped and re-shaped what could be experienced. Displacing the familiar surfaces of the room and the appearance of persons was a slowly shifting array of sky blues, the red of roofing tiles and the various greens and browns of the surrounding gardens and suburban rooftops. Accompanying this meshing of interior and exterior was the audio component, which more abstractly displaced atmospheric conditions inward as acoustic differentials.

The deployment of the *camera obscura* in *Cloud Sound* drew on older representational histories. In particular these devices were originally employed as an aid to drawing before, and then alongside, developing geometric systems that used perspective to represent the three-dimensional nature of space (Kemp 1990: 188-199, Gorman 2003: 296-299). Pre-empting representational drawing, the *camera obscura* literally captured a living visual field, casting it onto a surface where it could be apprehended by line. However, in *Cloud Sound* the drive to fix down was suspended and the flow of images could be imagined to have drawn themselves suspended somewhere between modes of representation and production. In this way, I have attempted to think of the space of the *camera obscura* as itself a spatial drawing operating at the margins and in the liminal space of the not-quite-material, not-yet-drawn. *Cloud Sound's camera obscura* produced a 'live' drawing, one that mirrored the constantly changing conditions beyond the gallery interior. This contingency implies a close relationship between designing and making so that the usual architectural procedure in which drawing precedes construction is reversed; the drawing out of images can be understood as space-making in and of itself. Jonathan Hill, in *Immaterial Architecture* (2006), assigns drawing a

special role in the history of architectural practice; it is the means by which the architect's activity can be imagined as intellectual, rather than mere manual, labour. Questioning this demarcation, Hill is interested in recognising in representational processes ones analogous to building – for example, reciprocal actions like "building the drawing" and "drawing the building" (Hill 2006: 57). These processes acknowledge that neither the act of drawing or building is discrete and distinct from the other. Instead, turbulent inter-relationships exist between these activities. In a similar way, I have attempted to think of the *camera obscura* of *Cloud Sound* as simultaneously drawing and building space through its combining of projected light and inhabitation.

Fig. 5 Cloud Sound (2012). [Photograph of installation project]

By emptying and darkening the room, only then to fill it with projected daylight and synthesised sound, *Cloud Sound*, in its redeployment of volume, surface, and interior and exterior placement, created the conditions whereby a visitor was able to negotiate the material or immaterial status of these constituent elements. The project condensed both the immaterial practice of spatial drawing and a tangible modification of spatial and material qualities. At stake for the audience was the renegotiation of both the installation project and the architectural space in which it was housed. If the 'architecture' here is an ephemeral one, it was so in the sense that Hill envisages an "immaterial architecture" – one that emphasises "the perceived absence of matter more than the actual absence of matter" (Hill 2006: 3). Acknowledging the creative and formative role played by users of architectural spaces is particularly important in understanding the production of the atmospheric interior as relationally enacted, and not pre-staged by a single designer. Rather, in the atmospheric interior the role of the architect/designer is to create conditions in which a user or audiences can contribute to the material or immaterial status and make-up of the 'architecture' (Hill 2006: 3). In this sense, the light field of the *camera obscura* foregrounded both a perceived absence of matter, and the potential for enacting an alternative and varying materialisation of space. In this situation thresholding can be understood to comprise a space of suspended decision-making, one whose openness maintains the potential for co-forming the spatiality of the experience.

Disciplinary turbulence

Consistent with Morton's ecological thought, the inter-relationships constructed by *Cloud Sound* sought to play out the complex, sometimes paradoxical, nature of the conceptual categories we use to make sense of things. Opening up new possibilities for categorisation, or deferring categorisation altogether, provided an opportunity to think freshly about the status and agency of matter, activity and subjectivity. As such, what I have attempted to undertake with *Cloud Sound* is a hybrid critical spatial practice, one that pursues an expanded idea of drawing, material experimentation, and the co-formation of atmospheres. This intersecting of practices – what might be variously understood as inter-disciplinary, trans-disciplinary or cross-disciplinary – better fits what Mark Dorrian has referred to as a-disciplinarity. Noting how all disciplinary practices "register the partial, provisional, and constructed character of any historically situated disciplinary discourse", Dorrian instead suggests an alternative description, one that is defined by what practices are not (2009: 195). On that occasion, Dorrian was responding to Wigley's assertion (1998) that atmospheres ought to be at the core of what architecture produces. This seemingly positive claim about what architecture is immediately causes "problems of determination and [disciplinary] capture" by Dorrian's account (2009: 196). Alternatively, the figure of the cloud, with its resistance to fixity and determinacy, might operate as a figure for a-disciplinarity because it eschews bounded arenas of knowledge (Dorrian 2009: 196). Like Lavin's appeal to the in-between, or thirdness of the kiss, there is, at times, value in eliding "a clear conceptual division between outside and inside", particularly the demarcation of disciplines. Commensurate with Dorrian's a-disciplinarity, the edgeless meteorological transpositions in *Cloud Sound* aimed to draw out a strange intimacy – an intimacy aligned with Morton's ecological thought. As such, "everything is intimate with everything else", not in the sense of a diffuse inclusion (for which "spheres or concentric circles" would be figures), but on the basis of a contingent touching brought about by multiplying thresholds (Morton 2010: 78).

At stake in these diverse theoretical positions are questions of agency enacted at intersections and interconnections. What I have tried to outline are ways of occupying and developing positions that resist pre-existing frameworks. Instead, it is my hope that sensitivity to, and engagement with, a practice of thresholding brings us closer to the things around us. In *Cloud Sound* is found an attempt to draw out the spatial, material and representational complexity of this becoming-closer. For an audience, this meant finding a richer place within a dynamic, turbulent flux.

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