Quasi-Materials and the Making of Interior Atmospheres

John Stanislav Sadar

Swinburne University of Technology
Australia

Abstract

In The Architecture of the Well-Tempered Environment*, Reyner Banham presents a parable in which, having come across an amount of wood, a nomadic tribe must decide how to use it to keep warm overnight: build a structure or build a fire (and burn the wood as fuel). The first of these uses the materials directly to create an amenable interior condition using the tangible materiality of geometric construction. The second, however, generates heat from combustion, thereby creating an intangible, graduated, thermal interiority, which one can draw deeper into, by moving closer to the fire, or recede from, by moving away.*

Interior architecture has largely been concerned with achieving shelter and creating an interior atmosphere through the dependability and predictability of physical materials. Less often has interior architecture considered the interiority achieved through the temporal contingency of atmospheric quasi-materials (taking a cue from Tonino Griffero's quasi-things), phenomena such as light, sound, temperature, and humidity. While these often strike one as outside of the realm of designers, their effects profoundly colour our experiences of our environments: the smells of street food, the heat of the metro air exhaust, the veil of fog rolling in. A selection of student projects probing quasi-materials in interior architecture reveals their nature and potential for making interior environments. More akin to building a fire than fitting out a shell, these projects question existing tenets of interior architecture, while they enable types of interiority that are fluid, graduated and temporal.

Keywords: atmosphere, materiality, interiority

Correspondence Address: John Stanislav Sadar, Department of Architecture and Interior Design, Faculty of Health, Arts and Design, Swinburne University of Technology, Internal Mail No H80, PO Box 218, Hawthorn, VIC 3122, Australia. Email: jssadar@gmail.com/jsadar@swin.edu.au

Introduction

In 1968, Reyner Banham produced the first historical account of the built environment in terms of environmental management (Banham, 1984). Early on in *The Architecture of the Well-Tempered Environment* he presents a parable of the origins of environmental control. A nomadic tribe has come across an amount of fallen wood just as night is approaching, and must choose how to use it to keep warm: build a structure or build a fire. The tribe that chooses the first option, and builds a structure, comes to view space as being defined by tangible surfaces: walls, floors and ceilings. However, the tribe that builds a fire comes to view space as gradations of intangible environmental energy and comfort, in which one is closer or further away, upwind or in the path of smoke (Banham, 1984, pp. 18-20).

Banham presented the built environment as something that, rather than being about the pleasing organisation of materials, was chiefly concerned with providing an ideal atmosphere, ensuring enjoyable qualities of light, sound, heat, humidity and air quality. More than just providing amenable conditions, these colour every aspect of our spatial experiences; we experience the dimensional and material composition of our spaces through them. But even as energy efficiency has come to the forefront with the growing awareness of climatic catastrophe, our ways of understanding interior space remain understood within a notion of spatial definition that is fundamentally material. Designing with the atmospheric energies of our interiors as materials (or rather quasi-materials) thus questions the existing tenets of interior architecture, at the same time as they enable types of interiority that are fluid, graduated and temporal, as demonstrated in projects by interior design students for environmental technology coursework lead by the author demonstrates.

The Atmosphere of Interior Architecture

As Banham relayed, building manipulates environmental conditions so to align them with an ideal of human comfort. For architect Philippe Rahm, this amounts to no less than moving the interior into a more hospitable climate via regenerative means. Rahm writes,

> The actual origins of architecture stem from a desire for local geographical shift… going into a house in winter is the equivalent of an instantaneous movement on the globe, from north to south… a motionless journey in space, a local spatial contraction. (Rahm, 2005, p. 8)

When we design interiors, we are transporting the occupant to a

John Stanislav Sadar

more desirable locale, free of the annoying breezes, excessive humidity levels, noxious odours, traffic noise, and wide fluctuations in light levels that may characterise our outdoor environments. Our interiors thus manage the environments in which we carry out our day-to-day living, and in so-doing transport us to an idealised place.

As architect Peter Zumthor writes, we do not perceive and experience a place directly, but rather its atmosphere. The atmosphere of a place, he argues, is the result of the totality of the attributes of an environment simultaneously stimulating the perceptual system. As an example, Zumthor describes being emotionally moved when sitting in a church: "So what moved me? Everything. The things themselves, the people, the air noises, sound, colours, material presences, textures, forms too - forms I can appreciate" (Zumthor, 2006, p. 17).

Atmosphere is that first impression when we enter a place and know almost immediately whether we like or dislike it; when one experiences an atmosphere, it is powerful, almost instantaneous, and colours all our spatial experiences, profoundly influencing our perception (Griffero, 2017, p. ix). The more deeply we feel an atmosphere, the less adequately we can put it into words. It is material in that it is affected by the material presence of objects (their heaviness or weightlessness, solidity or transparency), the relationship of materials to one another, how people and objects occupy and define space, and the distance between objects in relation to our bodies. But it is also immaterial, in that it encompasses the behaviour of light, sound, heat, and other environmental phenomena, and how these phenomena permeate our interiors. The atmosphere of a place is the result of the totality of the attributes in an interior environment simultaneously stimulating the perceptual system.

For these reasons, as architect Juhani Pallasmaa argues, we sense the atmosphere of a place with our entire bodies. The atmosphere of a place is always surrounding us, yet always peripheral to our perception (Pallasmaa, 2014, pp. 38-39). It is so omnipresent and pervasive as to be unseen. For philosopher Gernot Böhme, the combined spatial and material nature of the built environment means that we never so much see the built environment as we *feel* it with all of our senses (Böhme, 2006, pp. 399-403). Philosopher Tonino Griffero writes that atmospheres "modulate the lived and predimensional space whose presence we feel"(Griffero, 2017, p. xi). Spatial experience, for Pallasmaa, engages not only the eye, but the ear, nose, skin, tongue, skeleton and muscle, and their multifarious interactions (Pallasmaa, 2006, p. 31). When we occupy a space, we occupy it aurally, thermally, olfactorily, kinaesthetically, and visually.

The atmosphere of the place is the sum of these and more, as he illustrates with the following example. "A walk through a forest or Japanese garden is invigourating and healing because of the essential interaction of all sense modalities reinforcing each other; our sense of reality is thus strengthened and articulated" (Pallasmaa, 2006, p.31).

We feel our built environments through our presence in them, and the result is the feeling of mood, which, in Böhme's words, "… contributes to sensing where we are" (Böhme, 2006, p.402). For Zumthor, each of the "seven realms of sensory experience" shapes and is shaped by our moods, feelings and expectations to colour our experiences. He writes:

> What else has moved me? My mood, my feelings, the sense of expectation that filled me while I was sitting there. Which brings that famous Platonic sentence to mind: <Beauty is in the eye of the beholder.> Meaning: it is all in me (Zumthor, 2006, p. 17).

As Böhme explains, spatial perception is thus participatory, and involves our own feelings and predispositions (Böhme, 2006, p. 402). Through their proclivity for creating space, our sensory perceptions in combination with the external agents which produce and carry sounds, smells, light, and heat are affecting our moods, and shaping our atmospheres. We each measure spaces in terms of our own perceptions, be they near or far, hot or cold, reverberant or muted (Böhme, 2006, pp. 399-403). As an example, Böhme writes that the *atmosphere of a city* is co-shaped by how life goes on in it and by how we feel in it. Because of this, a city is an immersive experience that never be adequately described, but must be experienced and felt first hand to appreciate (Böhme, 1993, pp. 46-50).

For Böhme *atmosphere* is a new entity in aesthetics, that is neither material nor immaterial, neither subject nor object, but an intermediary haze than sits in *between* the actively-perceiving subject and the quality-effusing object, which we move *through* and sense *through*. Atmospheres are not objective, but are object-like, in that they articulate their presence through discernible qualities, such as thick or thin, rich or veiled, red or blue. Nor are they entirely subjective, but are subject-like, in that they are sensed (Böhme, 1993, p. 122). Rather, as Griffero writes, atmospheres exist in-between subjects and objects, as an *intermediate* and *intersubjective*, connective layer through which we all perceive. Even though they may not physically exist, by engaging the body experientially, atmospheres have physical consequences (Griffero, 2017, pp. xvii-xviii). For example, Böhme notes, when we say a leaf is

green, it is because the leaf and the observer share a certain reality — an *atmosphere*. In his words, "Atmosphere is the common reality of the perceiver and the perceived" (Böhme, 1993, p. 122).

Once we accept that architecture and interior architecture are fundamentally concerned with space, Böhme argues, "… then it is easier to accept architecture's involvement with non-classical, i.e., non-objective means of constituting space, above all light and sound" (Böhme, 2006, p. 405). As constituents of the intermediary haze between subject and object, light, air quality, sound, humidity and heat deeply shape all of our spatial experiences, and even create their own spaces. For example, the light from a candle or torch forges luminous space from the darkness, and in doing-so, as Böhme reminds us, has the power to render that space serene, exhilarating, gloomy, festive or eerie (Böhme, 2006, p. 405). Thermal spaces, as Lisa Heschong notes, are created not only by the campfire, but also by, for example, the humidity of the swimming pool or the dryness of a sauna (Heschong, 1979).

Smell also creates its own space, as when one encounters the fragrance of a perfume store on the street, before actually entering through its doors. Headphones place the wearer in a completely different auditory space to that of the physical surroundings. For philosopher Jane Bennett, the atmosphere of a café arises from a complex of factors, both designed and otherwise: "A coffee house or a school house is a mobile configuration of people, insects, odours, ink, electrical flows, air currents, caffeine, tables, chairs, fluids, and sounds" (Bennett, 2010, p. 35). Just as the materials of our floors, ceilings and walls actively shape our interiors, so too do occupants, lighting and ventilation systems, equipment noise, and the sun and wind.

If we accept that architecture and interior architecture are spatial practices, then designers can take into our considerations all the ways of making space, including the visual, auditory, thermal, olfactory, kinaesthetic, and tactile. Yet, despite this, in the education of interior designers, studies of environmental phenomena are largely relegated to technical subjects in the area of building systems or to issues of the environmental sustainability of materials. These see the environment as posing a set of problems which can be solved with the appropriate systems, be they with respect to climate, resources, biodiversity, waste, allergies, or a growing population (Moxon, 2012). For example, healthy air quality might be ensured by providing proper levels of ventilation and air filtration in tandem with materials with low volatility (Pilatowicz, 1995). Similarly, noise might be obviated by proper material selections and detailing (Binggeli, 2016). Such an approach seeks to ensure good

performance by rendering environmental phenomena as neutral and unobtrusive as possible, and leaves their spatial, experiential, atmospheric dimension unexplored.

Atmosphere as a Quasi-Thing

Because of the *in-between* nature of *atmospheres*, they sometimes have the characteristics of tangible things and sometimes not. The planetary *atmosphere*, for example, is very clearly a thing, of whose fragility we have become all too aware of in recent decades. On the other hand, the *atmosphere* of a meeting, performance or experience refers to a feeling, mood, tone, mental state or emotive quality, as Gernot Böhme reminds us (Böhme, 1993, pp. 113-114). Yet, although much less of a measurable thing per se, anyone who has waited for that job interview knows, it is no less real in its effects. For Tonino Griffero: *"There is no doubt that everyday life is very much affected by entities that are not exactly things…" (Griffero, 2017, p. 2).*

Atmospheres, Griffero argues, arise from the cooperative relation between perception and the surroundings, including tangible things, intangible situations and what he calls *quasi-things* (Griffero, 2017, p. ix). Quasi-things occupy the vast space between sensorily-perceived qualities and tangible things; they can clearly be sensed, but also are clearly not corporeal. *Things* are materially cohesive and tangible, have a regular shape, and persist in time with qualities that tend to be homogenous. They can be easily measured, undergo physical changes over time, like weathering and wear, and thus have a clear past and future (Griffero, 2017, pp. 2, 10). In contrast, although *quasi-things* have a spatial extension, they have neither edges nor sides, like a cloud of vapour or a shadow or the zone of heat around a campfire. They cannot be divided and apportioned; yet they clearly possess differing levels of intensity. Because of their experiential nature, they exist in the here and now, without a clear past or future. Their presence can, at times, be far more immediate and intrusive than the presence of things, such as in the case of a persistent dripping sound, or a foul odour. Unlike *things*, *quasi-things* totally coincide with their phenomenal appearances; for example, although we may paint wood to resemble aluminium, only the foul odour can be the foul odour, and only the dripping sound can be the dripping sound (Griffero, 2017, pp.10-11).

Despite their powerful effects, Griffero argues, the lack of thing-ness about quasi-things has meant that they have never have been given their due consideration. He writes:

> The expressive qualities that, radiating atmospheres, become

quasi-things are both particular natural phenomena (twilight, luminosity, darkness, the seasons, the wind, the weather, the hours of the day, the fog, etc.) and relatively artificial phenomena (townscape, music, soundscape, the numinous, dwelling, charisma, the gaze, shame, etc.). These qualities are salient not despite being apparent and ephemeral, but precisely because of that. And yet, for that very reason, Western thought (and sometimes common sense) considers them devoid of reality as opposed to full things, which are endowed with borders, separated from others, perduring in time, and are normally inactive if not touched. (Griffero, 2017, p. ix)

For this reason, quasi-things are what Griffero calls an "attenuated form of reality" that does not exist fully. A musical melody, which through its expressive qualities generates a deep and intimate bodily response, is one example of a quasi-thing, as is pain, which although not existing in space, material, or objective time, affects each of us profoundly. Other quasi-things include the gaze, sound, colour, night, thermal properties, smell, weight, and time. Air is another example. We cannot see, touch, hear or taste it; we pass through it unencumbered when we walk, and communicate through it when we talk. We experience it as void. Yet, when it has pressure behind it to form wind, air becomes more accessible to us, as it blows our hair and newspapers. We can observe wind as it whistles, ripples water, and moves clouds, witness the destructive power of wind in a storm, and exploit wind to drive turbines and sailboats. In this way, wind is more thing-like than air; it is a quasi-thing. The wind is also an atmosphere, which characterises everything we encounter during our time spent outdoors on a windy day. The wind is both an atmosphere and a quasi-thing (Griffero, 2017, p. xvii).

In fact, Griffero argues, not only are atmospheres quasi-things, but also quasi-things radiate atmospheres. For example, at twilight, city lights evoke feelings of fantasy and spectacle, as discrete surfaces dissolve into a myriad of fragmented points of light, and the depth of shadows flattens into a shimmer (Griffero, 2017, pp. 108-110). Atmospheres are also the way quasi-things involve us (Griffero, 2017, p. xvii). To perceive an atmosphere is thus to be touched by one's surroundings, and thereby to be involved by them.

As radiators of atmosphere, quasi-things offer the designer potential as materials for design. As colourants of our spatial experiences, quasi-things co-shape our interior spaces. As environmental phenomena, they have the power to connect our interiors with larger systems outside. Because quasi-things are immersive and cannot be faked or simulated, they defy representation, and must be experienced.

However, although they cannot be easily communicated, quasi-things can readily be generated, and routinely are — such as the steam emitted from sewer grates, the rush of wind generated by an oncoming metro train, or the illusory effect of an opera set (Griffero, 2017, pp. 38-41). Making and experiencing them is the means of communicating them. For interior architecture, quasi-things can become quasi-materials, used as part of the interior architect's palette to compose overlapping, gradated interiorities of sound, light, heat and smell.

Mapping and Materialising Environments

From September through December 2016, the Environmental Technology class in the MFA Interior Design programme at Parsons took a hands-on approach to investigating the quasi-materials which colour our interior environments. Environmental Technology is a required class which both conveys essential knowledge in ecological design, and mechanical and electrical systems, and compliments the design studio. For the future interior architect, learning about environmental technology should not only share common-ground with other disciplines, but also ought to enable them to build one's own unique, alternative, and specific insight. Rather than being based in engineering or architectural concerns, we thus sought to structure the curriculum so as to emphasise the found conditions, immersive experiences, nature of interiority, materiality and atmosphere that characterise the spatial discipline of interior architecture.

Mapping Environments as a Way of Coming to Know the Quasi-Things of Our Environments

The first project sought to increase awareness of the non-visual, environmental phenomena that affect our spatial experience and comfort, and to consider how to materially capture and convey their effects. Students selected two phenomena to map in both indoor and outdoor spaces without recourse to the usual environmental measurement tools and representation methods. Rather students were asked to come up with their own methods for measuring and visualising light, wind, sound, heat, humidity and air quality, and reflect on their own sensory perception. They were encouraged to question extant methods (usually some form of colour gradient) of visually representing environmental phenomena. The mapping techniques were experimental, as some used three-dimensional forms of representation, others used audio and video to capture the temporal nature of ephemeral phenomena, and still others used a hybrid of two- and three-dimensions. In several cases, the techniques

John Stanislav Sadar

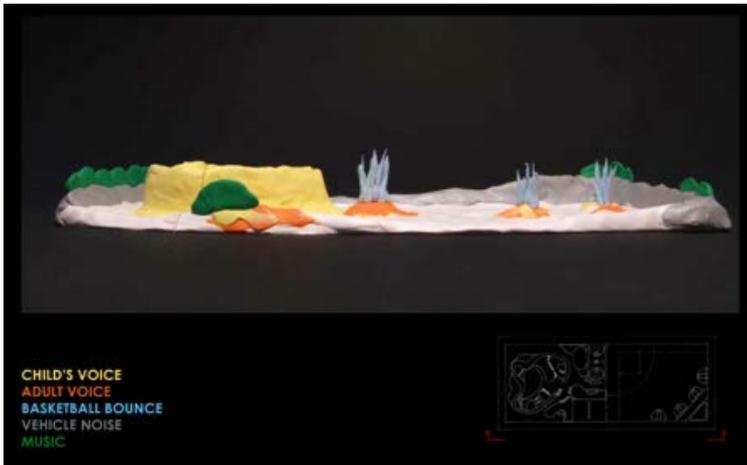of measuring and representing even became synonymous.

Figure 1
Mapping of
sound categories
and levels

Similarly, the ways of revealing and materially capturing environmental phenomena were as varied as the students themselves as they questioned how best to materialise and convey non-visual phenomena. For example, one project mapped categories of sounds to different colours and sound levels to heights in creating a coloured topography of modelling clay that suggested a possible interior spatial strategy [Figure 1]. Another used gelatine as a medium for communicating sound: the clear gelatine vibrated in response to sound, distorting the light passing through it in an animate display of light. In powder form, gelatine also served as a way of visualising air movement, as it scattered in the air in relation to the air velocity.

Other projects recorded air movement with timed photographs of a balloon or a blown film plastic shopping moving in the wind [Figure 2]. Still another project used word associations of odours which then became spoken words narrating a video of hair being blown by the wind to correlate smell and air movement. One project recorded interior and exterior surface textures by using pencil rubbings, and then overlaid a coloured filter to indicate whether these surfaces felt warm or cold. Yet another project mapped light and heat by leaving a glass prism and a frozen cube of red ink on a sheet of watercolour paper in a position for a defined amount of time, and then photographed the ink and the prism, capturing both the amount of melting and the refraction of the light [Figure 3].

Figure 2
Mapping of air
movement inside
(left) and outside
(right)

The diverse approaches taken to recording and mapping environmental phenomena revealed genuine material ingenuity. Moreover, though, in exploring the relationship between materiality and environmental reactivity and responsiveness, the students opened up a terrain linking the material imagination with the environmental imagination. Materials became resistors or conductors, carriers or amplifiers of environmental phenomena. Together the projects raised questions about whether tightly controlling light, wind, sound, heat, humidity and air quality in our built environments is always the best scenario or whether an alternative with greater reciprocity might be desirable. A slow-motion video of plastic bags waving wildly outdoors contrasted with similar video of the bags hanging limply indoors, to reveal a relative dearth of air movement.

Figure 3
Mapping of
heat and light
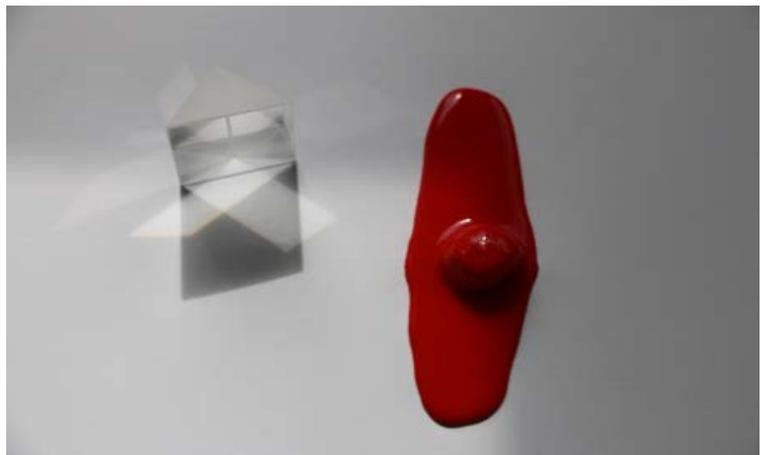
A continual rhythm of words described ever-changing outdoor smells in juxtaposition with a muted and monosyllabic description of starkly neutral indoor conditions. The methods of capturing and

mapping displayed an immediacy in their meaningfulness in ways that the abstraction offered by environmental measuring instruments do not. In some cases (such as with air movement), the methods developed to capture environmental phenomena even proved to be more sensitive than dedicated measuring devices, and thus more effective at capturing subtle changes in the environment. Furthermore, in mapping the interior relative to the outdoors, the projects revealed the relative experiential flatness of the interior environment in comparison with the fluctuating exterior.

Materialising Environments as an Approach to Making Graduated Interiorities

The material ingenuity and environmental imagination opened up in the mapping project was then further explored and elaborated in a project to materialise and spatialise an environmental phenomena with an installation at the scale of a human body. The final installations were located within a publicly accessible space within the university. As a constraint, the final installations had to be designed to be assembled in a half hour prior to the final presentations, and disassembled immediately following. Working again in teams of two, the students used their mapping project as a launch pad, and chose a phenomenon they had previously mapped for use as a quasi-material to foreground in the installation. The teams used the interplay of materials with the quasi-materials of sound, light, humidity, and air movement to create spatial experiences.

Figure 4
Fog threshold

Quasi-Materials and the Making of Interior Atmospheres

Some projects explored the experiential, atmospheric potentials of fog in interior environments. One such project proposed a threshold of fog. Through experiments with dry ice and water, one group of students probed the possibilities of fog as a carrier of light and revealed its tendency to sink in air. Atop a doorway-shaped, steel structure was a trough containing dry ice. When water was poured into the trough, the ice sublimated and immediately began to sink in the air, dropping through the doorway, thereby creating an ever-changing fog threshold that one could imagine as an entrance into a space, or an idea for a wall. Another project explored fog as a carrier of light. Inspired Hans Haacke's *Condensation Cube* of 1965, the students explored how fog creates visual depth when combined with electrical lighting. Using ultrasonic foggers, the students filled the inside of an acrylic cube with fog from a water reservoir. By applying filters of different colours and geometries to the outer surfaces of the cube, the students were able to control the shape and angle of light that entered the cube, and to experiment with different colour temperatures. The result was a device that one could imagine assuming different proportions to become an object in space, or even a wall or window.

Figure 5
Polyethylene
film sheet
undulating in
response to air
movement

Other projects sought to make the subtleties of indoor air movement more materially present. One group drew inspiration from Hans Haacke's *Blue Sail* of 1965, while mobilising their mapping of air movement using polyethylene blown-film bags. The students suspended a large sheet of lightweight, translucent polyethylene film using nylon monofilament in a public staircase. As warm air rose through the staircase, the translucent membrane began to stretch

and sag in response. The movement of passers-by further caused the film to lift and undulate unpredictably, from being taut as a drum to gently wafting back and forth like a flag in the breeze. Another project translating the vagaries of subtle indoor air movements into the visual spectacle of an ephemeral display of light. The students worked in two directions: on one hand, they experimented with how to harness and amplify air movements, and, on the other, they researched material technologies that would enable them to record these movements in light. This led them to imagine and construct a hybrid of a plumb-bob and ship's sail, using black string and rigid sails, weighed by an LED with focussing lens. They placed a square coated with phosphorescent paint on the floor, and as their construction moved in response to the air, the LED began to draw its movement in light on the phosphorescent square. Just as the drawing appeared, it began to fade, only to be redrawn anew.
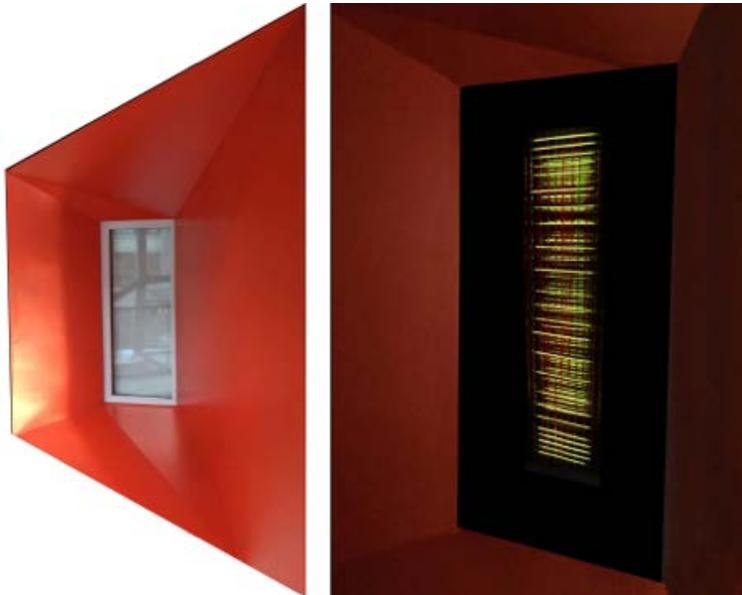

Figure 6
Infinity window
(right) and initial
condition (left)

The light itself became the focus of another project, which developed the concept of an infinity mirror into a slender, vertical window. Using one-way mirrors enclosed in black frames, the students experimented with light sources and geometries to understand how to control reflections and the resulting visual effects. They coupled their material research with an existing lite (or glazed opening) between the exhibition space and an auditorium. They arranged tightly-spaced yellow and red chemoluminescent glow sticks horizontally and vertically respectively in opposing layers

inside an infinity mirror the exact dimensions and geometry of the lite, effectively replacing it with a view into an infinite, luminous space.

The Quasi-Things of Interior Environments

Although interior architecture has largely been concerned with the manipulation of physical materials and things, consideration of the parable presented by Banham and the subsequent arguments of Zumthor, Pallasmaa, Böhme and Griffero finds that atmospheres and the quasi-things that radiate them are of paramount importance. To embrace quasi-things requires them to enter the palette of the designer alongside physical materials, as quasi-materials. Awareness and use of them point towards a possibility for environmentally reactive interiors, that far from buffering and neutralising environmental fluxes harness them for sensory delight (Heschong, 1979). Furthermore, it also suggests that when we design an interior space, we are designing a number of spaces simultaneously and which we inhabit through our senses: spaces of sound or silence, spaces of touch, spaces of scent, and spaces of vision. Quasi-materials thereby offer a trajectory for exploring multi-sensory perception vis-à-vis interior architecture practice.

Environmental technology teaching, within the context of interior architecture, thus cannot solely be about solving the problems of managing environments so as to render them neutral. Rather, it ought also to build an awareness of quasi-materials and the spaces they give rise to, like the thermal space of Banham's campfire, which are fundamentally different in character from those created by physical materials. Rather than being cohesive, contained, persistent and tangible, quasi-materials are gradated, ephemeral, intangible intensities, which exist only in the present. Because of this, to harness them requires a sensibility that cannot be readily communicated verbally or graphically, but rather requires immersive, experiential experimentation and learning.

The *Mapping* and *Materialising* assignments sought to introduce interior architecture students to consider air, light, sound and heat not merely as solutions to technical problems, but as media for spatial design. The fog projects create feelings of spatial intimacy by creating subtle gradations of visual depth and enclosure. Under the canopy of the plastic film project, space is continuously reformed by changes in indoor airflow. As the sails of the light pen project catch the air currents and begin to draw the ephemeral motion, it brings to mind the campfire, which carves space out of the darkness only to disappear when extinguished. The virtual

space of the infinity box creates a moment of visual depth and a connection to something beyond. In harnessing quasi-materials, the projects create interiorities that are fluid, gradated and provisional, exhibiting some of the continual change in environmental qualities that characterises the outdoors.

References

Banham, R. (1984). *The architecture of the well-tempered environment (2nd ed.)*. London: Architectural Press.

Bennett, J. (2010). *Vibrant matter: A political ecology of things*. Durham, N.C.: Duke University Press.

Binggeli, C. (2016). *Building systems for interior designers (3rd ed.)*. Hoboken, New Jersey: Wiley.

Böhme, G. (1993). Atmosphere as the fundamental concept of a new aesthetics. *Thesis Eleven, 36*(1), 113-126.

Böhme, G. (2006). Atmosphere as the subject matter of architecture. In P. Ursprung (Ed.), *Herzog & DeMeuron: Natural History* (pp. 398-407). Montréal: Lars Müller Publisher

Griffero, T. (2017). *Quasi-things: The paradigm of atmospheres*. Albany, NY: State University of New York.

Heschong, L. (1979). *Thermal delight in architecture*. Cambridge, MA: MIT Press.

Moxon, S. (2012). *Sustainability in interior design*. London: Laurence King.

Pallasmaa, J. (2006). An architecture of the seven senses. In S. Holl, J. Pallasmaa, & A. Pérez Gómez (Eds.), *Questions of perception: Phenomenology of architecture* (pp. 27-37). San Francisco, CA: William Stout.

Pallasmaa, J. (2014). Space, place and atmosphere: Peripheral perception in existential experience. In C. Borch (Ed.), *Architectural atmospheres: On the experience and politics of architecture* (pp. 18-41). Basel: Birkhäuser.

Pilatowicz, G. (1995). *Eco-interiors: A guide to environmentally conscious interior design*. New York: Wiley.

Rahm, P. (2005). *Décosterd & Rahm, Distorsions: Architecture 2000-2005*. Orléans: HYX.

Zumthor, P. (2006). *Atmospheres: Architectural environments; surrounding objects*. Basel: Birkhäuser.