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Placing the Body in Mixed Reality

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This chapter addresses notions of site and place in performance works that incorporate physical and digital environments. It considers how the site might be defined in such works and explores the implications for site-specific practice.

When I started writing this chapter, I had intended to examine the body in virtual reality, where it is subsumed into a three-dimensional virtual environment or substituted by an avatar in an on-screen virtual world. The separation of body and mind in virtual reality popularized by so much fiction of the 1980s and '90s (e.g. the novel *Neuromancer*, the movies *Bladerunner* and the *Matrix* trilogy) portrayed narratives of bodily displacement and alienation in sites that were defined as unreal. Yet over the past two decades, the practices and study of virtual reality have become increasingly absorbed within wider human-computer interaction perspectives that also address mixed realities, where the physical and the virtual come together to create hybrid experiences, as in mobile systems and ubiquitous computing (Ekman 2013). In these kinds of contexts, new media technologies are incorporated into everyday spaces and activities in such a way that they become a part of the lived environment. This might be as simple as using a sat-nav (satellite navigation system) in your car when driving to an unfamiliar destination, or texting a friend on your mobile phone to enable you to locate each other in a crowded place. It might be the visual augmentation of physical space with digital information or images using the camera and screen on your tablet computer or hand-held gaming console, or playing games on your television by controlling the digital avatar using Kinect body tracking on an Xbox. Or it might be more complex and immersive, as in the London-based performance company igloo's installation artwork *Vermilion Lake*, which this chapter will discuss in detail shortly.

These kinds of intersections between the physical and the digital highlight a philosophy of 'embodiment and situated action' (Coyne 2007) raising questions about experiences of both body and site. How does the physical body encounter a mixed reality environment? What is the nature of the digitally augmented or created site? Is there a hierarchy in experiences of physical and virtual? What is the role of movement in such environments? The moving body lies as the heart of these discussions, and dance has much to offer to other fields on the theorisation of the body and location. Consequently my focus in this chapter switched to a discussion of mixed reality, drawing together literature from performance, human computer interaction and cultural theory to begin to address these questions.

VISITOR

It is difficult to discuss the body and location in any form of reality without an example on which to draw for illustration, and this chapter takes igloo's installation *Vermilion Lake* (2011) as the vehicle for its debate. igloo performance company (dancer Ruth Gibson and computer programmer Bruno Martelli) combine movement with digital worlds to create performance / installation works that variously evoke site, space and place. Some of their recent works have been in the form of mixed reality installations in which visitors encounter environments to be experienced and explored. *Vermilion Lake* is one such piece, inspired by the artists' travels in the Canadian Rockies. In this gallery-based installation, the visitor enters the door of a full-scale replica of a trapper's cabin (see Fig. 1). Inside she finds the bows of a wooden rowing boat, including rower's bench and oars. The stern of the boat is missing, as if the boat has been cut in half. On the wall of the cabin behind the half-boat is a screen, showing a projected digital animation of the boat's stern floating on a virtual lake. The visitor can sit in the physical boat facing the screen and row the oars in the oarlocks. As she rows, on the screen she can see the virtual stern of the boat moving around the lake and waterways in the virtual landscape, so that it seems as if she is rowing the whole boat within that environment. (See Fig. 1) The scenery is

monochrome, although many visitors do not notice this lack of colour since the imagery is of murky water, snowy banks and mountains, dark trees and foliage. Throughout the journey there are traces of human habitation – a single light in trapper's log cabin, a lighthouse perched on top of dark rocks, a sunken village with a church bell tower protruding above the water, the ruins of wooden mine buildings from long ago. (See Fig. 2) The atmosphere is brooding, with a low sound track emphasizing feelings of chill and disquiet. There is a sense of something out there - 'a friendly or malevolent force', the hunter hunted, the tracker tracked, as the publicity describes it.[1]

FIGURE 1 NEAR HERE

FIGURE 2 NEAR HERE

Whilst inspired by the artists' experiences in the Rockies and their travels in other lands, *Vermilion Lake* is an imaginary place created as a digitally programmed environment. The topology of the landscape and many of the old wooden buildings are Canadian, the fishing village is Swedish and the sunken bell tower is Italian. Together they form a composite landscape that has a consistent mood and quality about it. The sun rises and sets at either end of a day that lasts about twenty minutes, and the weather varies from sunny to foggy to snowing at different times. At night the stars and the moon shine brightly overhead.

Upon entering the installation the visitor is given a map of the waterways to help her explore the virtual landscape. The waterways are quite extensive and it would take several hours to row around the whole environment, so the artists included a few shortcuts by which rowers might teleport between locations (although the visitor is not told about this in advance and may or may not discover the teleports). Rowing requires considerable effort due to a force feedback system on the oars. This system engages springs (from exercise bicycles) when the oar blades are dipped down into the virtual water and it releases the springs with the blades are lifted up out of

the water. Rowing can result easily in blisters and a sore back, just as one might experience when rowing a physical boat across a physical lake. When the visitor sits still, the virtual stern rocks gently on the water. When she rows, the boat appears to move with the sound track adding the splash of the oars and the prow travelling through the water. The visitor cannot get out onto the banks or jump into the water, but the obvious cold and the brooding atmosphere tend to offer discouragement from such actions anyway. There is a gap of a metre or so between where the physical bows end in the room and where the virtual stern begins on the screen, so their connection as one boat is implied rather than literal. (See Fig. 3) There is a button on one of the oars that allows the rower to swivel her viewpoint, so that she can look around at the landscape through 180 degrees each way to the left and to the right. But always the visual image on the screen locates the viewer's perspective as seated within the boat.

FIGURE 3 NEAR HERE

Multiple visitors can enter the installation and stand or walk around the boat as well as sitting in it. It is possible to fit two people side by side on the rower's bench so that both can row. However in this chapter I am concerned with how the installation is encountered by a single visitor, in order to explore how a series of conceptual frameworks can shed light on issues around site specificity and movement in mixed reality. Whilst this performance work might not be considered as incorporating dance movement in a formalised or codified sense, movement is at the heart of the visitor's engagement with the physical and virtual components. The resulting choreography is central to the discussion. I will argue that the piece *Vermilion Lake* inspires a sense of place that is unique and specific to the individual visitor's encounter with the installation, since it is fundamentally *real*. I explore how the choreography of the encounter with that site is implicit within the design of the virtual environment and within the method of encounter (rowing), and crucially within the connection between these two elements. Firstly I am going to consider some definitions of site-specificity in relation to *Vermilion Lake*. Then I

will examine notions of mixing realities and address the visitor as an embodied agent within the mixed reality site. Lastly I will offer some thoughts on relationships between the body, the virtual and the real in mixed reality and consider some of the implications for site-specific dance practice.

DEFINING SITE-SPECIFICITY

In *Vermilion Lake*, the physical location is the art gallery while the virtual landscape is a representation of the phenomenological qualia (or essence) of the Canadian Rockies as experienced by the artists. The design of the work draws upon their subjective responses to the physical landscapes that they encountered on their travels. Indeed it is not so much a representation - since there is no specific lake to represent - as a re-presentation of the affective experience of being in that place. The installation aims to capture the pre-cognitive, embodied engagement that the artists felt in the Rockies and present it as a parallel experience for the visitor's sensing body in the virtual environment. Yet can it be defined as site-specific?

In her introduction to *Performing Site-Specific Theatre: Politics, Place, Practice*, Joanne Tompkins (2012) returns to Mike Pearson and Michael Shank's definition of site-specific performance: 'They are inseparable from their sites, the only contexts within which they are intelligible. Performance recontextualises [sic] such sites; it is the latest occupation of a location at which other occupations – their material traces and histories – are still apparent' (p.2). This definition assumes fundamentally that site-specific performance re-contextualizes the site *from within that self-same site*, i.e. it inscribes into or over the existing site as a palimpsest. In what way, then, might *Vermilion Lake* be considered site-specific when the visitor encounters the work in an art gallery, and indeed there is no such actual site in the world anyway?

In her book on site-specific art and locational identity, artist and theorist Miwon Kwon (2002) offers a historic overview of the development of site specificity that updates and broadens the Pearson and Shank definition. She proposes that in contemporary art there are many non-physical things that can be deemed to function as sites: 'cultural debates, a theoretical concept, a social issue, a political problem, an institutional framework (not necessarily an art institution), a neighborhood [sic] or seasonal event, a historical condition, even a particular formation of desire' (p.28-9). She exemplifies this through a description of Mark Dion's installation artwork titled *New York State Bureau of Tropical Conservation* (1992), which consists of a neat stack of materials and products from the Orinoco River basin next to a door on which the given title is painted. She explains that the rain forest (the source of material and inspiration for this work) is linked to the projected site of effect (the discourse on nature), 'yet does not sustain an indexical relationship to it' (p.29). She argues that the site is now 'structured (inter)textually rather than spatially', resulting in the transformation of the operative definition of site 'from a physical location – grounded, fixed, actual – to a discursive vector – ungrounded, fluid, virtual' (p.29-30). In *Vermilion Lake*, the primary source of the work is deeply rooted in the artists' site-specific experiences of the Rockies. The projected site of effect is the affective experience of the visitor, sharing the qualia that the artists felt. The link between the original site and the re-presented virtual environment is not indexical in that there is no direct cognitive mapping between them, since the virtual site is invented. However there is an underlying phenomenological site specificity that permeates the work.

Still there is the issue of the multiplicity of this artwork, since there is no original version of the digital landscape (light projection and sound) and it can exist in multiple locations simultaneously with no connection between its manifestations. Kwon can accept this in her flexible definition of site, but it is useful also to consider approaches specific to the particular technology employed in *Vermilion Lake*. Mitchell Whitelaw, writer and new media artist, examines relationships between the digital and the material in new media artworks through his

theory of ‘transmateriality’. He claims that the immaterial nature of digital information is actually an illusion, since ‘the digital is always specific, always subject to the local conditions of its instantiation’ (Whitelaw 2013: 230). He explains that this illusion of digital immateriality is propagated by careful programming of ‘tolerance and thresholds and the active interventions of error correction. Without these mechanisms, a million entropic, material variations would creep in – dust motes, temperature variations, mechanical wear’ (ibid). Programmers have to work to eradicate all of the natural interferences of the physical hardware and environment in order to make each projected image, each sound, appear the same every time. In digital image projection sometimes errors can creep in, causing anything from odd little glitches in the image to full-scale computer crashes. So the achievement of identical form in each manifestation (or instantiation) is an engineered feat rather than a feature of the digital per se. The process of converting electrical energy and computer coding into physical arrangements of light projection and sound vibrations is known as ‘transduction’ – the conversion of energy from one form into another. A specific physical instance of the virtual lake is created for each visitor to each gallery, with electricity and computer coding transduced (converted) into projected images and sounds that this particular visitor sees and hears. These physical lights and sounds are experienced in combination with the other physical elements of the trapper’s cabin, the rowing boat and oars. Thus each instantiation of the lake is created physically anew as a specific environment to be encountered by each visitor – a kind of Rockies-inspired Garden of Eden.

Walter Benjamin in his discussion of art in the age of mechanical reproduction attended to the aura of the original artwork and the relationship between it and the individual viewer. He noted the absence of aura from mass-produced work – reproducible in identical form but devoid of the patina of originality in its multiple existences. Yet if we return to Kwon’s definition of site specific work as having a site of effect – in this case the affective experience of the visitor in *Vermilion Lake* – then that site is specific to the visitor’s individual engagement with the art work. More than that, it is specific to the visitor’s engagement with that particular physical

instantiation of that artwork, with any small anomalies that have arisen during the transduction process in spite of tolerance programming. The work also has physical elements that may be in slightly different relationships to each other depending upon the gallery in which each version is constructed. The piece is not complete until the visitor engages with it and navigates her personal route through the virtual waterways. The presence of the visitor's sensing, moving body in the artwork is the critical factor in its specificity as a site, as I will explain further shortly.

MIXING REALITIES

Firstly it will be helpful to consider in more detail how the visitor engages with mixed reality environments. In 2003, Bolter and Gromala wrote a book called *Windows and Mirrors*, in which they argued that 'every digital artifact [sic] oscillates between being transparent and reflective' (p.6). By this they meant that every such artefact delivers an experience to the user (a window through which the user can reach something or somewhere else), but inevitably that experience is bound up in the functionality and aesthetic of the interface (the mirror in which the user is aware both of the processes used to produce the artefact and of herself engaging with those processes). Bolter and Gromala argue that the user should be aware of both the window and the mirror in order to appreciate the experience fully. This argument appears to posit the visual as the primary mode of encountering digital artefacts in an assumption of the desirability of cognitive engagement. The body is relegated to the role of a mechanism via which interaction may be triggered. In the *Wooden Mirror* (Daniel Rozin, 1999) for example, the image of the visitor's body is 'seen' by a camera in the centre of the artwork and processed via a digital interface to be reflected as an image in the angling of the hundreds of small polished wooden facets that make up the 'mirror' face. The *Wooden Mirror* mimics the body's shape, and thus it encourages the visitor to move so that her movement causes the many facets to shift their angles to match her changing profile. However the movement is simply a means to control the visual

interface. I propose that digital artefacts designed as mixed reality environments offer a third mode of engagement – as a door. The door is accessed by the experience of the moving body within the artwork, offering an active counterpart to the otherwise inherently visual/cognitive orientation of the reflective/transparent binary. Through this door, I propose, potentials embedded in the virtual become real and thus the conceptual site is concretized in the visitor's experience of moving within it.

Mixed reality applications are those in which the user 'interacts not only with the computer, but also with other aspects of the physical world.' (Bolter, MacIntyre, Nitsche & Farley 2013: 335). In such environments, Bolter *et al* explain, there is no attempt to conceal the technology. Instead the graphical and communications interfaces are openly acknowledged and 'typically do not disappear form the user's conscious view' (ibid). The unconcealed interface highlights the position of the body as a part of the interface and mitigates against the body's own tendency towards absence, as promulgated in Bolter and Gromala's binary of windows and mirrors.

In *Vermilion Lake*, the contrast between the screen-based virtual world and the physical wood of the oars, prow and seat of the rowing boat is not disguised. The completion of the rowing boat in the virtual world is not designed to map directly onto the physical boat, since the first is two-dimensional and the second is three-dimensional. However Figures 1 and 3 show that the stern falls within the rower's field of vision in the appropriate direction to construct the concept of a single boat (which might still be defined as a site in Kwon's terms). Bolter *et al* (2013: 335) propose that 'players' or users of mixed reality environments: 'understand their experience in terms that Auslander defines as the liveness of rock concerts and other mediated productions. Technological mediation does not destroy or invalidate liveness for them; instead, the creative use of the technology contributes to the liveness of the experience.' It is the user's engagement with the physical world in conjunction with the digital that grounds the experience in a particular space.

Mixed reality spaces are often defined as places where data and communications technologies intersect with or overlay physical spaces, highlighting a philosophy of 'embodiment and situated action' according to digital media specialist Richard Coyne (2007). Computer scientist Steve Benford and performance theorist Gabriella Giannachi (2011) maintain that it is the variations in communication that locate the individual in the contingencies of the everyday world. Artist and academic Emily Puthoff disagrees, criticising what she describes as the 'proliferation of new technologies' in everyday life by claiming that 'the notion of "place" has become so multi-faceted it shimmers' (2006: 76). She argues that the ability to access excessive quantities of information about a place whilst being in that place reduces it to a 'non-place', which she defines by quoting Augé: 'a space which cannot be defined as relational, or historical, or concerned with identity' (ibid). For Puthoff, the excess of conceptual information overrides and overloads the lived experience, resulting in 'a condition of perpetually scanning the horizon in the distance whilst marooned on the isle of everywhere' (p.77). Benford and Giannachi appear to be at odds with Puthoff, but these conflicting views do not necessarily arise from a simple split of artists versus computing specialists. Indeed Puthoff's perspective might seem to disagree with the Pearson and Shank definition of site-specificity, which promotes the palimpsestic inscription of the site with 'material traces and histories' to be experienced by the spectator. Perhaps the locus of conflict is the particular ways in which realities are mixed and bodies are engaged.

In igloo's work, physical and digital spaces have a direct relationship, in that they are both encountered and experienced by the visitor's body as a mode of travel in and negotiation of those spaces. The spaces might not blend perhaps as readily as in the overlaying techniques of augmented reality or communications data and physical spaces, since they demand an element of the lived indexical relationship between physical and virtual. The physical and virtual halves of the boat correspond through the experience of sitting and rowing, and the movement of the

oars is enhanced by the physical force feedback of the bicycle springs coinciding with the movement of the virtual boat across the virtual lake. This lived relationship is more challenging to achieve for the designer and requires more embodied commitment from user than the purely conceptual mapping of information to spatial location or the visual perception of augmented reality. However it promotes an experience that equalizes embodied engagement with the physical and the virtual elements through deep interrelationships between the two that are grounded in movement. New media philosophers Jeff Malpas (2009) and Mark Hansen (2006) have both independently proposed that the key factor in defining the 'real' is the lived experience rather than whether the 'reality' in question is physical or virtual. If this is the case, then the representational status of the virtual environment is less critical to the experience of the visitor than the lived experience of mixed reality. The acknowledgement of Bolter and Gromala's window/mirror flickering that was an important aspect of the disinterested viewing of digital visual artworks is overshadowed by the embodied practice of real, lived space. Shall we open the door now?

OPENING DOORS

In *Vermilion Lake*, the visitor enters the life-sized wooden trapper's lodge and takes a seat in the rowing boat. It is a fair-sized boat and it takes physical effort to row. The body moves forward and backward with each heave of the oars, the arms reach and retract, but that effort is rewarded by the virtual part of the boat skimming smoothly across the surface of the lake and the beautiful, eerie landscape drifting past. The visitor hears the oars splashing gently and the virtual water swishing audibly past the prow, accompanied by occasional birdsong and an atmospheric soundtrack.

In the 1950s, psychologist James J Gibson was interested in the visual perception of living creatures but he became frustrated with the separation of seeing and acting that was prevalent in

his field at the time. He developed a theory that connected the two at a fundamental level, which became known as 'ecological psychology'. Critical to this was Gibson's concept of 'affordances', which are those possibilities for action that are available to the animal (or human) in a particular environment (1986: 127). For example, in order to leave my house, I open the backdoor but my cat exits via the cat-flap. The environment offers those affordances to each of us, but not to the other. (I cannot fit through the cat flap and my cat cannot open the door.) Paul Dourish (2004) explains that Gibson's affordances were taken on board by the human-computer interaction community in the 1990s, as it became apparent that humans using virtual reality responded better when the virtual environment offered similar affordances to the physical environment. A key factor in the experience of *Vermilion Lake* is the mapping of affordances for the visitor. When she rows with the oars, the boat travels through the water and she watches the landscape move past her as she travels.

Cognitive scientist Mel Slater (2009) describes a phenomenon in virtual reality called 'place illusion', where there is 'a strong illusion of being in a place in spite of the sure knowledge that you are not there'. But importantly Slater claims that the experience of place is *further* enhanced by the 'plausibility illusion' brought about by the direct relationship between the user's physical movement and the uncontrolled yet direct responses in the virtual world, i.e. as she rows, the boat appears to move, she hears the sound of the oars and the prow travelling through the water, and she sees the scenery change. Objects that are further away pass behind objects that are closer, giving a sense of perspective and distance that is familiar within our understandings of the physical world. Movement is fundamental to this illusion, as it is only by physically rowing that the correlating responses in that virtual environment can be mapped and evaluated against the physical experience of moving. The particular design of *Vermilion Lake* encourages movement, since the boat is set up to be rowed, and the physical effort of rowing is simple to map to the motion of the boat through the virtual lake. Movement counters the strangeness of the physical/virtual boat, the plywood interior of the cabin, the occasional glitches in the image,

as it is always possible for the visitor to orientate her physical movement within the virtual environment. Gibson and Martelli want to reveal the mixed reality experience to the visitor and to avoid unquestioning immersion – thus foregrounding the mirror as well as the window in Bolter and Gromala's terms. But as Bolter *et al* explain, this highlighting of technological mediation does not necessarily affect the liveness of the experience. In fact it encourages appreciation of the embodied nature of the engagement, as it highlights the body's movement as a key aspect of the interface in the plausibility illusion – the key to the door by which the visitor enters and negotiates the environment as a mixed reality.

JOURNEYING

In *Vermilion Lake*, the process of negotiating or journeying on the waterways is both a means by which the visitor can engage with the mixed reality environment and a conceptual end in itself. Getting lost and finding one's way in that alien landscape are central to the phenomenological qualia underpinning the site-specificity of the work. De Certeau's (1988 [1984]) discussion of place and space assists in exploring this further. He describes a 'place' as being 'constituted by a system of signs', a conceptual location; whereas a 'space' is constructed in an individual's subjective experience of being in it and moving through it. These two perspectives are not mutually exclusive, as artist and academic Lone Hansen (2009: 7) explains: 'a location can be both an objective or almost factual notion as well as a "container" of subjective and felt experiences.' In *Vermilion Lake*, each visitor's journey is her own, and it is unlikely that anyone else will undertake an identical journey around the lake or through the waterways. In that sense, the computer-coded environment is pregnant with potential pathways (affordances of travel), some of which are actualized in the journeying of the individual visitor. The lake in *Vermilion Lake* is not a physical place - it is a re-presentation of an imaginary place - but it becomes a space in de Certeau's terms through bodily encounter.

Ingold's process of wayfinding is critical to the practice of space as it occurs here. He describes how finding one's way 'is tantamount to one's own movement through the world […] we know *as* we go' (2000: 239). The visitor to *Vermilion Lake* can navigate using the map of the waterways that was handed to her on entry to the installation, or she can find her way by exploring. De Certeau's advice is that navigation without the map enables a 'blind' engagement that embeds the traveller within the environment (1988 [1984]: 93) and allows her to open her 'sensorial apparatus' (Hansen 2009: 20). The map, according to de Certeau, imposes strategies that countermand such situatedness and distance the body from its environment. The process of rowing makes it difficult to look at the map at all times, since it takes both hands and some physical effort to make progress through the water. So the visitor is required to choose either to find her way 'blind' or to switch between blindness and the map, as it is all but impossible to maintain focus on the map as the primary strategy. Equally the cold beauty of the environment together with the brooding sense of something out there, friendly or otherwise, attracts the eye to the landscape on a regular basis. Inevitably, then, the visitor comes to know the environment by seeing and remembering the contours of the earth, the landmarks, and the unfolding vistas as she travels.

Wayfinding is a process leading towards an immersive experience of a landscape, but it is not a full immersion since we come to know the place as a series of temporal flows, journeys through space and time. The process of journeying is one of familiarization, and the rhythm of rowing - its repetitive movement and the sound of the water – metes out time as the visitor travels through space. The more we engage in finding our way through the environment, the more we are able to orientate ourselves in that environment, building up a series of vistas and transitions that will come to intersect if we travel repeatedly through it. This self-orientation is a subjective experience that develops a sense of space in de Certeau's terms through the practice of being in that place. I noted earlier that Slater's plausibility illusion was dependent upon the environment behaving in a predictable fashion in response to the visitor's movement within it, e.g. landmarks

that are further away moving behind those that are closer. This illusion provides the sense of perspective that allows the visitor to feel as if she is located within a three-dimensional (3D) environment. However, what is more important than mere 3D-ness is the depth of potential journeying within the environment, which is not so much an illusion of location as a sense of being present. In *Vermilion Lake*, the particular digital instantiation of the lake is encountered by the visitor, whose bodily presence activates the subjective 'vectors of direction, velocities and time variables' through her movement within it. Her embodied practice of the potentials of that virtual place brings it into focus as a space, the site of a particular set of phenomenological qualia – the site-specificity of this installation.

IN REALITY

Earlier in this chapter I posed the question about whether there is a hierarchy in experiences of physical and virtual elements in a mixed reality site. The discussion so far suggests that the physical engagement of the body is central to the experience of mixed reality environments in site specific performance. I have explained that mixed reality acknowledges both physical and virtual elements as being present in the same space and makes no attempt to conceal their presence or their differences. However both Gibson's affordances and Slater's plausibility illusion would seem to imply that the more closely the virtual elements correlate to the physical world, the more the visitor is able to accept those elements into her embodied experience. The visitor's movement highlights that correlation (or demonstrates it to be missing). Hence it might appear that there is a prioritization of the physical over the virtual in the embodied experience of the site. Yet the argument posited by de Certeau and supported by Ingold is that the matter of the physical mapping of the 'place' is a cognitive process, whereas the subjective and felt experiences of being there are fundamental to the establishment of a sense of 'space'. Those experiences are gathered through embodied practice but they are not dependent upon physical

elements necessarily. Instead they are concerned with the unfolding of embodied engagement with virtual and physical elements alike within the environment.

The distinction between physical and virtual needs further unpacking to aid in this discussion. Complications arise in the English language because of a tendency, developed in early discussions of new technologies, to conflate the terms 'physical' and 'real' when talking about the physical/virtual binary. Thus the real is often assumed to be physical, and therefore by extension not virtual. More contemporary philosophers have chosen to confound that assumption, often by divorcing the 'virtual' from the digital. Malpas (2009) has proposed that the virtual is a sub-set of the real, where the real is constructed through embodied experience. Taking this back to the discussion of de Certeau, the visitor's subjective experience of *Vermilion Lake* renders the lake 'real' in her experience through her embodied practice of that space and her sense of the qualia of it, despite the fact that the installation incorporates physical and virtual elements and the lake itself is virtual.

In contrast to this, digital communications theorists Adriana de Souza e Silva and Danield M. Sutko (2011: 31) describe how Deleuze appears to conflate the terminology: '[the Deleuzian] perspective does not oppose virtual and real, for physical spaces become folds within the virtual. If the real can be unfolded into different possible realities, the virtual and the real are actually synonymous and reality, or physicality, becomes one of the faces of virtual.' Deleuze's 'virtual' refers to something that has the potential to become 'real', rather than something that sits in binary opposition to the physical. This argument brings us to the same place as Malpas, but from the other side, so to speak. Effectively the virtual holds the potential for many possible realities. The concept of potentiality negates the difference between physical and virtual because nothing is experienced as real until reality is in the process of becoming through embodied experience. In *Vermilion Lake*, the visitor's experience of the 'real' is fundamentally grounded in the act of rowing on the lake. It is that embodied practice that produces the reality of her

experience of that environment, regardless of which elements are physical and which are virtual. The open acknowledgement of the differences between physical and virtual that is typical of mixed reality helps to detract from those differences, as the lack of conceit allows the visitor to focus on her own subjective experience of what she does, sees, feels in that space.

Indeed Gernot Böhme (2013: 462) declares that it does not matter whether a projected space such as the environment in *Vermilion Lake* is 'the product of thought or is derived from reality'. He argues that it is incorrect to call virtual spaces 'virtual' just because they simulate or represent reality. To him it would be of no consequence whether the lake is a representation of a specific lake in the Rockies or an imagined lake. It is only at the point when that representational space entwines with the space of a bodily presence that it becomes truly virtual in the Deleuzian sense, as then the space carries potentials (affordances, perhaps?) to be experienced as real. So the representational space of the virtual lake entwines with the bodily presence of the visitor, providing the potential for the visitor to row on that lake and thus to experience it as 'real'. The three-dimensional illusion of the re-presented lake becomes actualized by the potential for the body to journey on it – to row towards the lighthouse, for example. I propose that this actualization or real-ization process is the moment at which *Vermilion Lake* is most clearly defined as site-specific, as it is the point of affective experience when a passage materializes between the original Canadian Rockies locations that inspired the artwork and the site of the visitor's embodied engagement.

THE VISITOR

In *Vermilion Lake*, Gibson and Martelli do not wish the visitor to feel at home or to become comfortable in the virtual environment. There is always a brooding sense of something out there. The visitor is constantly reminded that she is just that - a visitor in an alien landscape. The process begins with the title of the overall work, and then continues through entry via the

tracker's cabin (a temporary dwelling place), the visual impact of the cold unforgiving landscape of the lake and the uncompromising mix of cheap plywood and digital projection. This is a mixed reality, where physical and virtual elements are openly acknowledged, rather than a cosy immersion in a digital world. But despite the alienation implicit in so much of the design, there is still a strong sense of site underlying the whole installation. The visual representation, the sound and the design of the experience are deeply imbued with the artists' impressions of the Rockies. *Vermilion Lake* becomes a place that the visitor encounters, experiences, however briefly, within her particular instantiation of the installation. It is a space that she remembers traversing and discovering, and there are likely to be blisters on her hands or aching muscles across her shoulders tomorrow to remind her of the physical act of rowing across a lake and her real encounter with that virtual space.

Vermilion Lake enables the visitor to encounter the artwork as a window, a mirror and a door, since it highlights the interface whilst also using the visual aesthetic of the landscape and the centrality of movement to engage the visitor in the experience of the work. Three-dimensionality is not defined by the illusory depth of the objects on screen but by the depth of potential journeying for the wayfaring visitor. It is the body of the visitor that unlocks the door to these affordances, these potentials in the virtual landscape that become real through her embodied experience in the mixed reality installation.

There is a risk that virtual and mixed realities could be ignored or avoided by site-specific choreographers and artists, as such environments can be seen as essentially disconnected from traditional concepts of 'site' in Pearson and Shank's terms. It is rare also to read about this area critically, except in relation to concerns that site specificity will be mislaid on 'the island of everywhere' (Puthoff 2006). However this chapter has shown that mixed and virtual realities are no less able to function as sites if we are willing to accept the definition offered by Miwon Kwon. Indeed it seems that more contemporary definitions are essential now, as previous

definitions were devised for a world in which the blending of digital and physical was less possible and less prevalent than it is today.

Particularly in mixed realities, the lack of conceit around the nature of physical and virtual elements not only enables the body to be present but it actually demands that presence, since the body is the experiential interface through which virtual and physical become 'real'. In some ways the body is less able to absent itself in these kinds of environments than it is in those spaces where we are more practised at being and thus we are more at ease. Perhaps the dis-ease of mixed reality is not unlike the experiences of audiences at early 1960s environmental theatre, when their physical bodies were placed for the first time in the same space as the performing (virtual?) bodies of the dancers and actors. In time it is likely that we will become practised at being in mixed and virtual realities, but for the present moment there is much still to be explored and much to be discovered about dancing and choreographing in these new sites.

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NOTES

1. See igloo's web site at http://www.igloo.org.uk/Visitor1.html (accessed 17 October 2013)

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