



## Rethinking VR: Key Concepts and Concerns

by Char Davies

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## Abstract

The author calls for a subversion of conventional approaches to VR on the basis that they reinforce an outdated dualist worldview. She redefines immersive virtual space as a medium for de-habituating perception and re-sensitizing us to our own being in the world.



**Char Davies, *Forest Stream*, from *Ephémère*, 1998.**

**Digital image captured in real-time through head-mounted display during live immersive journey/performance, 1998.**

In view of the grim prospect of the twenty-first century, we are compelled to ask how critics of culture, philosophers, and artists will deal with technologies. How do they contend with expansionist ideology, and the accelerated elimination of diversity and of singularities? How do they resist or act? Now, in a world where the notion of space has been completely changed through electronic simultaneity, where the computer appears to go faster than the human brain, or where "virtual reality" replaces "reality", how do philosophy, critical theory, or artistic practices deal with those shifts? (Verena Andermatt Conley, *Rethinking Technologies*)

As an artist working with "virtual reality", I am necessarily engaged in the process of formulating a response to Conley's queries through my own ongoing practice, which includes the immersive virtual environments *Osmose* and *Ephémère*. (For readers who are unfamiliar with these works, *Osmose* (1995) and *Ephémère* (1998) integrate full-body immersion via a stereoscopic HMD, navigation based on the participant's own breathing and balance, interactive 3D digital imagery characterized by semi-transparency, and interactive 3D localized sound. *Ephémère* also employs gaze and participant proximity/speed as an interactive mode.)<sup>[1]</sup>

## 1. VR as a Reinforcement of the Cartesian Worldview

As progeny of the Western-military-industrial paradigm, the technology associated with so-called virtual reality is anything but neutral. The origins of 3D digital technology lie deep within the Cartesian philosophic tradition, a tradition whose dualistic privileging of mind over body, male over female, and human over "nature", has arguably contributed to an historic devaluation and objectification of the body, women, and animals, and to the ongoing plunder of the natural environment as a resource for profit and human consumption.<sup>[2]</sup> Given the technology's cultural origins, it should not be surprising if most of the conventional design metaphors (spatial, visual, *and* interactive) used in virtual reality and other digital constructions reflect the techno-scientific paradigm, which Henri Lefebvre in *The Production of Space* (1991:408) identifies as the reign of King Logos:

King Logos is guarded on one hand by the Eye—the eye of God, of the Father, of the Master or Boss—which answers to the primacy of the visual realm with its images and its graphic dimension, and on the other hand by the phallic (military and the heroic) principle, which belongs, as one of its chief properties, to abstract space.

By default, 3D digital technology not only reflects but *reinforces* such values. In this context, the striving for mimetic representation that characterizes the field can be interpreted as a reinforcement of Lefebvre's supremacy of the Eye. Similarly, conventional 3D computer graphic techniques that rely on the xyz coordinates of Euclidian space and artificial linear perspective embody a particular *concept* of space, which Roger Jones in *Physics as Metaphor* (1982:61) describes as a compound metaphor embodying all our concepts and experiences of separation and isolation. According to Jones, the laws of perspective and geometry are a "codified summary of our normal experience of alienation, unique identity and unrelatedness", all of which have been "abstracted, externalized, and synthesized into the cold, empty void we call space".

The conventional digital representation of reality as a collection of separate solid objects in empty space serves to reinforce an objectifying and dualist stance towards the world: in doing so, it not only reaffirms our separateness but also our stance as Master of all we survey. Most user-interface techniques associated with interactive digital media conventionally rely on hand-based interface devices such as joystick, mouse, keyboard or game console: by encouraging users to "do this *to* that", such methods reinforce controlling and

dominating behavior. All of these design techniques, whether graphic or interfacial, uphold a culturally-biased view of the world, in effect reducing it to a "standing reserve" of things for human use, to use a phrase by Martin Heidegger. Indeed, the conventionally designed virtual environment—where there is the illusion of total control, the body (i.e., our aging mortal flesh) is absent, and the human subject is reduced to an isolated and omnipotent view-point (and cyber-hand) manipulating hard-edged objects in empty space—can be considered the epitome of Cartesian desire, or as Richard Coyne (1994:68) has pointed out, a "literal enactment of Cartesian ontology".

In "alt.civilization.faq: Cyberspace as the Darker Side of the West", Ziauddin Sardar (1996:34) describes cyberspace and VR as "the product of the collective consciousness of Western culture" issuing from a techno-Utopian ideology ripe with subconscious perceptions and prejudices. These prejudices include the gender bias of a phallo-centric culture, not only in terms of privileging sharply-focused sight (Lefebvre's eye of God, the Father), but also interface techniques whereby, especially in games, the traditionally *masculine* will to master is rewarded. Such bias also includes the desire to leave the body behind.[3]

## 2. The Challenge: Rethinking Technology

I first wrote about the implications of VR technology in 1991 in a text titled "[Virtual Nature](#)", in which I decried VR's reinforcement of dualistic attitudes and raised the challenge of using the technology alternatively, as an *antidote*, in terms of reaffirming our embodied participation within the natural world rather than our instrumentally objectifying conquest of it. I was, in effect, calling for a rethinking of the technology. And, inseparable from that rethinking, a reconsideration of our conventional attitudes towards our own being and becoming in the world.

In her anthology *Rethinking Technologies*, Verena Andermatt Conley (1993:ix-xiv) writes that the post Renaissance surging of instrumental technology coincided with a Heideggerian *techné* or means that reduced the three-dimensional world to a two-dimensional diagram, instituted a separation between subject and object and inaugurated the "quest of the rational, self-possessed subject that soon expands and colonizes." This stance, she says, led the West to develop a *techné* in the sense of an "instrumentality that takes over, arrests, or *enframes* what it desires to manipulate or contain".[4]

Conley emphasizes however that "rather than simply lamenting the loss of humanness through technology", we should try to *rethink* the subject "in the wake of a becoming technological of the world". In this context, she asks: "how do we exit from a simple dialectic and enter into a changing world, yet in such a way that "becoming" remains a term reserved for humans and/in the world?" She writes that it may be possible to rethink technologies in terms other than enframing, emphasizing that it is necessary to not only go through, but *beyond* Heidegger's thinking in terms of the domination of nature and loss of humanness through technology to an exploration of its transformation of subjectivities. Technology, she writes, can reveal the uncertainties of human thought, and can not only alter human subjectivities but "paradoxically decenter humans' position in the world".

Conley suggests that "without simply ignoring or simplifying technologies, we now need to emphasize the necessity of thinking the subject not only its relation with other subjects, but also *in*, and *with*, the astonishing complexities of, the world" (1993:89). In this context, she writes (xi-xii) that following the chaos theory of contemporary physics, we must go beyond the Newtonian and mechanistic view of nature as "inert and passive, to be conquered and acted upon", suggesting that concepts such as pattern and randomness, and irreversible time, may encourage scientists towards introducing ethical dimensions in their disciplines.

Ecological dilemmas, she emphasizes, prove that "the world cannot be reduced to a scientific object, that it escapes total mastery, and that other ways—or *techné*—of approaching it must be essayed if humanity is to sustain its life".

In my own work, I have attempted to resist the cultural biases inherent to digital technology in order to communicate an alternative sensibility, one that is rooted in my own bodily experience and intuition, of an osmotic intermingling between interior and exterior, self and world, of a nature in whose flows we are inextricably webbed. My research is founded on the premise that VR technology and the medium of immersive virtual space can, *if its conventions are effectively subverted*, serve as a means of facilitating a renewed, refreshed, perception of our place in the world.

The desire to prove that such subversion is possible led to the making of *Osmose* in 1995 and subsequently, *Ephémère*. As such, these works were deliberately intended to serve as "lighted lamps in a dark corner" so to speak, in terms of going beyond my own personal artistic agenda to demonstrate to others in the field that the medium of virtual reality could indeed be used for purposes other than reinforcing the dominant and conventional worldview. Lefebvre calls for the production of "counter space" as an alternative against the homogenizing effect of the absolute space of Western metaphysics and science: I consider my virtual environments as steps towards producing such a space.

### 3. Redefining Immersive Virtual Space

What I am trying to translate to you is more mysterious;  
it is entwined in the very roots of being,  
in the impalpable source of sensations.

(Gasquet, *Cézanne*, quoted by Merleau-Ponty, "Eye and Mind")

My envisioning of the medium of immersive virtual space, my definitions of what it is and what it could be, are very specific. In order to more clearly convey this vision, I want to define certain concepts and concerns. In my work, and indeed, in my entire conceptualization of the medium, the desire to articulate these concerns has proceeded and, in effect, driven my exploration of the form.

Before proceeding further, I want to point out that in relation to my own research I avoid using the phrase "virtual reality": instead I prefer *immersive virtual space*, *immersive virtual environment*, or sometimes, for brevity's sake, *immersive VR*. (I also refer to the immersed participant as an *immersant*, a phrase I introduced to the field in 1995, and to the essence of the immersive experience as *immersence*, a neologism combining the words *immersion* and *presence*.) While "virtual reality" was originally intended to signify a computer-generated three-dimensional world achieved through use of a stereoscopic head-mounted display or HMD, it is currently defined by the *Shorter Oxford English Dictionary* as "the generation by computer software of an image or environment that appears real to the senses". This widened interpretation reflects the term's (mis)appropriation in the popular media to signify everything from cyberspace to digital effects in Hollywood movies. Similarly, the word *immersive* has now been appropriated to mean almost any image that is wider or higher than a standard rectangular frame: I now find myself having to further qualify the medium with which I work as *full-body* immersive virtual space.

In the industry itself, the word *immersive* is currently associated not only with HMDs but with wide, wrap-



around or circular screens (generally known as Spatially Immersive Displays), as well as the multi-walled back-projected cube-shaped rooms known as CAVES. While such display technologies have many application-specific advantages, such as enabling unencumbered and multi-person involvement, the fact that participants can look away from the screen to see their own actual bodies and the floor they are standing on, in addition to seeing other people moving around in the physical space—thus retaining a certain *intellectual distance* from the images displayed—precludes or at least vastly dilutes the wholly immersive experiential effect that particularly interests me.

I believe sensations of full-body spatial envelopment are still most effectively enabled through a stereoscopic HMD with a wide field of view, e.g., 110 degrees, not the more commonly available 30 or 40 degrees. While the wearing of a head-mounted display is admittedly less convenient than a so-called unencumbered approach, as a scuba diver who dons a mask, skin, wetsuit, fins, regulator, octopus, wrist computer, buoyancy control vest and air tank, *plus* a dozen pounds of weights, to access the bodily-enveloping realms of oceanic space, I consider the wearing of an HMD to be a minor inconvenience. While more effective display methods may eventually emerge, unfortunately this depends on market forces: at present, head-mounted displays developed for commercial games favour higher image resolution in the quest for greater mimetic representation. Such emphasis on image sharpness or acuity takes precedence, at least in the lower price range, over having a wide field of view, which in the case of my own work is much more essential. (In fact, our experience shows that rather than enhancing the immersive effect, high-resolution in the graphics actually *decreases* the subjective experience of immersense by overriding the body's other non-visual modes of experiencing spatiality.)

The word *immerse* is described in the *Shorter Oxford English Dictionary* as meaning: 1) to dip, plunge, or submerge in a liquid; 2) to involve deeply, absorb in a particular activity or condition. I use the word primarily in terms of its first meaning, which implies a *bodily* submersion in an enveloping medium like water, even though the second meaning, of cognitive absorption, is also relevant. I deliberately emphasize the quality of being bodily-enveloped or encompassed: (*envelop*: to enclose, contain, surround, and touch on all sides; *encompass*: to surround, encircle). For my purposes, this sensuous *all-encompassing* spatial quality is key. My unrelenting emphasis on the spatially all-encompassing quality of a truly immersive experience is not without reason: reference to *surrounding* suggests that there is something, *someone*, being *surrounded*, that there is a perceiving *subject* at its centre. The implication of this emphasis on my part is a deliberately shifted focus from the notion of space as an empty void or an endless isotropic expanse (as in Euclidian space) and as the geometrical domain of xyz coordinates (as in the technology of 3D computer graphics) to space as it is subjectively experienced—i.e., as it is inhabited—thus transforming the abstraction of space into *place*. And being *in place* suggests having a *body*.<sup>[5]</sup>

As the geo-philosopher Edward Casey writes in *Body, Self, and Landscape: A Geo-philosophical Inquiry into the Place-World* (2001:413), the experiential mode of being in place is the *embodied corporeal self*.

According to Casey: "In the presence of place, there can be no subject other than a corporeal subject capable of possessing habitus, undertaking habitation, and bearing the idiolocality of place itself." And, he emphasizes, this is a "concrete self of the hearth, not a disembodied occupant of the cosmos". Similarly, Merleau-Ponty, in *Eye and Mind* (1964:178), writes that space conceived from an embodied perspective is no longer what it was in Descartes' *Dioptric*, (i.e., a "network of relations between objects such as would be seen by a witness to one's vision or by a geometer looking over it and re-constructing it from the outside"), but rather such space starts from the perceiver "as the zero point the zero degree of its spatiality". He writes: "I do not see space according to its exterior envelope; I live it from the inside; I am immersed in it." Emphasizing the experience of being spatially enveloped, he concludes: "after all, the world is all around me, not in front

of me." Seen in these terms, to be fully immersed in the world is to *relinquish distance, relinquish the frontal gaze*, giving up one's stance as a disinterested so-called objective observer surveying a world separate from one's self, and instead, to inhabit it, as a corporeal subject, as a lived body, from the *inside*. I believe that the medium of immersive virtual space is particularly suited to exploring this terrain.

As I have written elsewhere, I think of immersive virtual space as a spatio-temporal visual-aural arena, wherein mental models or abstract constructs of the world can be manifested virtually in three dimensions (actually four, including time), and then be kinesthetically explored by others through full body immersion and real-time interaction. No other means of artistic expression allows this. Particularly important to me as a former painter is how in a fully immersive virtual environment, the viewer can, in effect, cross over the picture plane, beyond the two-dimensional painterly or photographic surface, and bodily enter the spatio-temporal construct of the artist's world, becoming immersed within its flows.

In terms of experiential effect, immersive virtual space is thus richly paradoxical: it can be experienced not only as an artificially constructed *symbolic* space, but simultaneously (paradoxically) as an *actual* space, which *feels* real, in the sense of being three-dimensionally extended and all-surrounding, with navigable stereoscopic spatial depth. In such an environment, the participant is able to seemingly enter, move about and explore at will, encompassed by spatial potentialities, as if they "really" were in an actual place.<sup>[6]</sup> Such paradox, such *slippage* of boundaries between the virtual and the actual, between pre-constructed concept and experientially-flowing percept—whereby (at least in the case of my own work) the medium's immateriality can be experienced as coexisting with an apparently real three-dimensionality of form, whereby it is possible to seemingly float gravity-free among semi-transparent entities and pass *through* them as well, all the while being grounded in the physical body's rhythmic breath—tends to create perceptual confusion in the mind of the participant. The potential for such confusion, such *dissolution* of habitually conceived categories and boundaries, is the source of the medium's most singular power. It is this potential which most interests me.

As I have so far defined it, the immersive virtual environment could thus be said to harbor a unique convergence, or even an osmotic *intermingling* of spatialities—interior and exterior, mental, physical and social—which can be artistically-constructed, bodily inhabited and performed. In this context, I would say that virtual space is a new kind of conceptual and experiential working space, one that not only paradoxically integrates the virtual and the real, but which potentially (when constructed in a certain way) facilitates a dissolution of conventional boundaries between perceiver and perceived.

In saying this, I want to emphasize that I do not envision the medium in Utopian terms, nor do I believe my desire to facilitate immersion in an image space on the other side of the picture plane is without precedent. As Oliver Grau has written in *Virtual Art: From Illusion to Immersion* (2003), there is a long tradition of constructing spaces of illusion, from the frescoes of Pompeii, baroque ceiling paintings, painted panoramas between 1787 to 1895, Monet's panoramic water lilies, to the evolution of various filmic devices including the Stereopticon, Cineorama, Omnimax theatres, etc. Immersive virtual environments can indeed be considered the most recent manifestation of this illusionistic desire, a desire to be wholly-encompassed by the artwork, to be totally merged within its representation.<sup>[7]</sup>

As an historian considering the medium's sociological implications, Grau questions (202-203) whether the urge to construct such experiential "totality" through immersion in virtual environments may ultimately have a politically coercive effect whereby all "critical distance" is lost, as boundaries between perceiver and perceived are broken down. I believe, however, that such distance, with its implied supposition of objectivity on the part of the observer, reflects the very dichotomy, the duality, that is so characteristic of the Cartesian worldview.

While I cannot speak from a perspective of 100 years hence looking back at the eventual sociological consequences of the form, as an artist engaged in producing such work, I cannot emphasize enough that my work is expressly based on the desire to *collapse* such distance and to *dismantle* such boundaries (or at least make them osmotically porous). In my art practice, I have sought to articulate a sensibility of the world not as I habitually see it through the filter of dualism, but rather as I imagine it might be or could be *beyond* such a world view. By employing the medium of immersive virtual space—through its paradoxical qualities of immersence, immateriality and interactivity—as a facilitating or enabling spatio-temporal context for perceptual experience of boundary dissolution, my ongoing artistic/philosophical project is nothing short of attempting to dismantle the western worldview by de-habituating and re-invigorating our perceptions of being in the world.

## 4. Immersive Virtual Space as a Means of Invigorating Perception

The task I'm trying to achieve is above all to make you *see*.

(D.W. Griffith, in Kracauer, *Theory of Film*)

In the *Poetics of Space*, the philosopher Gaston Bachelard (1969:206) wrote: "By changing space, by leaving the space of one's usual sensibilities, one enters into communication with a space that is psychically innovating. ... For we do not change place, we change our nature." Bachelard was describing the transformative potential of space. Specifically, he was referring to immense open places like the desert, the plains and the deep sea, which, because they are unfamiliar, because they are *unlike* the environments to which most of us are accustomed in our everyday lives, can be psychically invigorating.

My approach to the medium of immersive virtual space is based on the conviction that it can potentially facilitate the same kind of perceptual effect, functioning as an experiential site for invigorating our perceptions of the world around us. For whereas our familiarity with everyday environments lulls us into a kind of perceptual autopilot, the unfamiliarity of immersion in a virtual environment (i.e., one which has been deliberately designed to be unfamiliar) can facilitate a refreshing, even a questioning, of habitual perceptions and assumptions. I cannot emphasize enough, however, that such potential exists *only* to the extent that a virtual environment is designed to be *unlike* the space of our usual perceptions, that it is not used to mimetically reproduce literal appearances or habitual behaviours from the "real" world. When designed in ways that merely reflect our usual assumptions, such environments (regardless of innovative content) forego their transformative potential and by default, serve to reinforce the status quo.

In *Through the Vanishing Point: Space in Painting and Poetry*, Marshall McLuhan (1969:252) wrote that "one of the peculiarities of art is to serve as an anti-environment, a probe that makes the environment visible". Stating that the role of the artist is to "open the door of perception to people otherwise numbed in a non-perceivable situation", he emphasized that this function of art is betrayed if the artist "merely repeats the bias of the culture instead of readjusting it" (241). Accordingly, it is only when virtual environments are constructed in ways that circumvent or subvert the technology's conventions (i.e., its bias towards mimetic representation, disembodiment, and will to dominate and control) that the medium of immersive virtual space can be used to convey alternative sensibilities and world-views. To use the medium otherwise (with the exception of didactic applications such as medicine and practical training) is to miss its unique potential as a perceptually and conceptually invigorating philosophical tool.

In my work, I have thus sought to rethink the technology, not as a means of escape but of *return*, as in a

*returning of attention*, to our own being. In this context, I am most interested in the medium's potential for facilitating a questioning in the sense meant by Bachelard, so that we might reconsider ourselves, here now, in the living dying world *freshly*, beyond the Cartesian divide. I thus approach the medium as a site for representing what I envision might lie behind the static solid surface appearances of the world, and for destabilizing the boundaries between interior, exterior, mind and body, self and nature, so rigorously defended by the dualist worldview. I am most interested in the medium's capacity as a philosophical and experiential *techné* for reconsidering our own embeddedness and osmotic intermingling in the intricately entangled fluxings and flowings of the Earth, for re-sensitizing us to our own being and becoming ... here now ... embodied as we are so briefly ... *among all this*...

## Notes

[1] *Osmose* (1995) and *Ephémère* (1998) were constructed with the dedicated participation of the following individuals: John Harrison, custom programming; Georges Mauro, graphics; Dorota Blaszcak, 3D sonic architecture; and Rick Bidlack, sound composition. Created with Softimage software and custom programming, these works were originally designed to run on a Silicon Graphics supercomputer: in 2002 however, they were ported onto a PC.

While immersion in *Osmose* and *Ephémère* is designed to be intimate and solitary, during public exhibitions the experience takes on a performative aspect. In this context, the private immersion chamber is located adjacent to a large dark space where visitors can assemble. Here, the immersant's journey is projected on a wall in real-time, i.e., as it is being experienced live by the immersant. This space is also filled with the sounds being generated by the immersant's behaviour. In addition, the shadow silhouette of the immersant's body is cast on another wall as s/he moves and gestures within the work. The use of this shadow-silhouette alongside the real-time projection is intended to draw attention to the body's role as ground and medium for the experience.



[2] See, for example, C. Merchant (1980) *The Death of Nature: Women, Ecology and the Scientific Revolution*, San Francisco: Harper and Row; E. F. Keller (1985) *Reflections on Gender and Science*, New Haven: Yale University Press; N. Evernden (1985) *The Natural Alien: Humankind and the Environment*, Toronto: University of Toronto Press; M. Berman (1990) *Coming to Our Senses: Body and Spirit: Body and Spirit in the Hidden History of the West*, New York: Bantam; V. Plumwood (1993) *Feminism and the Mastery of Nature*, New York: Routledge; D. Harvey (1996) *Justice, Nature and the Geography of Difference*, Cambridge MA; and D. Abram (1996) *The Spell of the Sensuous: Perception and Language in a More than Human World*, New York: Pantheon Books.



[3] Over the past decade, numerous individuals have criticized the cultural biases in digital technology. Not surprisingly, the majority of these writers are women. Some of the *earliest* essays include: V. Sobchack (1991) "New Age Mutant Ninja Turtles, *Art Forum*"; D. Haraway (1991) "A Manifesto for Cyborgs: Science, Technology, and Socialist Feminism and the Late 20th Century" in *Simians, Cyborgs and Women: The Reinvention of Nature*, New York: Routledge; Z. Sophia (1992) "Virtual Corporeality: A Feminist View"; N. Tenhaaf (1992) "Of Monitors and Men and Other Unsolved Feminist Mysteries: Video Technology and the



Feminine" in S. Penny, ed. *Critical Issues in Electronic Media*, Albany: State of NYU Press; C. Gigliotti (1993) *Aesthetics of a Virtual World: Ethical Issues in Interactive Technological Design*, PhD dissertation, Ohio State University; N. K. Hayles (1993) "The Seductions of Cyberspace", in V. Conley, ed. *Rethinking Technologies*, Minneapolis: U. of Minnesota Press; H. Tikka (1994) "Vision & Dominance: A Critical Look at Interactive Systems" in *ISEA'94 Conference Proceedings* Helsinki; and S. Penny (1994) "Virtual Reality in the Completion of the Enlightenment" in T. Druckery and G. Bender, ed. *Culture on the Brink: Ideologies of Technology*, Seattle: Bay Press.



[4] The notion of *enframing* is discussed by Heidegger in *The Question Concerning Technology* (1977, New York: Harper and Row) in which he describes modern technology as an instrument of domination which reduces the world to a standing reserve for human exploitation. In another essay however ("The Turning") Heidegger suggests that the danger associated with technology, i.e., its will to control, can be turned around by reaching back to an earlier *techné*, called *poiesis* by the Greeks, associated with a bringing-forth into presence. The notion of such a possibility has contributed to my attempt to develop an alternative VR, approaching the medium as a means of evoking subjective experiences which might transcend our culturally-tinted lenses of perception. I direct interested readers to Laurie McRobert's exploration of such Heideggerian concepts in relation to my work in her book [Char Davies' Immersive Virtual Art and the Essence of Spatiality](#).



[5] The meanings of *space* and *place* have been the topic of many studies. See, for example, E.S. Casey (1997) *The Fate of Place: a Philosophical History*, Berkeley: University of California Press; D. Gregory (1996) *Geographical Imaginations*, Cambridge MA: Blackwell; E. W. Soja (1989) *Postmodern Geographies: The Reassertion of Space in Critical Social Theory*, London: Verso; Yi-Fu Tuan (1977) *Space and Place: the Perspective of Experience*, Minneapolis: U of Minnesota Press; and M. Wertheim (1999) *The Pearly Gates of Cyberspace: A History of Space from Dante to the Internet*, London: Virago Press.

The issue of embodiment in relation to spatiality has been examined by numerous writers working from a phenomenological perspective, including of course Maurice Merleau-Ponty. Others include (to name only a few): V. Kirby (1997) *Telling Flesh: The Substance of the Corporeal*, New York: Routledge; D. F. Krell (1997) *ArcheTICture: Ecstasies of Space, Time and the Human Body*, Albany: State University of New York Press; D. Leder (1990) *The Absent Body*, Chicago: University of Chicago Press; and H. J. Nast and A. Kobayashi (1996) "Re-corporealizing Vision" in N. Duncan, ed. *Bodyspace*, New York: Routledge.



[6] Many of the approximately 20,000 [approximately 35,000, as of November 2007]† individuals who have experienced immersion in *Osmose* and *Ephémère* have exclaimed afterwards that they felt that they had been in a real place, even while rationally knowing they were not, leaving them with an inexplicable and unrequited longing to return there, even if they did not know where "there" was. I have examined these responses, drawing parallels with psychological analyses of altered states of consciousness, in an essay titled "[Changing Space: VR as an Arena of Being](#)", published in *The Virtual Dimension: Architecture, Representation and Crash Culture*. J Beckman, ed. Boston: Princeton Architectural Press (1998), and also in *Multimedia: From Wagner to Virtual Reality*. R. Packer and K. Jordan. NYC: Norton (2003).



[7] Other historical analyses of technologies antecedent to VR include: J. Crary (1993) *Techniques of the Observer: On Vision and Modernity in the 19th Century*, Cambridge, MA: MIT Press; and E. Huhtamo (1995) "From Kaleidoscomaniac to Cybernerd: Notes toward an Archeology of Media", in Druckery, T., ed. 1995. *Electronic Culture: Technology and Visual Representation*, New York: Aperture. For a history of the panorama see: S. Oettermann (1997) *The Panorama: History of a Mass Medium*, NY: Zone Books; and B. Comment (1999) *The Painted Panorama*, New York: Abrams. Other relevant historical studies include: H. Damisch (1995) *The Origin of Perspective*, Cambridge MA: MIT Press; M. Kemp (1990) *The Science of Art: Optical Themes in Western Art from Brunelleschi to Seurat*, New Haven: Yale University Press; E. Panofsky (1991) *Perspective as Symbolic Form*, New York: Zone books; and J. White (1957) *The Birth and Rebirth of Pictorial Space*, 3<sup>rd</sup> ed. 1987 Cambridge MA: Harvard University Press.



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See [www.immersence.com](http://www.immersence.com) for a comprehensive bibliography on Char Davies' work, including published texts by the artist and others.

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