

# OSMOSE

## NOTES ON BEING IN IMMERSIVE VIRTUAL SPACE

*By Char Davies*

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*...through their "immensity" these two kinds of space  
- the space of intimacy and world space-blend.  
When human solitude deepens, then the two immensities  
touch and become identical.*

*...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.*

Gaston Bachelard, *The Poetics of Space*, 1964

**T**hese notes have been developed during the process of conceptualizing and realizing the immersive virtual space, OSMOSE. As theory and practice, OSMOSE addresses a number of aspects related to the medium of "virtual reality" that are often overlooked: these involve the very essence of the medium, in terms of immersive spatiality and the role of the body within its domain. In OSMOSE, I have set out to create a work which expresses an emotional and visionary content particular to my own practice as an artist, and in so doing demonstrate the medium's potential to enable us to experience our place in the world afresh, or to paraphrase Bachelard, *to change space in order to change our nature*. Now that OSMOSE is out in the world, I have been able to incorporate into these notes certain insights gained from public response to the work.

### **OSMOSE / as technology and installation**

OSMOSE is an interactive immersive virtual environment, utilizing 3D computer graphics and spatialized sound. The core experience is that of the "immersant", accessed via a stereoscopic head mounted display and a motion capture vest with breathing and balance sensors. A secondary aspect of OSMOSE is the audience's vicarious witnessing of each immersant's journey in real-time, via stereoscopic video projection and headphones. The installation at the Musée d'art contemporain (Aug. 19 - Oct. 1, 1995) consists of a dark quiet space and two large-scale openings of light facing each other, one horizontal, the other vertical, one the stereoscopic video projection, the other a shadow-silhouette of the immersant. This silhouette serves to poeticize the immersant's body gestures (along with head mount, cables etc), allowing privacy while drawing the audience's attention to the role of the immersant's body as a medium for communicating experience. OSMOSE was created with

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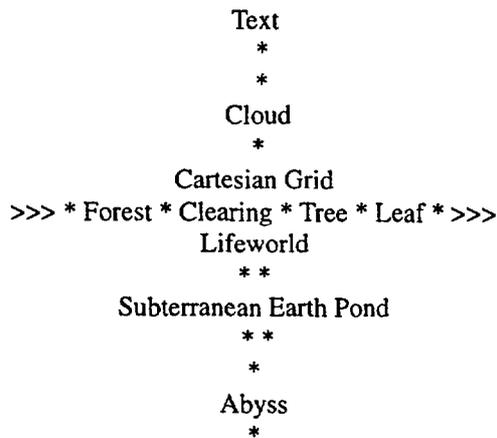
Softimage 3D and custom VR software and runs on a Silicon Graphics parallel processing Onyx computer. Information on the creative process and team members is included further along in this text.

### OSMOSE / as content

Simply stated, OSMOSE is about “being-in-the-world” in its most profound sense, i.e. our subjective experience as sentient, embodied, incarnate, living beings embedded in a spatially-enveloping living flowing world. Osmosis: a biological process involving passage from one side of a membrane to another. *Osmosis as metaphor: transcendence of difference through mutual absorption, dissolution of boundaries between inner and outer, intermingling of self and world, longing for the Other.* OSMOSE as an artwork is motivated by the desire to heal the Cartesian split between mind and body, subject and object, which has shaped our cultural values and contributed to our dominating and alienated stance towards life. In this context, OSMOSE seeks to re-sensitize, reconnecting mind, body and world.

There are a dozen virtual world-spaces within OSMOSE. Most of these, with the exception of an introductory Cartesian Grid, are based on archetypal elements of Nature: they include a Forest, Leaf, Clearing, Pond, Abyss, Subterranean Earth, and Cloud. Two other worlds, Code (containing 40,000 lines of custom software used to create the work) and Text (my own writings and excerpts of relevant philosophical and poetic texts on nature and technology) function as a substratum and superstratum parenthesizing the work. All of these worlds connect to one another in various ways. There is also a Lifeworld, symbolizing life/Earth itself, which appears when it is time to bring the immersive session gently to a close.

#### *A simplified schematic of OSMOSE:*



### OSMOSE / as a visual and aural aesthetic

The visual aesthetic of OSMOSE is soft, semi-transparent and ambiguous, consisting of luminous particles and translucent textures. I have developed this aesthetic over years of my own art practice, first through painting and then through making still images with Softimage 3D software. Most of the various world-spaces of OSMOSE are represented poetically, in terms of their implicit, interior qualities rather than phenomenal outward appearances. Representation fluctuates between figuration and abstraction, and figure/ground relationships are ambiguous to allow for open-ended emotionally-associative interpretations, rather than superficial illustration. Temporal transitions between world-spaces are long-lasting and subtle, creating fluid, spatially-complex, non-Cartesian relationships between worlds. All of these elements work together to loosen the mind’s rational hold, dissolving the subject/object dichotomy, and in a dream-like way shifting the immersant’s mode of experience from the everyday bias of eyesight to one that resonates deeper within the body.

The sound in OSMOSE is spatialized and interactive in real-time, responding to changes in the immersant’s location, direction and speed. In a lay person’s terms (not being a musician) my goal was to have sound that was neither literal nor illustrational, musical nor sound effect-like, but which was, in equivalence to the visual aesthetic, aurally ambiguous. I also wanted the sound to be hauntingly emotional rather than abstract or chaotic, which provided a challenge to the composer and designer working with me who were faced with the challenge of spatially and temporally shaping a composition that would change in real-time according to the immersant’s interaction. All the sounds in OSMOSE are derived from samplings of a single male and female voice, a compositional decision which subliminally re-affirms the presence of the human body within the work. The significance of sound in the design and experience of virtual spaces is often underestimated: in OSMOSE, sound and imagery have become one, amplifying each other.

### OSMOSE / as an interactive aesthetic

The interactive aesthetic or user interface of OSMOSE is body-centered. It is based on the intuitive, instinctual, visceral processes of breathing and balance. Through breath, the immersant is able to rise and fall in space with subtlety and precision. By altering the centre of balance, the immersant is able to change direction. The use of these methods, inspired by my own experiences of scuba diving, has many implications for the work as a whole, both on an instrumental level and in terms of metaphor. They are intended to re-affirm the role of the living physical body in immersive virtual space, as subjective experiential ground. They are also intended to act as channels of communion rather than tools of control. As in meditation, the practice of following one’s breath and being centered in balance opens up a profound way of relating to the world (Drew Leder, *The Absent Body*):

Breath is a potent tool of overcoming dualism. Physiologically, respiration stands at the very threshold of

the ecstatic and visceral, the voluntary and the involuntary... inside and outside, self and Other are relativized, porous, each time one takes a breath. The air is constantly transgressing boundaries, sustaining life through inter-connection. One may have spent years studying the mystics on the unreality of dualism and this remain an abstract idea. But in following breath, one begins to embody this truth. p178

Balance is a question of centering. When we are properly centered, our experience of Being is in equilibrium. Being well-centered, we can encounter other beings in a more open, receptive way. Finding our center is a necessary step in the development of our ontological capacity to open ourselves to the larger measure of being and to encounter other beings with a presence that is deeply responsive. Coming home to our true center of being, we can begin to relax our egological defences, and begin to experience things outside the subject/object polarization. Being well-centered in Being is therefore at the very root of *Gelassenheit*, that "way of being" in virtue of which according to Heidegger, we are going to be most favoured with a deeper experience of beings, and the presencing of Being as such. p274

#### **OSMOSE / as a medium of expression**

The desire to express a particular content preceded all else in OSMOSE. The themes in OSMOSE, related to archetypal aspects of nature and the body and enveloping luminous space, have been the focus of my artistic practice - through painting and 3D software - for more than fifteen years. My background as painter, i.e. thinking in terms of simultaneous relationships rather than linear narrative, of ambiguous semi-transparent figure/ground gestalts rather than literal illustration has profoundly influenced OSMOSE's visual aesthetic. In the mid-80's I abandoned painting when the two-dimensional picture plane became a limitation for expressing my ideas, and became involved with 3D computer graphics because of its potential for creation in virtual three-dimensional space. Between 1990 and 1993, I produced a series of still images with Softimage 3D software, titled *The Interior Body* series, comprised of images called *Leaf*, *Root*, *Seed*, *Bloom*, *Stream*, etc, all metaphorical themes which reoccur in OSMOSE. Although these images were created in 3D space they were output as flat 2D stills. It was therefore a natural progression for me to move into VR or what I prefer to call "immersive virtual space" (since the term VR is so overused it doesn't mean anything anymore) because of its spatially-enveloping quality. The museum installation includes a painting from 1985 which was an attempt to represent luminous enveloping space. In OSMOSE, a decade later, I have found the medium capable of expressing my artistic vision.

#### **OSMOSE / as space**

The medium of OSMOSE is immersive virtual space. This is not merely a conceptual space but space in the sense of being extended, three-dimensional, and enveloping. At present, full access to this space is possible only via a stereoscopic head-mounted display. Although such encumbrance is disparaged by many, as a diver who dons a tank of air, mask, fins, weights and buoyancy-control vest to access oceanic space, the wearing of a Head Mount is to me a minor inconvenience because it offers access to another kind of space. Immersive virtual space is a new space to which we now have bodily access. I think of it as a spatial-temporal arena, where mental models or constructs of the world can be given virtual form and then kinaesthetically, synaesthetically explored through full-body immersion and interaction. No other space allows this, no other medium of human expression. As humans, we have access to very few kinds of physical space. I can think of only terrestrial space and oceanic space. (Outer space isn't accessible to most of us, and cyberspace isn't relevant to this discussion because it is not bodily-accessible unless it takes on the qualities of immersive virtual space.)

At present, most people rely on their everyday experience of terrestrial space when it comes to designing virtual environments. As a result, virtual worlds are filled with hard-edged-solid-objects-in-empty-space, horizontal floors and walls, etc. Similarly, interface/navigational methods are based on walking, bicycling, driving with joysticks etc. Not only does this approach to the medium severely limit its potential, but it tends to uphold the status quo, conveying dominant Western cultural values.

OSMOSE has been influenced by my experience as a diver of deep oceanic space. Oceanic space, in comparison to terrestrial, is not empty but enveloping and sensuous, not horizontal but vertical, often beyond measuring. At depths of 100-200 ft of water over a 6000 ft abyss, the ocean takes on the quality of pure limitless space, fluid, enveloping, interior, embryonic. Distinctions between near/far and inside/out become blurred: a luminous speck can be a distant pelagic or rod misfiring in the retina of one's own eye. Divers do not walk or drive or manipulate joysticks, but float, free from gravity, using subtleties of breath and balance to ascend and descend. Buoyancy control is an essential skill that enables divers to move subtly and sensitively. When this skill is mastered and the diver is able to hover motionlessly, suspended, it is an extraordinarily mind-altering experience. Two years ago I was diving above a blue hole in the Bahamas, floating between layers of lacy white cobweb-like algae and warm ochre gas-clouds: I lost all sense of where I was, whether I was inside a dream, or was having a drug-induced hallucination, or whether I had become a bird flying through heaven. Diving offers a means of changing space.

There is another physical space, not exterior but interior, which bears resemblance and relevance to immersive virtual space. This is the subjectively-felt space of the self, i.e. the interior space into which our minds and visceral organs project the

immaterial imagery of dreams. All human imagery arises from a single psycho-physiological source, namely the human imagination grounded in the material body (see Campbell). Although our culture has drastically separated exterior from interior, and valued the objective over the subjective, poets such as Rainer Maria Rilke and the philosopher Gaston Bachelard spent their lives re-affirming the inter-relationship, the interplay between exterior physical world-space and the interior spiritual space of self. The Buddhist and Neo-Confucian traditions of "forming one body with all things" otherwise known as expansive awareness also explore this relationship. (see Leder, and Callicott) My own desire to heal the schism between outer and inner is probably based on an experience I had twenty years ago, in a field at dusk, when for an instant the boundaries of my mind expanded to merge with the horizon, creating of sense of union between self and world that I have been seeking ever since. Both of these spaces, inner and outer, merge osmotically through the body.

### **OSMOSE / as body**

It is impossible to speak of immersive virtual space or of enveloping physical space without speaking of the body, for the very experience of being spatially-enveloped depends on having a centre-of-being. And for us, as incarnate beings, this centre is the body. It is only through the living organic body that we can access the world. It is only through the body that we can transcend the body. My concerns with the body in immersive virtual space are not with its objective representation, i.e. how it is perceived by others, but rather how the immersant's body is subjectively-felt, how the immersant senses his or her own interior body as a centre-of-being within immersive space. By its very nature, immersive virtual space invites full-body kinaesthetic exploration, leading to deeper engagement than that involving just the mind. Immersion in OSMOSE is deliberately solitary for the goal is not to connect the immersant to other people but to the depths of his or her own self.

The paradox of experiencing immersive virtual space is that it feels both embodied and disembodied at the same time. In OSMOSE, for a variety of reasons, this paradox is amplified. After a certain period of immersion (usually about ten minutes), various conditions related to imagery, luminosity, semi-transparency, spatial ambiguity, slow subtle transitions between worlds, evocative resonant sounds, along with solitude, deep breathing and maintaining a centre of balance within the space all combine to create a suspended dreamlike state in the immersant's mind, which is experienced as a distinct shift of awareness as he or she lets go and boundaries between inner, outer, mind, body, space and time are dissolved.

I believe that it is only through the body, through body-centered interfaces, that we can truly access this space and explore its potential. I am also aware that recognition of the body's role in immersive virtual space may be inherently female. The whole notion of space as enveloping and womblike around a body at its centre is probably feminine rather than masculine, as is the desire to use this technology to re-sensitize rather than de-sensitize, to re-affirm life itself.

### **OSMOSE / as immateriality and temporality**

Another key aspect of immersive virtual space is its immateriality. By this, I mean its capacity to contain immaterial forms, i.e. within this space it is possible to create three-dimensionally embodied forms which cannot exist physically in the real world. This obviously differs from two-dimensional media such as painting and photography, but also significantly from sculpture in that these forms, even when extending through virtual three-dimensional space, have no solidity, no materiality and it is possible to float right through them. In OSMOSE, this immaterial quality is pushed even further through its visual aesthetic which relies on semi-transparency to create spatial ambiguity. In addition, emphasis has been placed on representing aspects of Nature which we cannot normally see instead of mimetically reproducing surface appearances of solid objects already existing in the real world.

OSMOSE also encompasses a temporal dimension. By this I do not mean the obvious aspects of real-time interaction or movement within the space by the immersant or other entities but transformation. OSMOSE is concerned with the transformative aspect of life or Nature, i.e. life as an irrepressible current, flowing through various phases of life and death, and the transformation of light to darkness through cycles of dawn, day dusk and night. This notion of fluidity is essential not only to our subjective experience of being, but to life itself.

In OSMOSE, the effect of these qualities on the immersant is strangely euphoric, and increases the paradoxical sense of embodiment/disembodiment. For me, the categories of immaterial and material, mind and matter, body and spirit are all osmotically interlinked: immersive virtual space seems to be the most effective medium for exploring their connections.

### **OSMOSE / as nature**

It is important to address here the relationship in OSMOSE between Nature and technology. In this context, by Nature I mean that which is not-man-made, i.e. the living flowing world around us, not the cement and pavement and plastic and steel that surround us in cities but earth and rivers and forests and fields. These have a deeply life-affirming power, because they are not-us and are the source from which we came and to which (cyborgs excepted) we will return. As technology, OSMOSE does not seek to replace Nature. Immersion in OSMOSE is not a replacement for walking in the woods. What OSMOSE can do however, like all art, is filter human experience of Nature through an artist's vision, distilling or amplifying certain aspects, so that people who experience OSMOSE can see freshly, can become re-sensitized so the next time they walk in the woods, they may experience it more fully, more openly. In reminding people of the extraordinariness of simply being alive, OSMOSE may inspire people to protect those woods as well. OSMOSE is not a replacement for Nature, but a spatial-temporal arena we can perhaps re-learn how to be.

### **OSMOSE / as creative process**

The making of OSMOSE has been a team effort. It could not have been created by one person working alone. Although its themes and aesthetic have evolved over more than a decade of solitary painting and making images with Softimage software, I actually began writing about OSMOSE two years ago, working out the concept, the various worlds, the interactive approach etc, before getting a team involved. Georges Mauro who is responsible for the graphics in OSMOSE, is a classically trained animator who has worked with me and on Softimage for many years and who has come to understand my aesthetic and painterly approach to creation. John Harrison, who wrote all the custom virtual-reality software for OSMOSE, joined the Visual Research team a year and a half ago and brought considerable expertise as well as a sincere desire to work towards an artist's vision. Ground work and testing of various techniques took place over a year, while actual world-building and immersion in the HMD began only six months ago. In May, Dorota Blaszcak came from Poland to design and program the sound. She was joined soon after by Rick Bidlack from Seattle who composed and programmed all the music. They worked closely together, with little time, lots of pressure and off-the-shelf equipment, to translate my vision into sound.

Once we were able to become immersed in the worlds, my attempts at pre-scripting interactive possibilities were superseded by responding in situ to the work as it progressed. In this way, the creative process itself became very much like painting, a combination of planning and serendipity, where a single change affects everything else, and all world-spaces had to be constantly reworked in relation to each other, so that the entire work evolved as a whole. I consider OSMOSE as a work-in-progress and we have many uncharted areas to explore.

### **OSMOSE / in context**

The context in which OSMOSE is situated is of prime importance. Our culture's privileging of mind over matter has contributed to devaluation of the body, as well as women and various "others". Historically, this world-view has contributed to the plundering of non-human beings and their habitats as objects for human use: the negative implications of this stance are becoming ever more apparent as evidence of world-wide environmental degradation increases. As "unspoiled" unmediated Nature recedes from our lives through urbanization of human populations and habitat destruction, there are signs that while the biological consequences for many species (including ourselves) are devastating the effects may be psychologically damaging as well. This premise known as the Biophilia Hypothesis (developed by the Harvard biologist Edward O Wilson) suggests that the increasing loss of access to Nature - as a source of human spirituality - may prove to be at the root of our collective psyche's deepest wounds.

As a culture, we are on the cusp of a new technological paradigm: the emergence of cyberspace as a means of global communication will alter our world significantly. We must however be wary: as a realm ruled by mind, cyberspace is the epitome

of Cartesian desire, in that it enables us to create worlds where we have total control, where the presence of aging mortal flesh and animal-others is denied, and where there is, to paraphrase Laurie Anderson, no "dirt". Popular and media-hyped expectations of "virtual reality" reflect a longing to transcend the limitations of our physical surroundings. The long-term effect may be to seduce us to turn away en masse from our bodies and Nature, enchanted and distracted while we continue wasting the resources that sustain us and erasing the futures of countless other-beings on the Earth. This desire to escape the body may be symptomatic of pathological denial of our materiality and mortality. For me, it is tempting to suggest that belief in artificial intelligence and silicon as a means of delivery into immortal omni-potence on some other Eden is a but testosterone-induced dream...

Many forms of digital media offer evidence of these dominant cultural values. In its most prevalent form, virtual reality can be considered to be "a literal re-enactment of Cartesian ontology" (see Coyne, Gigliotti) representing the human subject as an omnipotent and isolated view-point, "an island of consciousness in a sea of insensate matter" (see Leder) maneuvering in empty space and probing objects with an acquisitive hand (see Tikka). Most 3D graphic techniques are laden with conventions such as Cartesian space which have been inherited from the Western scientific and military paradigm. The conventional 3D computer graphic aesthetic relies on polygonal textured-mapped models - "hard-edged solid objects in empty space" - a combination of low-level mimetic realism with emphasis on surface appearance, Cartesian space and Renaissance perspective, all of which reinforce a dualist way of seeing the world in terms of mastery and control (see Jones, Wright). Commercial computer games approach interactivity as a means of empowering the human subject, most often male (see Cornwall). These approaches to digital media reflect our culture's Cartesian world-view, with its tendency to reduce the world and its myriad of inhabitants to "standing-reserve" for human consumption (see Heidegger). In this context, conventional use and consumption of the technology is increasing our estrangement from Nature, and the de-sacralization of our world. OSMOSE approaches these issues by using immersive virtual space as a means of *resisting* the trajectory described above, as a way of acting against the increasing biological, ecological, and spiritual impoverishment of our age.

### **OSMOSE / in summary**

The desire to re-affirm our essential physical and spiritual inter-connectedness, to *heal* the estrangement between ourselves and Nature is the germinal force behind OSMOSE. If those who enter OSMOSE can experience, however fleetingly or ephemerally, a deep embodied sense of self, of being alive in-fluid-relationship with an enveloping world, returning to the real world with greater serenity and sensitivity, then OSMOSE will have achieved its most fundamental goal. Instrumentally, this goal has involved developing the visual, aural and interactive aesthetic capable of expressing these ideas, and in so doing, dem-

onstrate the potential of immersive virtual space as a medium for kinaesthetic exploration of ideas and feelings about our place as embodied sentient beings in a living flowing world. Speaking now from experience of other people's responses to the work, it seems that in certain ways OSMOSE is succeeding: immersion within it is experienced as liberating and exhilarating, and for some, even spiritual.

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#### OSMOSE / acknowledgments

Concept & direction: Char Davies  
Graphics: Georges Mauro  
Custom VR software development: John Harrison  
Musical composition and programming: Rick Bidlack  
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