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Landscapes of ephemeral embrace : a painter's exploration of immersive virtual space as a medium for transforming perception

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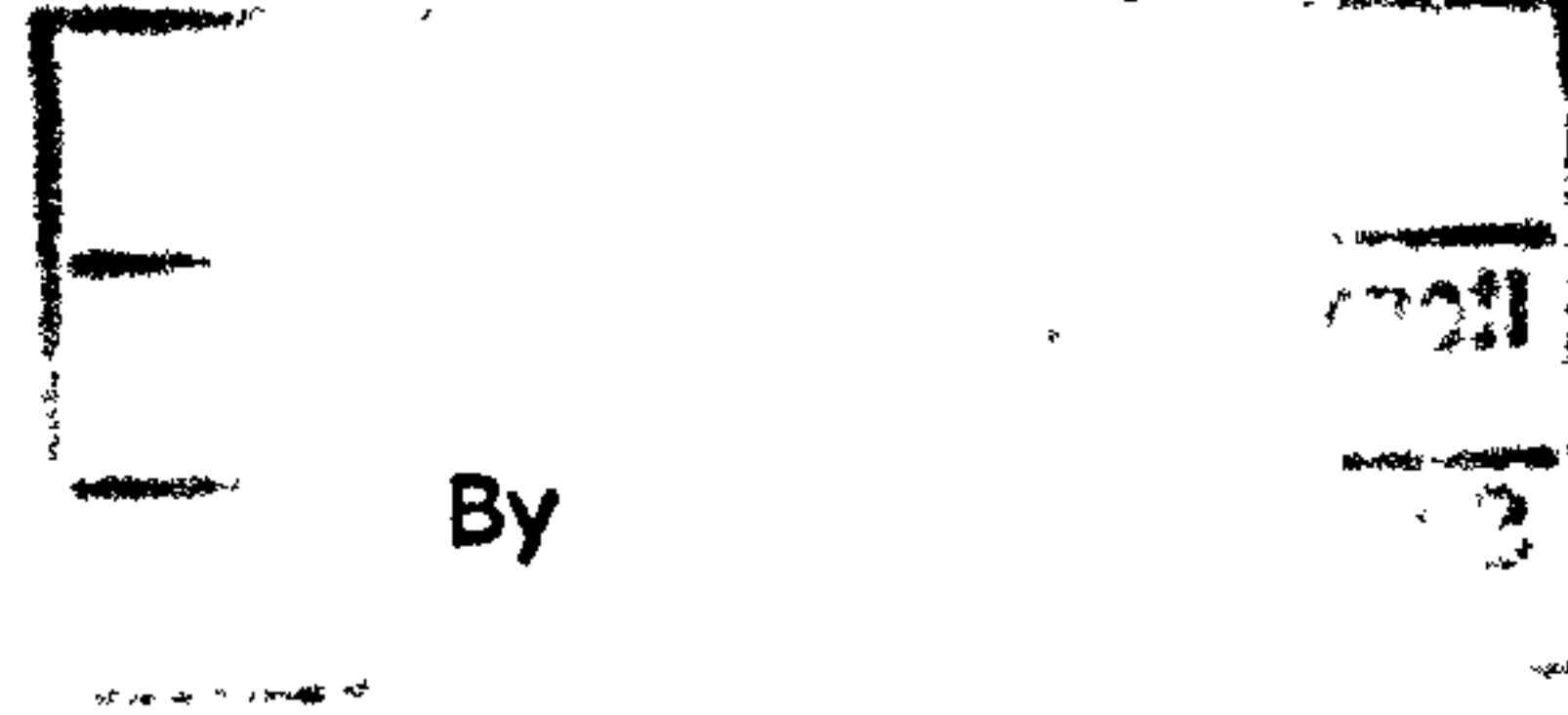
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Landscapes of Ephemeral Embrace

A Painter's Exploration of Immersive Virtual Space

As a Medium for Transforming Perception



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V

Continuing Explorations in Immersive Virtual Space:

Ephémère



Seeds, Ephémère

Digital image of 3-D virtual environment captured in real-time through HMD during live immersive journey/performance, 1998

Ephémère: the ephemerality of embodied being, of becoming; the fleeting quality of our own life spans as mortal beings among an unfathomable myriad of other beings, all engaged in comings-into-being, lingerings and passings-away, all flowings of life through space-time.

Davies, 1998

Before proceeding further, I want to remind the reader that this narrative text has been constructed to contextualize the research embodied in *Ephémère*. All previous chapters have been written with this in mind. In Chapter I, *Context: Rethinking Technology in the Reign of King Logos*, I introduced the cultural context within which my work is made, focusing on the technology associated with VR in terms of its reinforcement of certain cultural biases and conventions, and emphasizing the need to subvert these conventions in order to convey *alternative* sensibilities. Accordingly, I examined several of Heidegger's concepts such as *techne* as *poiesis* and "releasement" (*Gelassenheit*), as a possible alternative to instrumentally-objectifying technological thinking. In Chapter II, *Defining Terms: Key Concepts and Concerns in the Work*, I clarified my own definition of immersive virtual space, and discussed its particular potential as a medium for refreshing our perceptions of the world. I also introduced the thematic concerns which are central to my work, including reaffirmation of the subjective physical body in virtual space; "landscape" as artistic representation and body-

enveloping "place"; and "nature" as flux, transformation, and becoming (*physis*). I also introduced certain concepts from Zen Buddhism and phenomenology related to the experience of expansive awareness and the "undoing" of the subject/object, Interior/exterior polarization characteristic of Cartesian dualism. In Chapter III, *Origins of the Work in Prior Artistic Practice: Emergence of Key Concerns and Strategies*, I emphasized the centrality of painting (and "painterly seeing") to the development of my concerns, and traced the evolution of these concerns and my strategies for representing them over a decade of painting, as well as the transitional 3-D digital images which followed. In Chapter IV, *First Explorations in Immersive Virtual Space: Osmose*, I presented my earliest conceptualization of this medium, and described the making of *Osmose*: in doing so, I described its research context and my creative process in terms of working with a team. I also described the completed work and discussed its limitations.

My reason for recalling the chapters above is to emphasize that as an artwork *Ephémère* does not stand alone: Rather, it is the culmination of all the research which came before it, and as such cannot be separated except chronologically. This is particularly so because my work is content-driven: The constellation of concerns which has preoccupied me throughout my career has preceded, and indeed driven, my formal investigations of various media, including that of Immersive virtual space. As I explained on the opening page of Chapter I, my work in this field has been fueled by two agendas: the first being my personal artistic quest to explore and communicate my own intuitive understanding of the world, based on an attempt to go beyond the objectifying and dualistic filter of the Cartesian worldview; and the second being the necessary subversion of VR's biases and conventions in order to effectively communicate that sensibility.

I also want to emphasize that as an artist whose career now goes back more than 25 years, most of my ideas have evolved through the hands-on process of actually making work, i.e., through my art practice. Even so, I have relied on certain writers for intellectual company and encouragement: Indeed, my creative process has often felt as if it were *my* side of an ongoing conversation with a few individuals no longer living. I have returned to these authors repeatedly, especially Bachelard, Merleau-Ponty, Heidegger and others writing from a phenomenological perspective, and I have cited them in this dissertation accordingly. But that said, I want to emphasize that even while my research is theoretically informed, at its deepest heart it is fueled by personal experience.

This brings me to the current chapter, *Continuing Explorations in Immersive Virtual Space: Ephémère*. This chapter is intended to document the construction of *Ephémère*; and as such, focuses on the unfolding creative process of making the work, through chronological excerpts of the working notes I kept at the time. As I will explain in more detail, the value of these notes lies in their immediacy, and in how they show the recurrence and evolution of my central concerns in their most recent iteration. In this chapter, I also provide an overview of the completed work, narrating an Immersive trajectory through its realms. The specific strategies used in *Ephémère*, along with their philosophical implications, are discussed in Chapter VI. Before moving on, I want to remind the reader that *Ephémère*, as an Immersive virtual environment, must really be experienced firsthand, through Immersion, to be understood. With that said, this text has been constructed as a supplementary narrative to contextualize and illuminate the research that has led to this work.

1. The Making of Ephémère

The creation of *Ephémère*, involving the same team that worked with me on *Osmose*, took place over about 12 months between May 1996 and June 1998. During this period, the day-to-day process of constructing *Ephémère* in the lab was often interrupted for weeks at a time, for reasons ranging from dealing with immense public interest in *Osmose*, to the initial requirements of the CAiiA doctoral program. Most disruptive, however, was the ending of my ten-year relationship with Softimage: in spring 1997, I was notified by Microsoft (which had purchased Softimage in 1994) that support of my research was being terminated. Rather than abandoning the project, as of December 1997 I took on all responsibilities for completing *Ephémère*, leaving Softimage and setting up Immersence to do so. Needless to say, the transition was difficult for my team, which remained together only long enough to install *Ephémère* at Canada's National Gallery in June 1998. (We have, however, come together since then for shorter amounts of time related to setting up exhibitions and more recent research.)

The Ephémère Working Notes

During the research and construction process of *Ephémère*, I made detailed handwritten notes (more than 50,000 words in total), with accompanying charts and illustrations. For the purposes of this dissertation, I transcribed these notes *in their entirety* through voice-recognition software and have presented excerpts here, including only those referring to ideas which ultimately manifested in *Ephémère*, and omitting references to ideas I may explore in the future.

The original notes were written to facilitate my own creative thought process and also to serve as a memory of what was transpiring week by week. As will become evident, we experimented over and over again within a range of themes and concerns throughout the entire course of making *Ephémère*. What I mean by this is that rather than working linearly or progressively, i.e., from one scene to the next, or from the simple to the complex, we constantly revisited all aspects of the work, even up to the last evening before the work's premiere. As a result, some of the notes may have a repetitive feel, as I often returned to aspects we had previously dealt with, for I was constantly seeking to explore and refine further.

The value of these notes lies in the fact they were written in the immediacy of the "unfolding unknown" of making the work. As such, they reveal my own creative process (described in the previous chapter), but even more importantly, they show my ongoing efforts to effectively manifest – i.e., translate into this medium – the concepts and concerns discussed in Chapter II.

These notes were produced under a range of circumstances, including when I was alone imagining *Ephémère*, often during after country walks engaged in contemplative reverie (writing to stimulate the imaginative process, in terms of the associational flow of ideas in the sense meant by Bachelard, as suggested in the previous chapter). I also wrote while reading certain texts in order to clarify my ideas; and in the lab, during long meetings with the rest of the team, usually when discussing the previous week's work. As such, the notes reveal the evolution not only my conceptualization but our actual research process. In the following pages, the notes are chronologically dated and indented on the page. In certain places, I have added explanatory commentary, placing this full width and within [.....].

Notebook # 1 May - December 1996

Numina: flow, flux, transformation + perceptual relativity, reciprocity

[The work's original title was *Numina* – as in *numinous*, as a *shining-through* of some otherworldly presence. My interpretation was first informed by Mircea Eliade, in *The Sacred and the Profane*, who defines the numinous as that which presents or reveals itself as "wholly other", emanating from the sacred, or "awe-inspiring mystery" (*mysterium tremendum*).¹ My understanding was further influenced by Erich Neumann, in *Art and the Creative Unconscious*, who describes the numinous, mythical substratum of the world before it is split by the ego-consciousness into an outward physical reality and an inward psychic reality.² This concept is suggestive of "noumena" described by Francois Cheng, in *Empty and Full: the Language of Chinese Painting*, as that which is "of the nature of the origin, which is still undifferentiated and potential", in comparison to *phenomenon* as "the concrete aspects of the created universe": Cheng further suggests that the dichotomy of noumenon-phenomenon – as "neither separate or in simple opposition [but] without being on the same level ... organically linked" – suits classical Chinese thought more than a dichotomy of transcendence-immanence.³ This recalls Izutsu's comment (which I have quoted in Chapter II) from *The Interior and Exterior in Zen Buddhism*, regarding Hua-Yen metaphysics and the unimpeded interpenetration of the noumenal and the phenomenal.⁴

Nevertheless, a year into our research, on April 18, 1997, to be precise – I renamed the work *Ephémère*. This name, with its emphasis on transformation, and coming into being and passing away or perishing of all things, emerged from my writing about the work itself, and seemed increasingly relevant to the direction we were taking. In order to avoid confusion for the reader, I have substituted the word *Ephémère* throughout the following notes, even though it does not appear in the original working notes until much later.]

May 13- 17, 1996, Lab notes:

I want to widen our vocabulary – to add still rocks that can function as anchors amid the transformation. I foresee a sense of landscape transforming with myriads of transformations within it, quite dizzying, freefall. Everything (except the boulders) is flowing all the time. We have conversations about: flow, flux, light, ambiguity, life flow, temporality, relativity. All the transformations are dependent on the subjective point-of-view (position, speed etc.) of the immersant, resulting in fluid perceptual relativity. The *Osmose* Life-World appearing in the Abyss is closest to this: a gestalt, a perceptual shift.. Also key is having multiple realms at once, with multiple, semi-transparent layers that fluidly come forward or recede, depending on... These two aspects together, the relative perceptual transformations & semi-transparent veils, provide the fundamental dynamic.

[Lab meetings involved myself, John and Georges, and consisted of discussions and show-and-tell, in which I would view results of their efforts based on my requests. Most often, the process of

¹ Mircea Eliade, *The Sacred and the Profane: The Nature of Religion*, 9-10.

² Erich Neumann, *Art and the Creative Unconscious*, 7.

³ Francois Cheng, in *Empty and Full: the Language of Chinese Painting*, 150.

⁴ Izutsu, 9.

looking at such "tests" would spark further ideas between us, arising spontaneously from discussion in response to the images on the computer screen. At this early stage, George was building 3-D cg models with the Softimage software, while John was writing custom code. (A technical summary of the graphics and interactive programming written by John is in the Appendix.) Our working method remained unchanged from the method which had developed through the process of making *Osmose* two years before. At this earliest phase of the project, we were basically beginning to try out various possibilities which might serve as the visual vocabulary, a "repertoire" of scenes, elements, and effects. Everyone already knew the general goals of the work, in terms of continuing where *Osmose* had left off. From the beginning, we were attempting to deal with flow and transformation.

The entry below is the first reference to the seasonal transformation which ultimately provides the temporal structure of the final work, in terms of the Landscape (Forest) level of *Ephémère* with its winter dormancy, spring blooming, summer flux, and fiery autumnal climax. Note that I also make reference to a symbolic opening of light, a luminous doorway which can be entered.]

May 19, 1996 Notes from the country:

Looking at the horizon of hills, with mountains appearing and disappearing in fog. Similarly, elements in *Ephémère* can also appear and almost disappear. There should be as much activity below ground, in the roots below as above – the same flowing transformation, perhaps more at night. In winter there is no activity – a dormant period – more flux in spring, then summer, a dying down in fall. The symbolic doorway should be more ephemeral, like a reflection one can enter.

May 23, 1996 Lab notes:

I look at video tests of animated texture maps on a stream and rocks, very mesmerizing. It looks like snow, like classical Chinese landscape paintings: transparent layers upon layers when the foreground rock is close. John is now using individual point light sources [rather than ambient] so the rocks change in light and colour. In this example today, the rocks are sufficiently vague and abstract, more like an ink wash than objects. As the light changes, the rocks become blood-rust coloured and, in their ambiguity, suggest interior body organs. Also by night, there is no colour, only black and white and gray, which shifts perception into another zone.

[At this early stage, we were attempting to explore all possible ways of creating flow, flux, and transformation. This included working with flowing particles, transformations of scale, animated texture maps, cycles of colour and lighting etc. I considered this part of the research our way of developing the "vocabulary" for the work. For example, note the reference above to rocks suggesting interior body organs. These were to become a major aspect of *Ephémère*, as the realm of the Interior Body.

The reader may notice that I will refer to "classical Chinese landscape paintings": what interested me in such paintings was primarily their transparency and ambiguous spatiality, whereby, as explained by Cheng, the intent was to "create a relationship of *open reciprocity* between the subject and the objective world"; and where, "Because of the disruption of the linear perspective by emptiness within the pictorial realm, we once again note this relationship of reciprocal becoming between humans and nature within the picture, on one hand, and between the

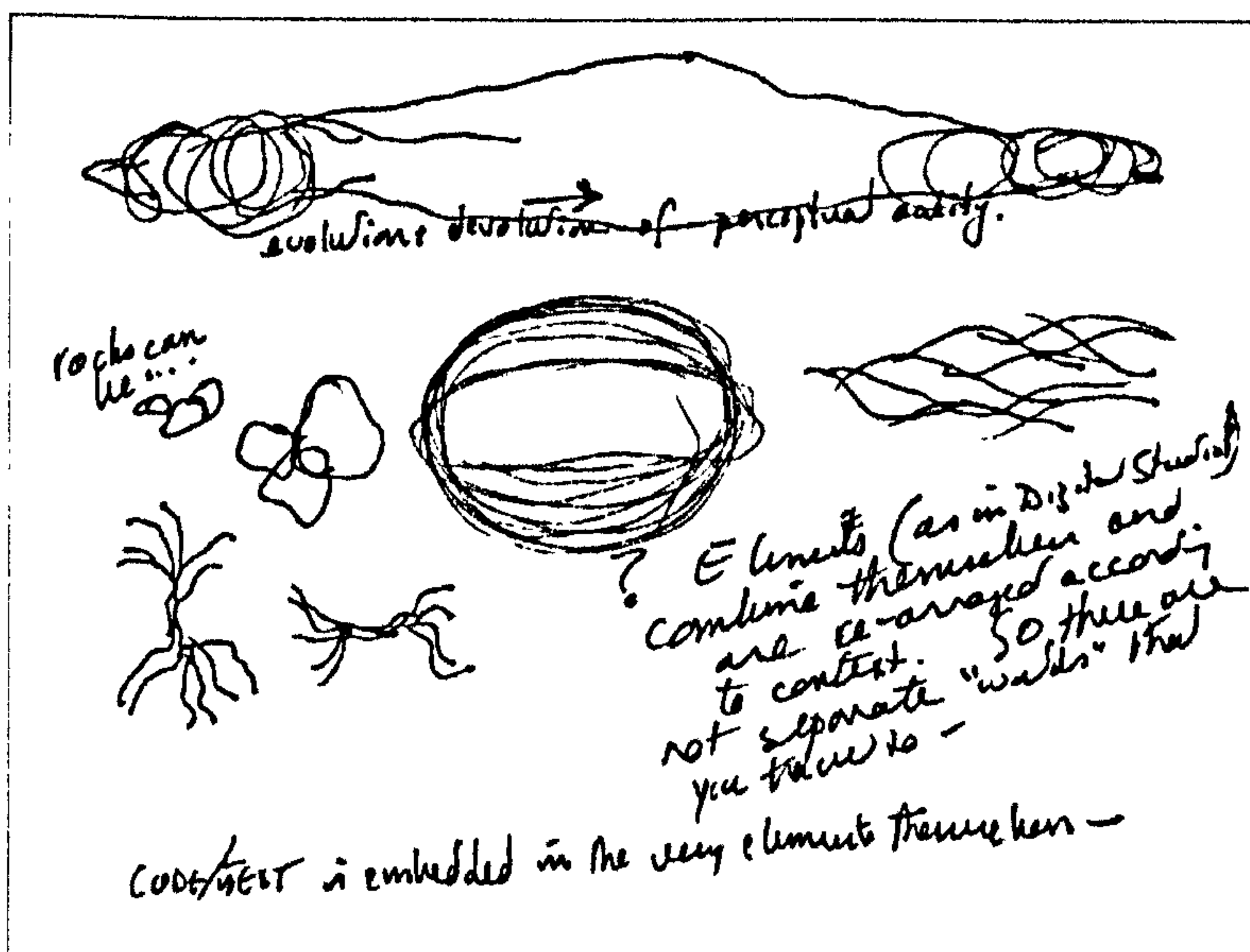
onlooker and the picture as a whole, on the other".⁵ This idea not only recalls my concept of the doubled point-of-view discussed in context of painting in Chapter III, but also the Buddhist concept of the *interpenetration* of interior and exterior introduced through Izutsu in Chapter I. The reader may recall that I have also referred to such paintings in Chapter II in context of Casey's discussion of Northern Sung paintings; and alluded to them in the *Osmose* white paper when quoting Norman Bryson on Nishitani in "The Gaze in the Expanded Field": I will briefly return to Bryson's discussion of 15th century "Ch'an" painting (*Ch'an*, Chinese; *Zen*: Japanese) in context of discussing the transcendence of the frame when using an HMD in Chapter VI.]

May 27, 1996 Lab notes:

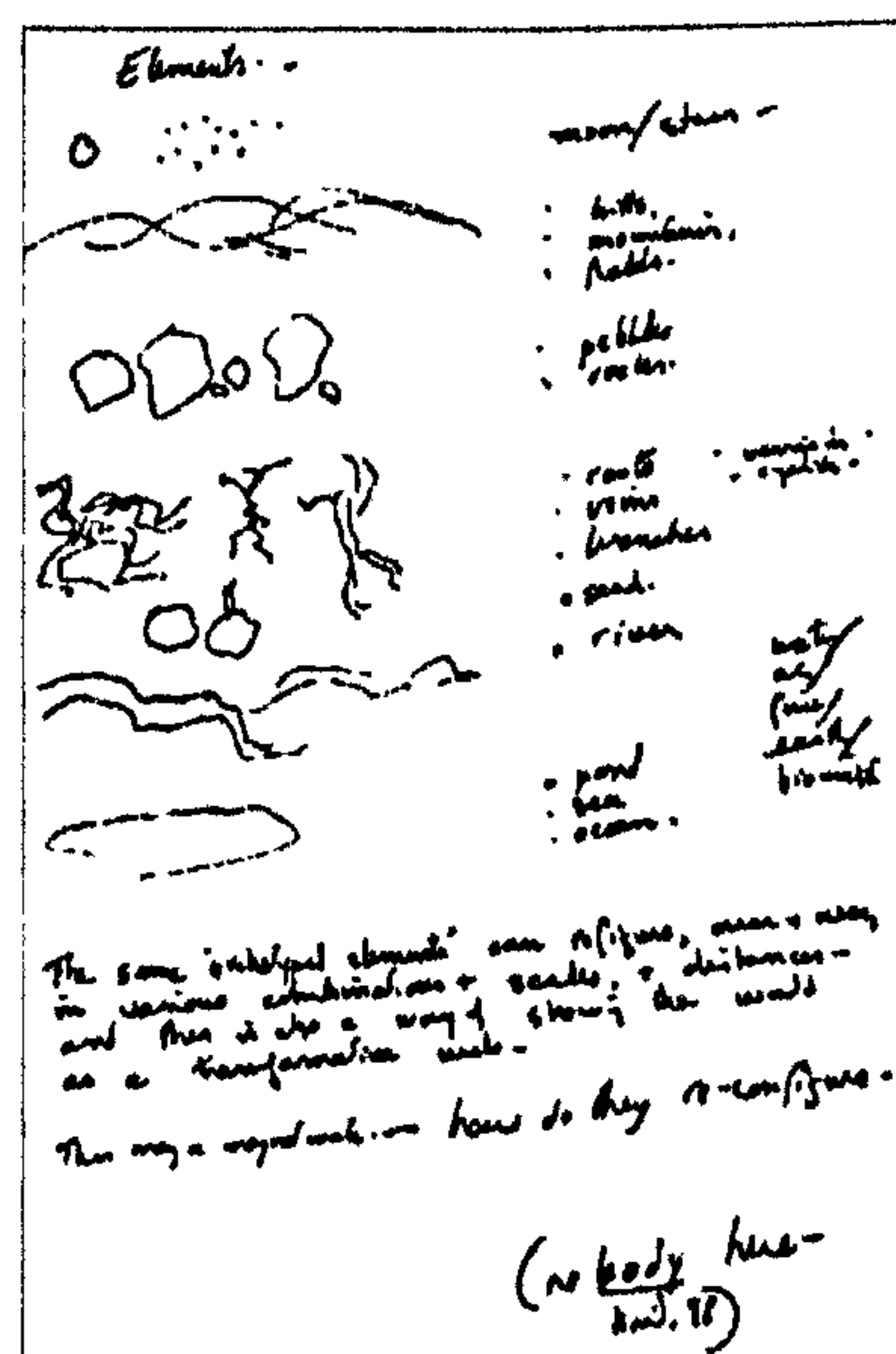
Perceptual relativity & mortality: A way of doing this is to bring in mortality/life span (as a linear flow). At both beginning and end, an obscuring veil of retinal/interior body textures could take precedence. Thus, the *interior body* reality takes precedence over the external world. This mortality/ephemerality continues the theme of *Osmose* but takes it further. In this way, the work could express the inescapability of individual mortality, the finitude of individual passage through a numinous, flowing world. Each life then blooms and ebbs, a mirroring of the rhythms in the world. *You are born into the world and you die out of it.*

[The theme of ephemeral life passage and mortality – which I first explored in the early '80s and revisited in *Osmose* with its ending intended to suggest a gentle dying *out* of the world – becomes an important aspect of *Ephémère*, and ultimately leads to its name change from *Numina* to *Ephémère*. As the following notes show, I return often to the theme of ephemerality, of life forms coming into being and passing away, all in an attempt to represent the flux and flow of life.]

June 4, 1996



Re-combining Elements
Ephémère Working Notebooks, June, 1996



List of Elements
Ephémère Working Notebooks, June, 1996

⁵ Cheng, 37-38.

Elements: combine and are rearranged according to context. (So there are no separate "worlds".) Elements include: hills, mountains, fields; pebbles, rocks; roots, veins, veins in eyelids of the perceiver, branches, seeds, river; pond, sea, ocean. The same "archetypal elements" can reconfigure, over and over, in various combinations and scales and distances; this is also way of showing the world as a transformative web. This may or may not work – how do they reconfigure?

[Throughout these notes, as the reader will soon see, I make frequent reference to the word "elements", often qualifying them as recurring, symbolic or archetypal. (See Chapter III, among the journal entries for the 3-D still Images, for previous discussion on this topic.) My use of the phrase "recurring" here refers to a particular constellation of Imagery that has evolved in my work over the past three decades, making up what could be called my poetic vocabulary, or "syntax of metaphors" to use Bachelard's phrase (as in "a poetic mind is purely and simply a syntax of metaphors"⁶). In my work, such metaphors are related primarily to nature and the interior organic body, and include seeds, roots, rocks, streams, body organs, bones, as well as openings of light. In this context, Colette Gaudin, in *On Poetic Imagination and Reverie*, writes that Bachelard suggests that "each poet, then, should give rise to a *diagram* indicating the direction and the symmetry of his metaphorical coordinations".⁷ Without having been aware of this suggestion, the *Ephémère* working notes are filled with such diagrams, all made with the intention of continually clarifying and reiterating (for myself primarily, although also for my team) my own metaphorical cosmology throughout the process of making the work.

I also want to point out that my use of the word "archetype" in the context of such recurring elements is meant in the Jungian sense, described by Gaudin in context of Bachelard's inquiry into poetic images as follows: "Strictly speaking, an archetype is *not* an image", but rather a "psychic energy spontaneously condensing the results of organic and ancestral experiences into images"; and as such, the word can be used to designate a "paradigm of a series of images".⁸ In keeping with the notion of archetypes, when these elements appear in my work, they do so not so much as images but rather as "symbols", whose potency for me is inexhaustible.

My use of the word "potency" here is deliberate, for as I have pointed out in Chapter III, my artistic expression of such elements seems compelled, involuntary: It is as if they arise or *manifest* of-their-own-accord (as in Heidegger's *poiesis*) from some psychic substratum, to use phraseology favoured by Jung and Neumann. As Jan Van Bragt points out in the glossary to Nishitani's *Religion and Nothingness*, the Chinese characters for *elemental* combine the image of "roots" and "wellspring" (both of which, coincidentally, were titles of my earlier digital images). This recalls George Steiner's comment, quoted in Chapter I, regarding Heidegger's belief that "the artist's work

⁶ Bachelard, (from *La Psychanalyse du feu*) in Colette Gaudin, *On Poetic Imagination and Reverie: Selections from Gaston Bachelard*. xxxvii. Gaudin further explains, for Bachelard, "... Imaginary life is not random; its description is organized on the basis of a system of symbols which Bachelard adopted partly from the Pre-Socratics, partly from the Romantics. But when he confronts the question of the source of poetic language, he opts for indetermination. The more reverie expands to the dimensions of the cosmos, the more the limits between the world and the subject become blurred". xxvii.

⁷ Bachelard, (from *La Psychanalyse du feu*, 213) quoted by Gaudin, xxii. I have not been able to find *La Psychanalyse du feu* in English translation, and therefore have relied solely on Gaudin's text.

⁸ *Ibid.*, xxxviii.

is a literal 'drawing up to light from the well of being', which well is sunk in the guardian earth" from which "the charged nothingness from which Being springs ('the wellspring')".⁹

Bragt also defines "manifestation" in this context as the "self-presentation of things".¹⁰ Such manifestation is discussed by Eliade in terms of *hierophany*, or manifestation of the sacred, as when "something sacred shows itself to us", ranging from the "most elementary hierophany – e.g., manifestation of the sacred in some ordinary object, a stone or tree – to the supreme hierophany ... In each case we are confronted by the same mysterious act – the manifestation of something out of a wholly different order, a reality that does not belong to our world, in objects that are an integral part of our natural 'profane' world".¹¹ This further recalls Eliade's mention of "numinous", in terms of that which emanates from the "awe-inspiring mystery", and as such seems resonant with the "suchness", "isness", and "thereness", introduced in Chapter III in context of painterly and poetic seeing.

Merleau-Ponty also refers to "elements", whereby he suggests that "Perception is not first a perception of *things*, but a perception of *elements* (water, air ...) of *rays of the world*, of things which are dimensions, which are worlds, I slip on these 'elements' and here I am in the *world*, I slip from the 'subjective' to Being";¹² and also in reference to Being and "the Imaginary", where he explains that in comparison to Sartre for whom these are merely objects or entities, "For me they are 'elements' (in Bachelard's sense), that is, not objects but *fields*, subdued being, non-thetic being, being before being – and moreover involving their auto-inscription..."¹³

I have never sought to analyze the recurring elements in my work for fear of lessening their mystery, and I do not intend to do so here.¹⁴ I will however list them, mentioning first those which relate to nature: e.g., landscapes with curved enveloping horizons (often contained in an ovoid-sphere); trees with branches *and* roots, some skeletally bare, others lush with leaves; subterranean realms of "under-earth" containing roots and streams; stones, rocks and boulders; germinating seeds as well as blooming buds; and flowing rivers. Other recurring elements refer to the "interior body", including translucent body organs, luminous shafts of bones, and blood streams; as well as floating veils of retinal flecks superimposed over the visual field, in reference to the subjective embodied act of vision.

Such elements are not intended as objective or scientific visualizations, but rather as suggestions of the body as subjectively inhabited and experienced from *within*. Together, these elemental groupings, of landscape/nature and interior body, express a primary theme of my work, that of the metaphorical *correspondence* or *co-equivalency* between body and earth. The intent to convey such correspondence is, as I have explained elsewhere, based on my desire to describe the

⁹ George Steiner, *Martin Heidegger*, 135.

¹⁰ Nishitani, *Religion and Nothingness*, glossary, 296; 299.

¹¹ Eliade, 11.

¹² Merleau-Ponty, working notes to *The Visible and the Invisible*, 218.

¹³ *Ibid.*, 267. Emphasis mine.

¹⁴ In this context, Gaudin writes that even while Bachelard references Jung's theory of archetypes, he tends to condemn psychoanalysis because of what he considers its excessively reductive causal explanations (xxiii), where the psychoanalyst, by "seeking reality beneath the fable, destroys the primacy of the image". xxxix. Furthermore, for Bachelard "It is only when they are taken up by great poets that old myths and words [and I would add, *images*] regain their significance. They must in some way be reactivated by that material imagination which gives life to the elementary *correspondence* between man and the world. For Bachelard, imagination must infuse a second life into familiar images, it must create '*metaphors of metaphors*'. xl.

underlying *unity*, not only between us and other living beings, but also between us and entities such as stones and rivers, all of which share the same "isness" or "suchness" as *physis*, as Being, presencing in the here and now.

Lastly, and somewhat apart, there is another recurring element in my work, also spanning 30 years: that of an luminous "opening", usually a rectangular doorway, symbolizing a threshold, or *passing through* – into life, or death, in keeping with the theme of life passage and mortality – or even, as I wrote in a journal entry on Sept 17, 1992, into "perception, into light, the doorway cleansed."

Over the years, my conceptualization of these elements has evolved, especially as I moved from painting to 3-D digital imaging, from thinking of them as two-dimensional representations to volumetric entities inhabiting three-dimensional space, and transforming through time. Eventually, as the *Ephémère* working notes show, I also begin to think of such elements as *recombining*, or *reconfiguring*. By this, I am referring to the same element being used in various spatial contexts to evoke multiple associations, such as, for example, a flowing stream being used to suggest a river when placed in a landscape *and* a blood vessel when placed in the body; or an ovoid-sphere suggesting a boulder in the under-earth *and* an organ in the interior body; or even a tree above ground being used to also denote a subterranean shaft of light. This notion, of "reconstellating" the same elements so that their meaning is context-based became an integral aspect of my thinking about *Ephémère*. As the working notes will also show, in keeping with such reconfiguring, and with the theme of metaphoric correspondence between body and earth, eventually the three-dimensional cg models we used for boulders and body organs became one and the same.

In addition, these elements in *Ephémère* are conceived as not stable or static, but as engaged in flux and transformation, as expressions of nature as *physis*, in terms of all variously coming into being, lingering and passing away. In this regard, the writings of Bachelard have also provided me with valuable insights into the archetypal aspects of the "material universe" of air, fire (flame), earth, and water, particularly because his work focuses on the *dynamics* of such elements, emphasizing their poetic, associational, and metaphoric nature.

Lastly, in this context, I want to mention Gaudin's comment that for Bachelard, "Poetry is a *poiesis* in the sense that it achieves – or *makes* – the dream of nature.^{15]}

¹⁵ *Ibid.* xlvii.



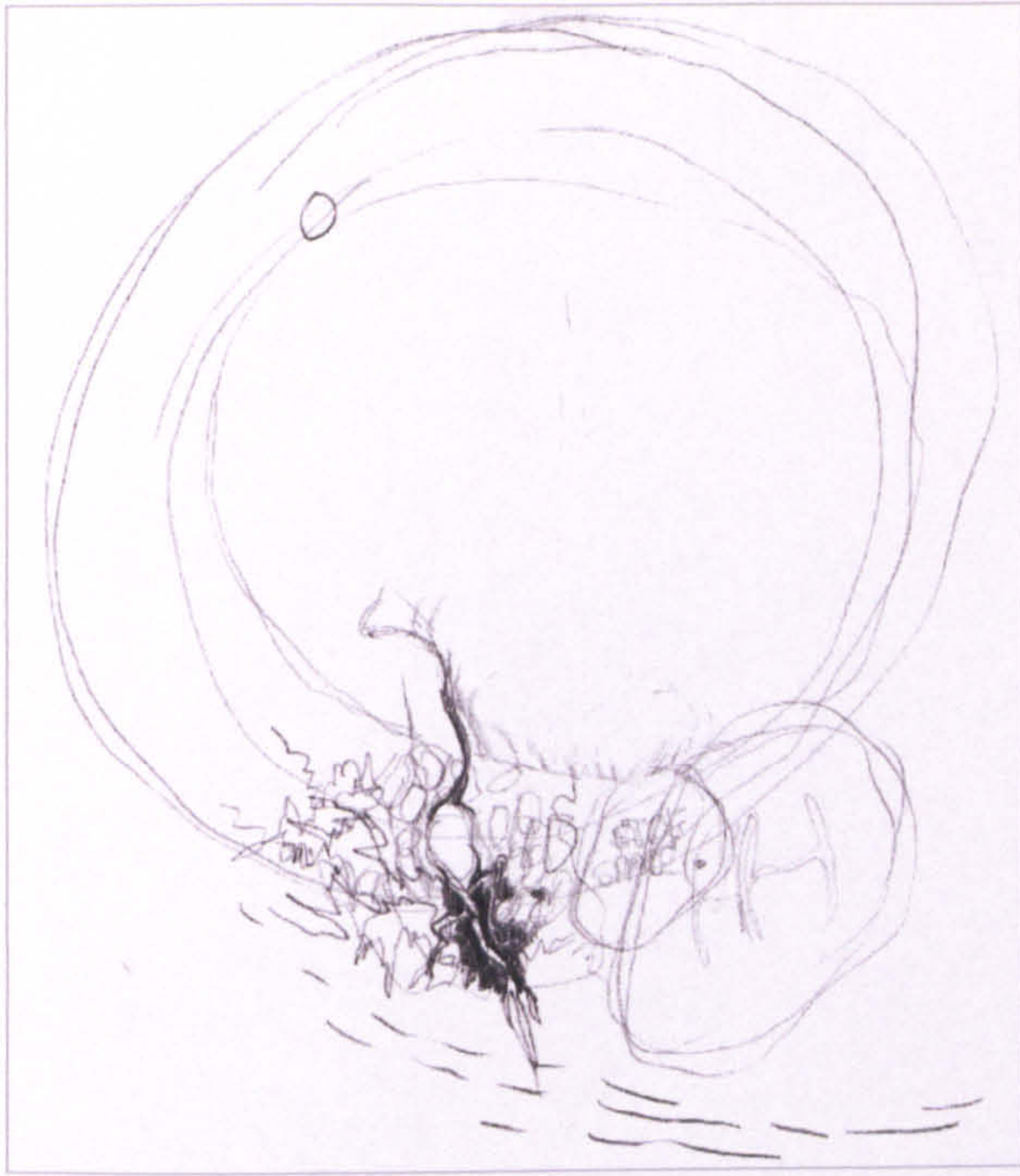
Landscape (as Ovoid-Sphere) I
Ephémère Working Notebooks, June 5, 1996



Landscape (as Ovoid-Sphere) II
Ephémère Working Notebooks, June 5, 1996



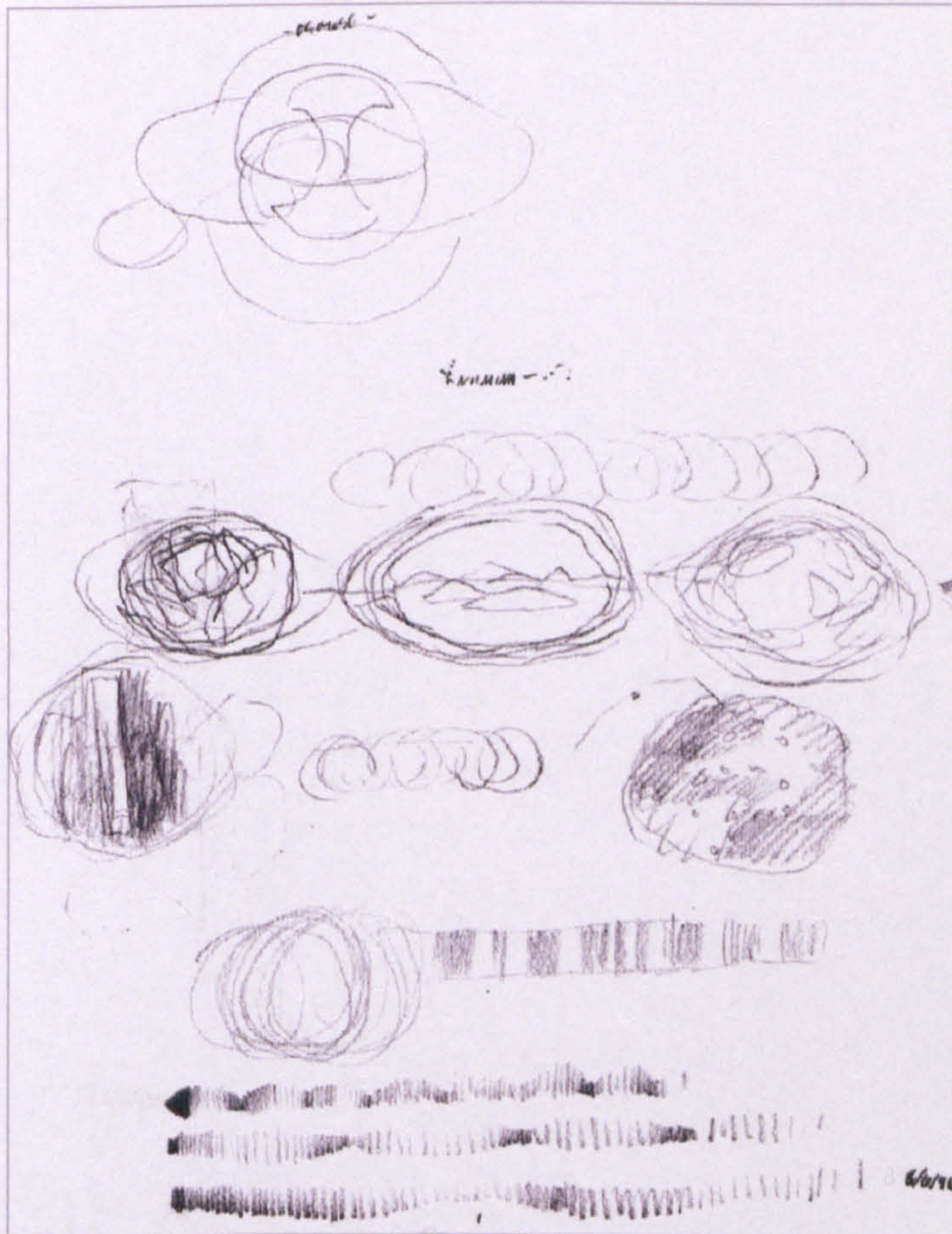
Landscape as Ovoid-Sphere with Embodied Perceiver (Thighs and Belly)
Ephémère Working Notebooks, June 5, 1996



Germinating Seed with Enveloping Sky I
Ephémère Working Notebooks, June 6, 1996



Germinating Seed II
Ephémère Working Notebooks, June 6, 1996



Ephémère Spatio-temporal Structure with Ovoid-Sphere Landscapes
Ephémère Working Notebooks, June 6, 1996

June 7, 1996 Notes from the country:

Fog, obscuring the horizon so the sky touches earth, softening all edges, luminous fog: In fog everything floats. At night, the fog is luminous, no colour, all tones of gray to black. *Everything is pulsating with a very fine texture of dots – rods of the retina joining everything together.* Auras of light around trees. Trees as black floating silhouettes. Fog eroding edges. Space is full, a container of luminous, wet fog.

Tonight on the land, there is the most unbelievable luminous ebbing, flowing fog. I go out at 10pm and walk, mouth agape, incredulous. The fog dematerializes everything, everything is joined with everything else, floating. It is hallucinogenic, creating a sense of delicate vertigo. Very similar to being deep in the sea, enveloped by oceanic blue. The lack of colour, everything in tones of gray, the ebb and flow of the fog, glowing then subsiding... Form dematerialized, form dissolved. Huge areas in the visual field that can not be read, can not be recognized. Here, so similar to Turner's best late paintings, and to certain styles of classical Chinese landscape painting. Here is the key to the work: for on a night like this, walking among shrouds of apple trees, everything – the trees, shadows, lane, stepping stones, waterfall, windows – all become luminous, numinous, my head spinning in euphoria, speechless, in absolute wonder.

So in *Ephémère*, the key is the fog, the dematerialization of form, the luminosity, the perceptual interplay at this exquisite level of darkness and light, where the eye can barely see and the mind begins to fall for there is nothing to rest on. In *Ephémère*, the black and gray of night should be as rich as the exquisite warm violet, rust, crimson, of dawn and dusk, and the silky pale creaminess of daylight which, fog-like in its brilliance, also obscures, obliterates, dissolves. In such conditions, there are no discrete entire landscapes, but only elements in space, three-dimensional compositions that change from every point-of-view. There is no edge to such a "landscape": the edges are drowned in the luminous fog or in shadow, and the fog advances and recedes. When the fog comes in, there certainly is no mountain, space is not "out there" on the curve of the earth: it embraces, it *strokes*, encloses, close upon the skin. I have not been so transported by landscape, since being on the coast of Brittany and having the first ideas for *Osmose*.

Tonight, all of *Ephémère* is contained here, all around me: not the clarity of seeing 50 miles, no, all that is doomed to illustration: no, here, in the *ambiguity, the fluctuation, dissolution, the embracing* of fog is the key to *Ephémère*. Fog can overtake transparency in fact, as a means of dissolving form, for merging elements together, for breaking down inside and outside. Fog not only dissolves and dematerializes, it frees elements from gravity and unbounds them in some way, so they begin to float, and I too, without reference to subject/objects, without clear vision in the semi-darkness, with my own body's retinal patterns projected on everything. Then I too become unbounded and begin to float, and experience a delicate vertigo, a release...

[In addition to making notes during lab meetings in Montreal, I also did so outside of the lab, particularly in the Québec countryside on the land which I have named Reverle. As these notes show, in the countryside I often wrote at length about my perceptions of natural phenomena such as fog, referring to actual phenomena I was experiencing at the time, or had experienced only hours before. Often, during the act of writing, I referred simultaneously to actual phenomena and ideas for the envisioned virtual environment, sometimes seamlessly describing both in the same sentence. Thus from the very beginning of the conceptualization of *Ephémère*, the actual and the imagined are intertwined, reflecting a *slip-sliding* between the virtual and the real.]

June 8, 1996 *Notes from the country:*

Fog: In the fog, forms are dark against light, even at night the sky is luminous. Water running, water falling, is also bright in the darkness. This approach would be quite different than *Osmose*, where the luminosity was in all the elements of trees, roots, rocks etc., light and bright against black space. In *Ephémère*, space itself is luminous and the elements are dark, dissolved by the luminosity of the space. In the shifts from day to night, there would be shifts from colour, blue/green/gold to violets/oranges (of dawn/dusk) to gray/black/gray. So not only do we have a constant transformation of light to dark, but also of colour, and also of colour to black/white. In traditional Chinese landscape painting, everything is enveloped by luminous light atmospheric fog, so all trees and boulders/mountains were dark form against light atmospheric space. Similarly, the late paintings of Turner were enveloped in foggy, dazzling light and all forms dissolved by it. [...]

June 11 -19, 1996

Not how many worlds, but rather how many elements are *recombined*. Don't journey to see things, but rather, as the immersant moves, things change. After visiting an exhibition of Chinese scholars' rocks, "worlds within worlds"... I realize that the anchor of *Ephémère*, the central point, if not a tree as in *Osmose*, really should be a rock, a boulder, a stone. *A still point amid the flux.*

July 4, 1996 *Lab Notes:*

I look at our tests of fog, with moon and sun changing. The light should flow, so its effects are never the same, each day, each night, all fog, is different and unpredictable within a certain range. Very painterly, like the Nuns paintings I did in 1984, recalling the semi-transparent and semi-abstract rocks at the edge of the horse/rider painting in the Nuns series. [See reproduction of painting detail.]



Transparent Rocks & Stones 1983-84
Detail from Rider at Dusk: Nuns Series
Oil on wooden board



When Stones Fly Up 1975
Ink wash on paper

July 21, 1996

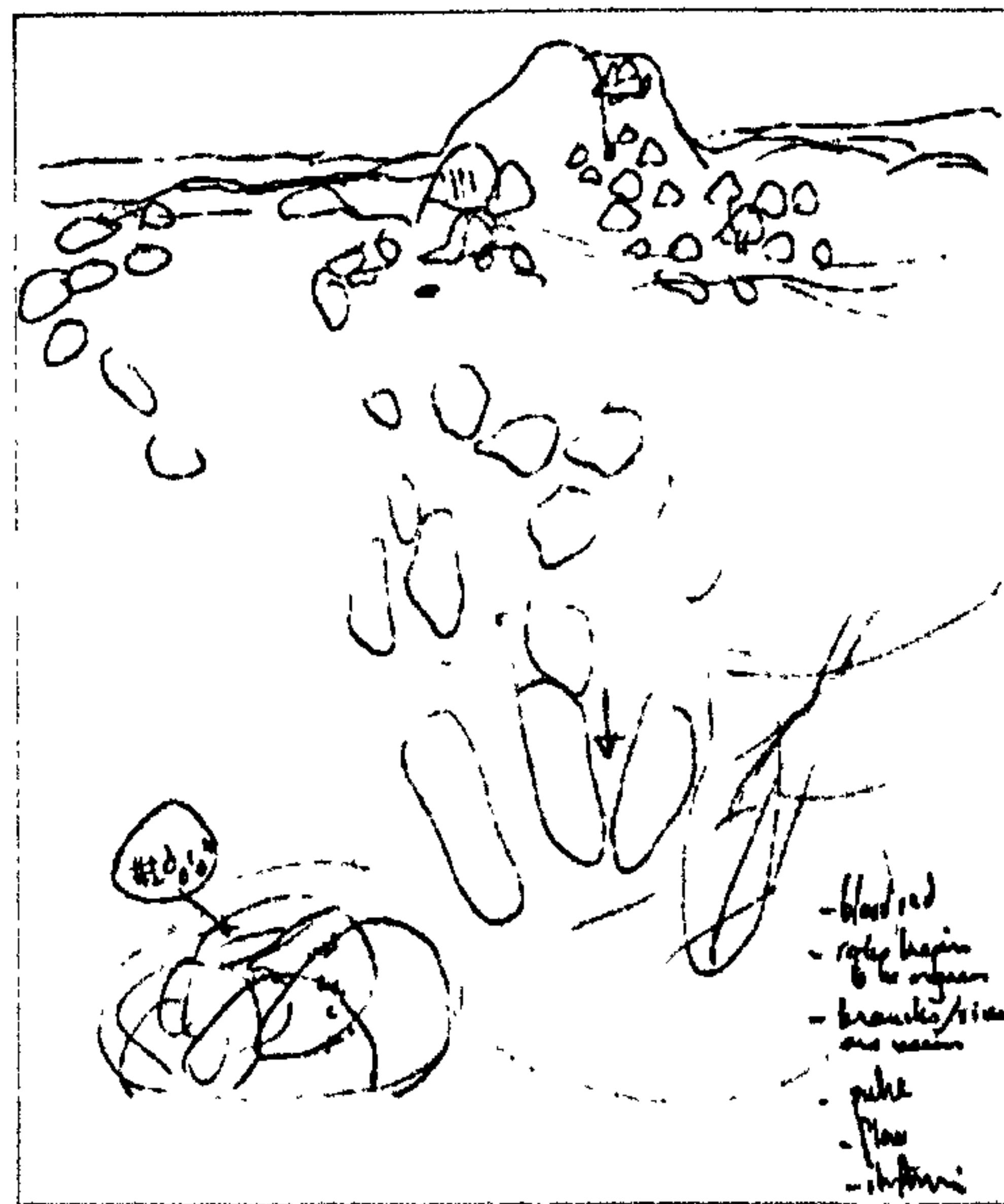
The Rocks/Boulders are the anchors, all else is in flux, closing and disclosing, retreating and coming forward, hiding and revealing. [...] The goal of the work is to create an existential vertigo, not a narrative, by a stripping away to an existential level of being, a spinning in slow motion. The river pulses, and throbs, like the creek on the mountain, it trickles, then becomes torrential, and never ceases to flow, and the rocks are the ground, slowly being worn away by water. Their stillness is thus illusion.

Like the transparent ink-wash painting, of rocks and flowing water, that I made in 1975. [See reproduction above.]

We need alternatives to voluntary self-conscious Immersant movement, such as force-fields etc. Break predictability: I.e. In *Osmose* one had to move (navigate) to see the work, here the textured layers could affect the Immersant instead. Recalling Heidegger's bridge: by *not moving*, it reveals, reflects, *discloses*, the movement all around it, the light changing etc.¹⁶ Not everything upfront, but instead, things *disclose* themselves to the Immersant.

July, 1996

Blood red. Rocks as body organs. Branches/rivers become veins. Pulse. Flow. Rhythm. Repeat the same motif: the same cg models can be recombined, reconfigured, in various contexts. *It is their context that gives them meaning.*



Landscape with Rocks and Under-Earth
Ephémère Working Notebooks, July, 1996

Aug 16, 1996

Temporal Structure: Begin *Ephémère* with immersion in the white of winter. A progression: winter (day night day night); spring (day night day night); summer (day night day night); autumn (day night day night). So when Immersants enter, *they are entering a stream of time* – marked by changing light, and colours and rhythm, as if the immersive journey is on a river, which carries them, and after a certain length of time, deposits them back on the shore... So, during the entire journey, the light should be transforming, fluctuating, and the day/night cycles revolving, and seasons changing.

Winter - dormant, all is still, quiet. Snow falling, hushed, sometimes wind. Black/white.

Spring - feverish activity. High torrential water. Births. Insect drone and birds.

Summer - insect drone and birds, fewer. Water trickle, except rain/lightning storm.

Fall - less unless activity, falling into dormancy. No insects, few birds. Wind, leaves in wind.

Nights - black and white, no colour. More reliance on sound. The fog. Shadow. Water is reflective.

Days - light is directional, not only ambient. Light also dissolving form, diffuse, fog shadow.

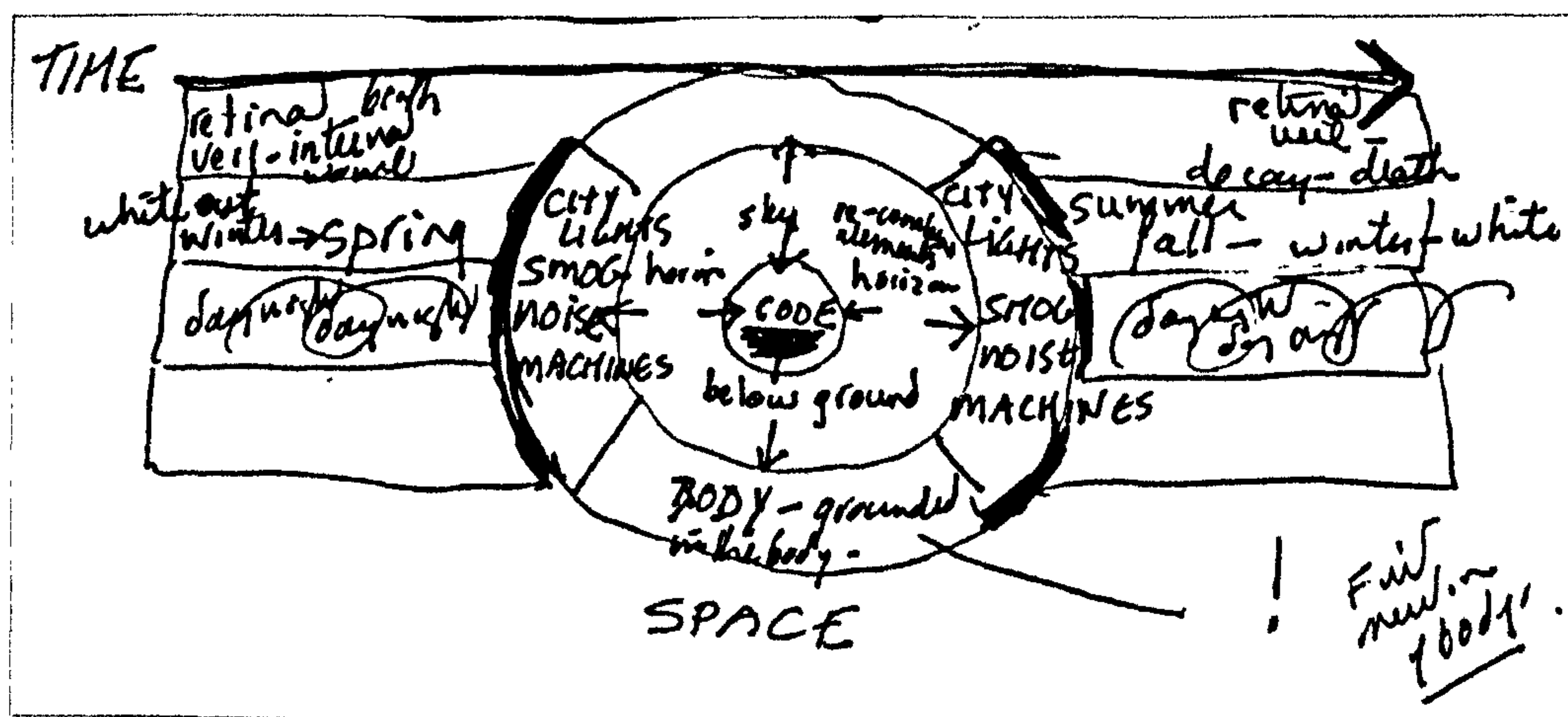
Dawn/dusk - warm violets, rust, crimson.

¹⁶ Heidegger, "Building Dwelling Thinking", 152-155.

Transformation: form – appear and disappear in fog; shape – landscape evolving over time and point-of-view; light – cycling day/night, never the same; activity – rhythms day/night and seasonal; colour – day/night, seasonal. Above ground/below ground: there is much activity below ground, perhaps even more at night. Water/air/earth/wood. Fire consumes, razes across the landscape periodically, fresh growth after.

Recombining Elements: Same few elements recombine and rearrange instead of discrete worlds: light – light sources; fog – space is luminous and full, and dematerializes form; strands that are lit; rocks – as unchanging anchors, everything else flows; stream – that transforms, stream, pool, etc; lightning / rain / snow; code as a substrate of texture, fine grained and luminous.

Temporal passage: This *is* a narrative. From winter to spring to autumn to winter. From birth to prime to decay to death. Blooming to ebbing. From the interior body (retinal veil, inside the womb, no differentiation) to the external world (illusion of clarity, distance, difference). Interior body retinal veil – blindness - return to earth, perceptual clarity fades.



Spatio-temporal Structure of Ephémère
Ephémère Working Notebooks, August, 1996

August, 1996

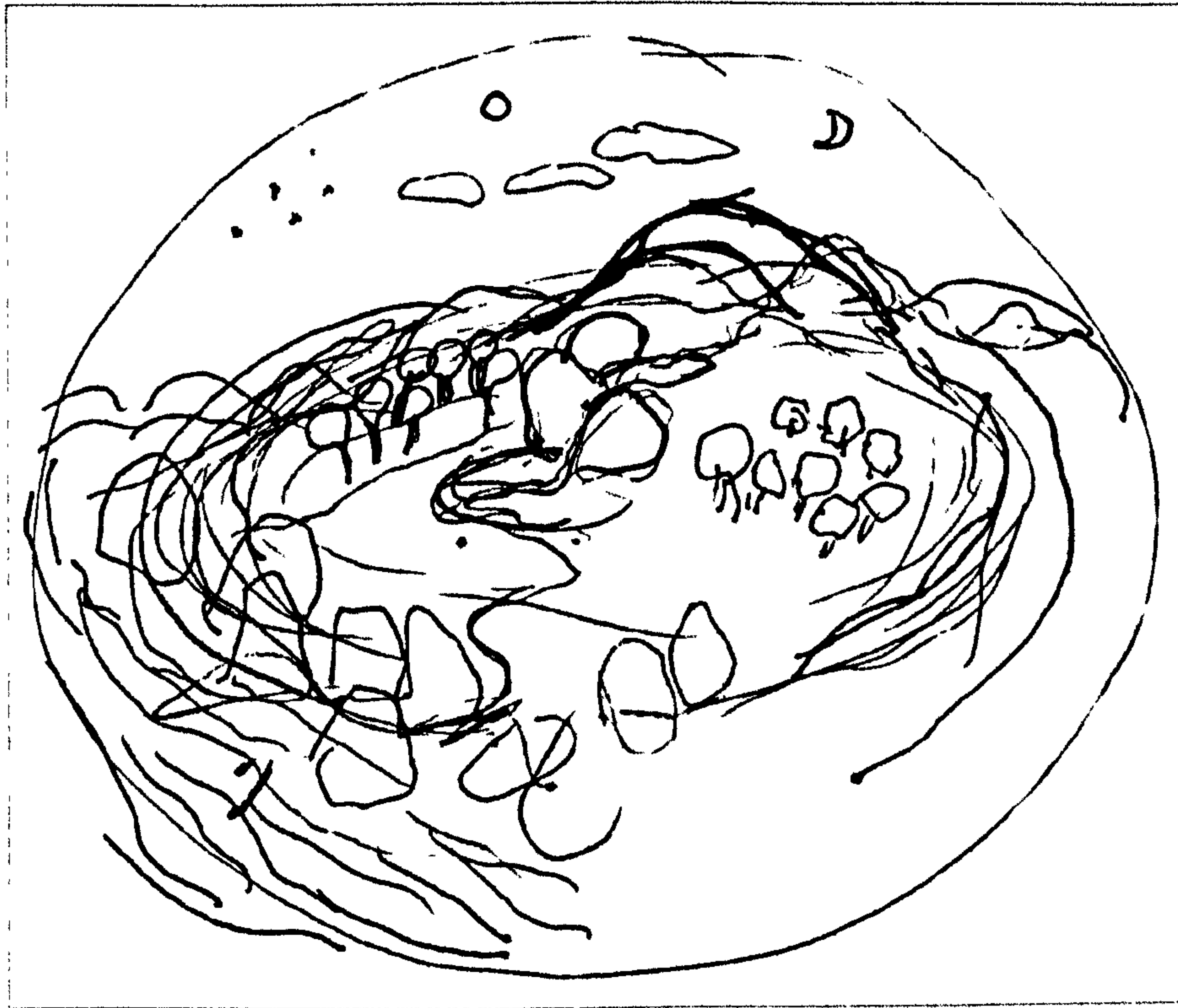
A world within. Garden *inside* the machine/city:

Not a wilderness, not an Eden, but threatened, fragile, finite, surrounded;

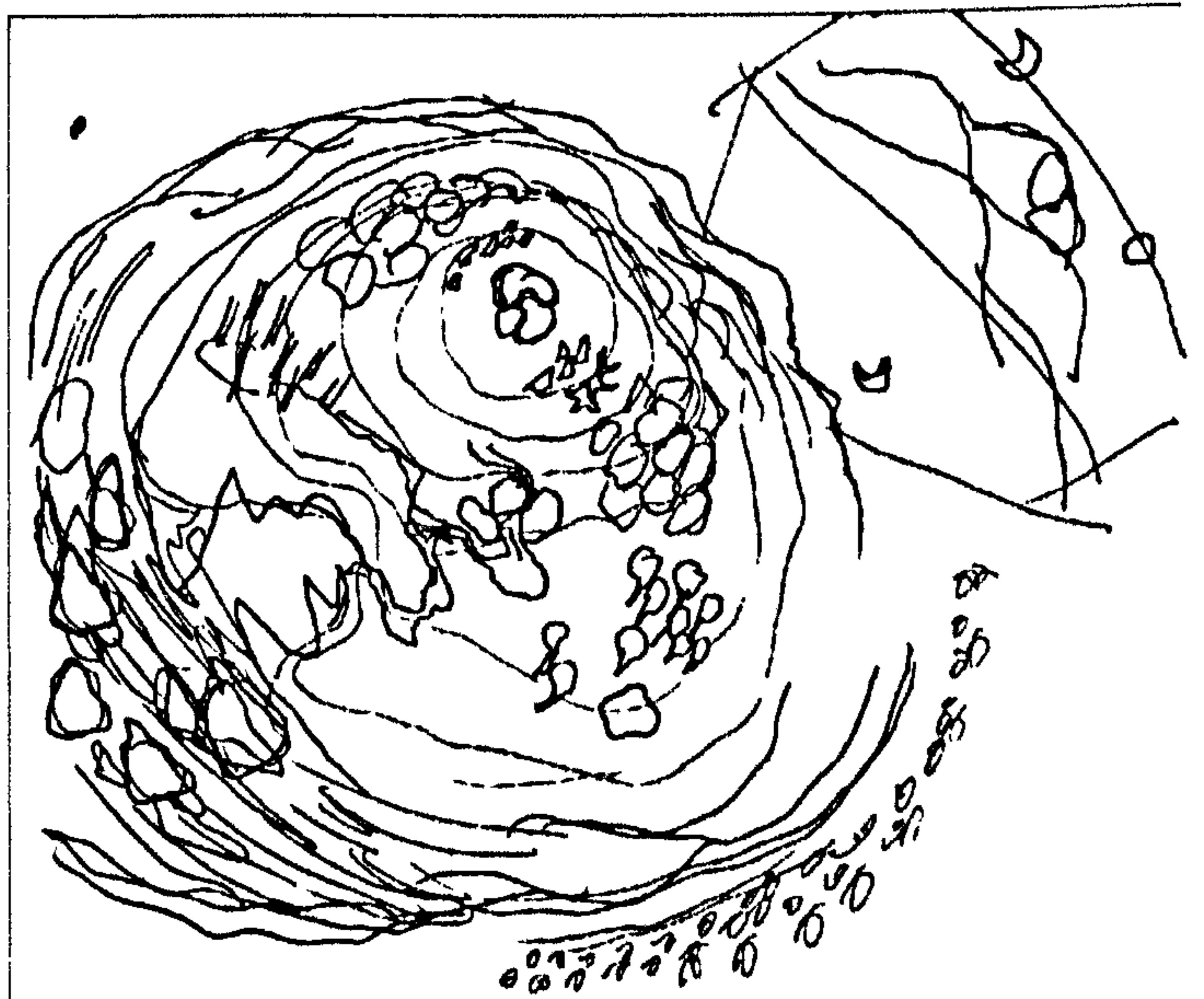
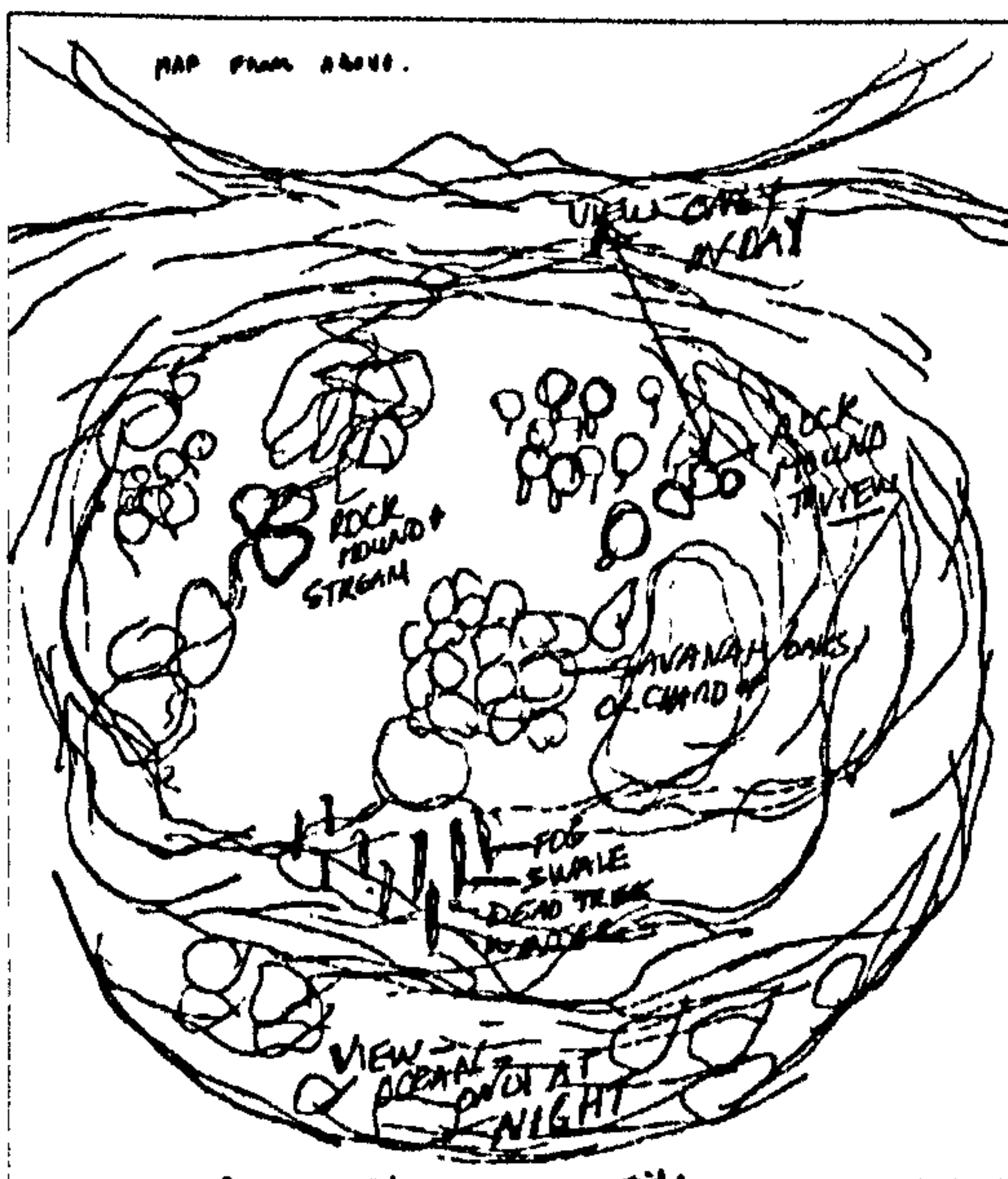
Not an escape, but a revealing of what we are losing, the ephemeral, luminous rhythms.

Noise of machines. Brown fog. City lights at night.

When the Immersant goes closer, the noise of machines drowns out the sound of insects, birds, water, wind.



Ephémère as Landscape, I
 Ephémère Working Notebooks, August, 1996



Ephémère as Landscape, II, III
 Ephémère Working Notebooks, August, 1996

August, 1996

Cannot go back to find places – for example, the winter swamp exists only at the beginning, in winter fog. White, fog, winter, transparent, no separation between earth and sky.

Remember the watercolour I made 25 years ago, of becoming lost while snowshoeing at dusk across a winter swamp, in thick fog, among dead trees – a perceptual vertigo there: I remember, I came to that clearing on snowshoes, had no sense of direction, and the vertical gray tree carcasses floated in the fog, in the white light of winter. [See reproduction below, along with mixed media study from 1986.]



Winter Swamp 1973
Watercolour on paper



Winter Clearing (Swamp) 1986
Mixed Media on paper

Here then, is the opening (prologue) of *Ephémère*, for in such a place there would be no motion, in winter all is suspended and still – begin in a landscape of death (and rebirth) created by beavers, an "opening" in the forest. And this, a place of dead trees, could be a reference to what is happening to nature, after acid rain, desertification etc. Also because of structure of the work – the simple verticality – this Winter Swamp can act as an orientation place. Then in comparison, afterwards, there is flow, growth, green, etc, and it has all started from this.

Aug ?, 1996 *Notes from the country:*

Ephémère is no longer only a dreamlike mirage of light and transformation – it literally is an embodiment of "the garden in the machine": *Ephémère* is a lament. *Osmose was longing, Ephémère is a sorrowful lament.*

Structure: The opening/prologue: the Winter Swamp. White fog, gray trunks of dead trees, broken branches, trees are like ghosts, they are relics. Snowing – the only motion is snow, all else is still, and silent, like twilight into dusk and night. It is possible to move away into the surrounding landscape of fields, of snow, bleak, and a black sky very harsh with bright stars. Nighttime, all is dark except for stars, and a haunting melody. No motion at all, everything is still.

At dawn, one finds oneself above ground (in fog, in spring with a hint of green, and blue, so pale) in the Landscape, in meadow or forest, all bathed in white luminous fog. Here, there is motion, with budding and blossoming and flowing (for the stream has thawed) and the sounds of birds and insects and animals. At day: there is still fog, (summer) one can wander, and the shapes change. There are the trees, flowing green, and meadows, more flowing, the unseen presences of insects, animals etc. Dusk and night: there is still a ghostly fog, so tree trunks and rocks are dark silhouettes. Certain rocks and boulders cause time and light to change, and seasons to speed up somewhat, because they are so still.

Numina - an opera of landscape

characters:

- shifting, changing light, *creeping* - code - text
- darkness of night
- fog - interactive
- snow - rain - wind
- creek, stream - lake/sea flow, seasonal weather pulses, meandering
- rocks, boulders, mountains, pebbles, stones
- trees - dead trunks, orchards/savannah/plants - roots forest group present
- insects - fish - reptiles
- birds
- mammal - creature - ghost-like, responsive, interactive entities that represent
- seeds - meadow - recurring clearings, dividing paths

scenario:

- winter to spring to summer to fall to winter
- birth to death
- cycling day-night, various rhythms depending

sets -

- coldweld
- swamp
- savannah/rockland
- meadow
- forest
- mountains
- shoreline
- underground?
- upper realm

Numina [Ephémère]: Opera of Landscape; Various Scenes
Ephémère Working Notebooks, August, 1996

Numina [Ephémère]: an opera of landscape. Characters [in the opera]: shifting changing light; code/text; darkness of night; fog, interactive; snow, rain, wind; creek, River/stream/pond (flow, seasonal and weather pulsing); rocks, boulders, mountains, pebbles, stones; trees, dead trunks, seeds, orchards, plants, roots; meadow, recurring clearings, dividing paths; responsive, interactive entities that represent insects, birds, mammals as ghost-like creatures. Scenario: winter to spring to summer to fall to winter; birth to death; cycling day-night, and various rhythms depending... Sets/scenes: Winter Swamp; Forest Landscape; Under-Earth; Interior Body and bones and blood; upper realm?

Ending: Towards the end, everything (wherever one is) becomes more abstract, loses recognizability as a retinal veil begins to project itself, as the Interior Body takes over – perceptually – as the cones and rods of the retina misfire, and perceptual acuity dims. And the Immersant is returned to veils which close out the world but "enclose" the perceiving self. Or could it be machine culture that takes over and overrides, the noise of machines drowns out all else. No, I want people to leave full and luminous, not agressed.

Scenes: Veil of code; Winter Swamp; Rocks/Boulders and stream and pool; Landscape: Under-Earth (again); Interior Body; "Overworld" (above, can see everything as if one has left the body, a fine line, a strand, connected so that one could go back, could follow it to return); retinal veils etc. Ending? veil, *dying of the light..*

Doorways, "openings": Winter Swamp is the "opening" into the life-world, it is a prelude to life; point-of-view from near Rocks/Boulders, which act as contemplative openings, to speed time and shift seasons perhaps? The one then leave Rock/Boulder to enter that time (boulders transcend time.) *A flash of light, or a reflection, signals a doorway, signals an Opening.*

[The mention of "doorways" and "openings", already appearing in the working note of May 14, 1996 is a reference to a symbolic element which first occurred in my in 1973, as a small painting of a doorway in the subterranean earth, which if I remember correctly was intended to represent the last glimpse of life itself from the depths of a grave. This same element also occurred in other images I made during the '80s, and is discussed in the journal entries dated Sept 17 and Dec 6, 1992, regarding the digital images in Chapter III.



Window/Grave 1973
oil on canvas



Denial of Entry 1985
oil on canvas



Pregnant Future 1986
oil on wooden panel



Tree & Doorway 1986
oil on masonite

This element also made its appearance in *Osmose* as the Life-world through which the immersant can enter to exit and then re-enter the world, *and* as a small luminous window which follows the immersant. (If the immersant tries in turn to approach the small window, it will retreat, leading them on the journey of the previous person.) The doorway is also apparent in the luminous opening/shadow silhouette of the physical installation of both *Osmose* and *Ephémère*.

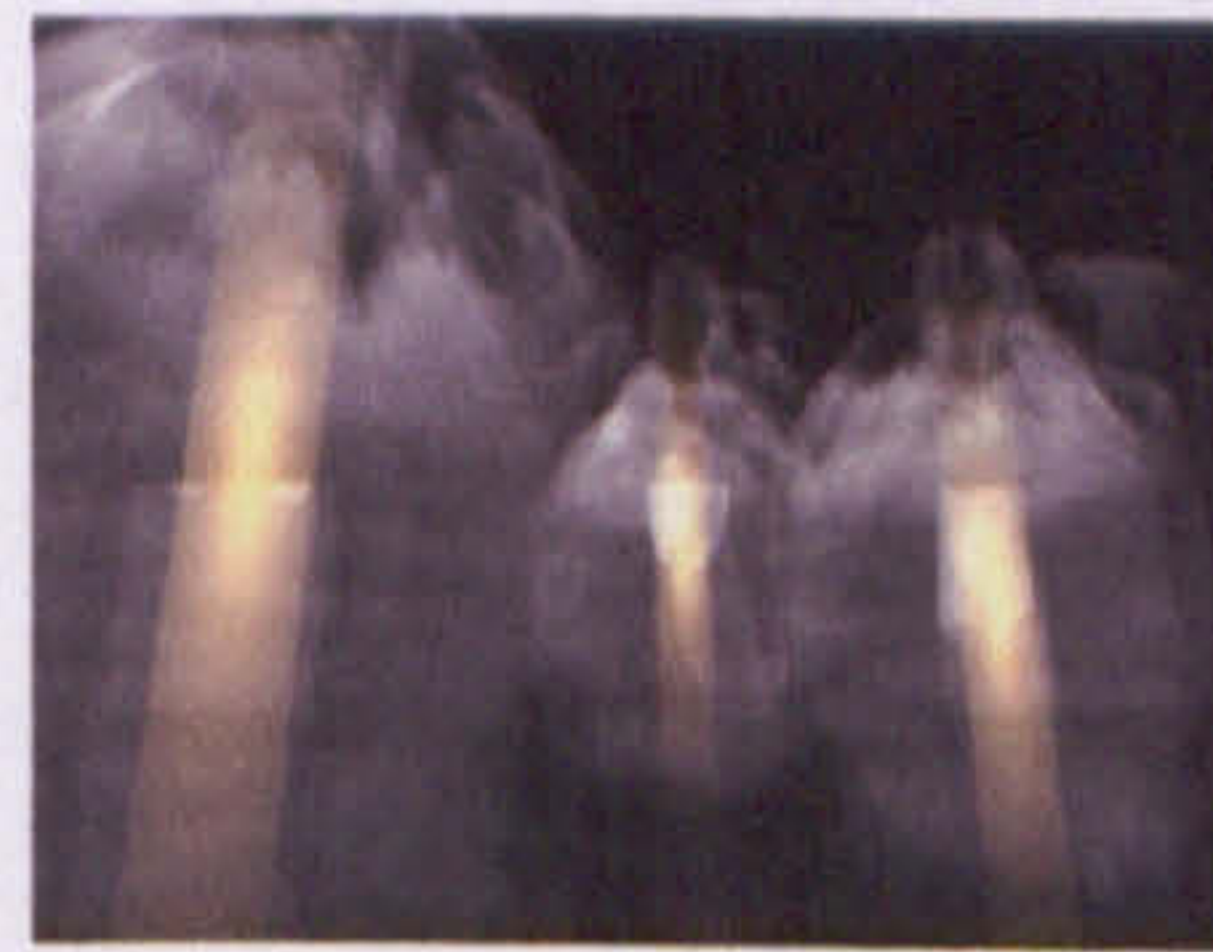
In *Ephémère*, the concept of the doorway which "opens" finds its expression in both the germinating seeds, and the boulders or rocks, which become receptive to the immersant (when approached with an attentive gaze) allowing entry respectively into their luminous blooming, and interior landscapes.



Window element & Tree 1994
Frame capture, *Osmose* test



Immersant in Doorway
Shadow-silhouette screen



Seeds 1997
Ephémère test



Interior landscape in Boulder
Ephémère, 1998

I have recently realized that my notion of rocks and boulders containing interior landscapes accessible to the immersant through focused attention, recalls Izutsu's description of expansive awareness in Zen (discussed in Chapter II, particularly in terms of the external world being experienced in a different dimension as an "internal landscape").

I have come across a very startling example of boulders in a similar context: during a visit to Bhutan in the spring of 2004, the Bhutan Buddhist monk/Oxford scholar, Karma Phuntsho, explained to me that the throughout the country of Bhutan, there are giant boulders which are doorways (*nay go*) into hidden/secret valleys (*be yul*). Such *nay go*, when approached by spiritual adepts, will "open" to reveal secret landscapes within, existing in another – dare I say virtual? – dimension.]

Interaction: Perception of time and space depends on location; day, night, seasonal cycles speed up; near boulders – causes flow to speed up transcending linear time (can Immersant venture away?); Immersant speed; fog comes in and obscures; regarding the coexisting of veils of worlds, one recedes as another comes forth. Interaction depends on: location (?); time of day/night (?); time of year/season; speed, duration; direction; *not* touching but rather proximity, passive waiting, synchronous timing; gravitational pull (field of Influence?); rapid actions will cause activity to slow or become less visible; when Immersant slows, certain elements will come to life. Causes are not linear but relational, conceptual, associative.

Aug ?, 1996

Numinous. world as luminous, flowing web. Awareness of a being in and dying out of the world.

Temporality: *spatial metaphors to be replaced by temporal ones.* Make time and space fluid. Have worlds coexist like veils, that manifest as ebb and flow in response to the Immersant. Some realms (veils) however will never be dominant but remain peripheral, i.e. one can never enter.

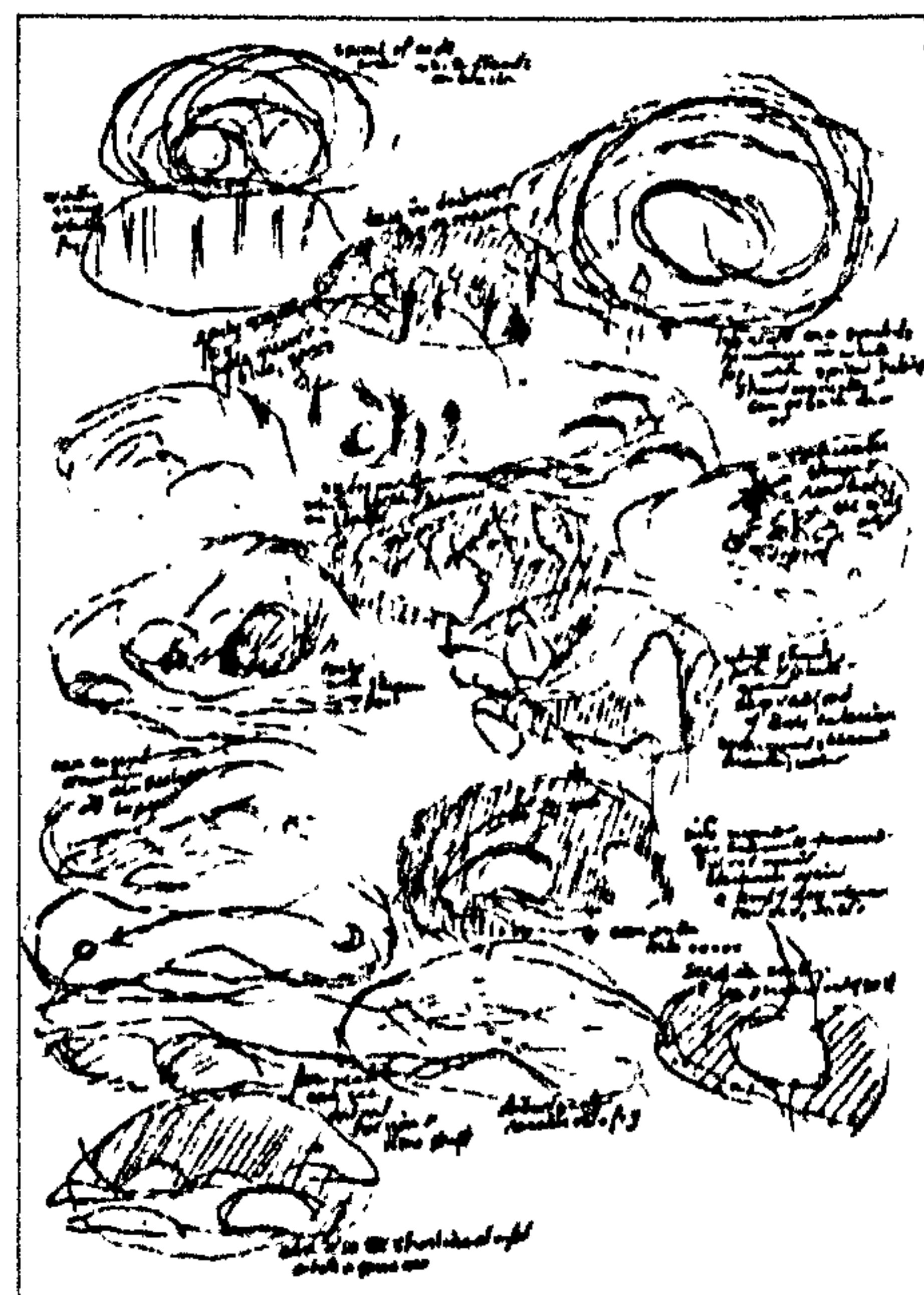
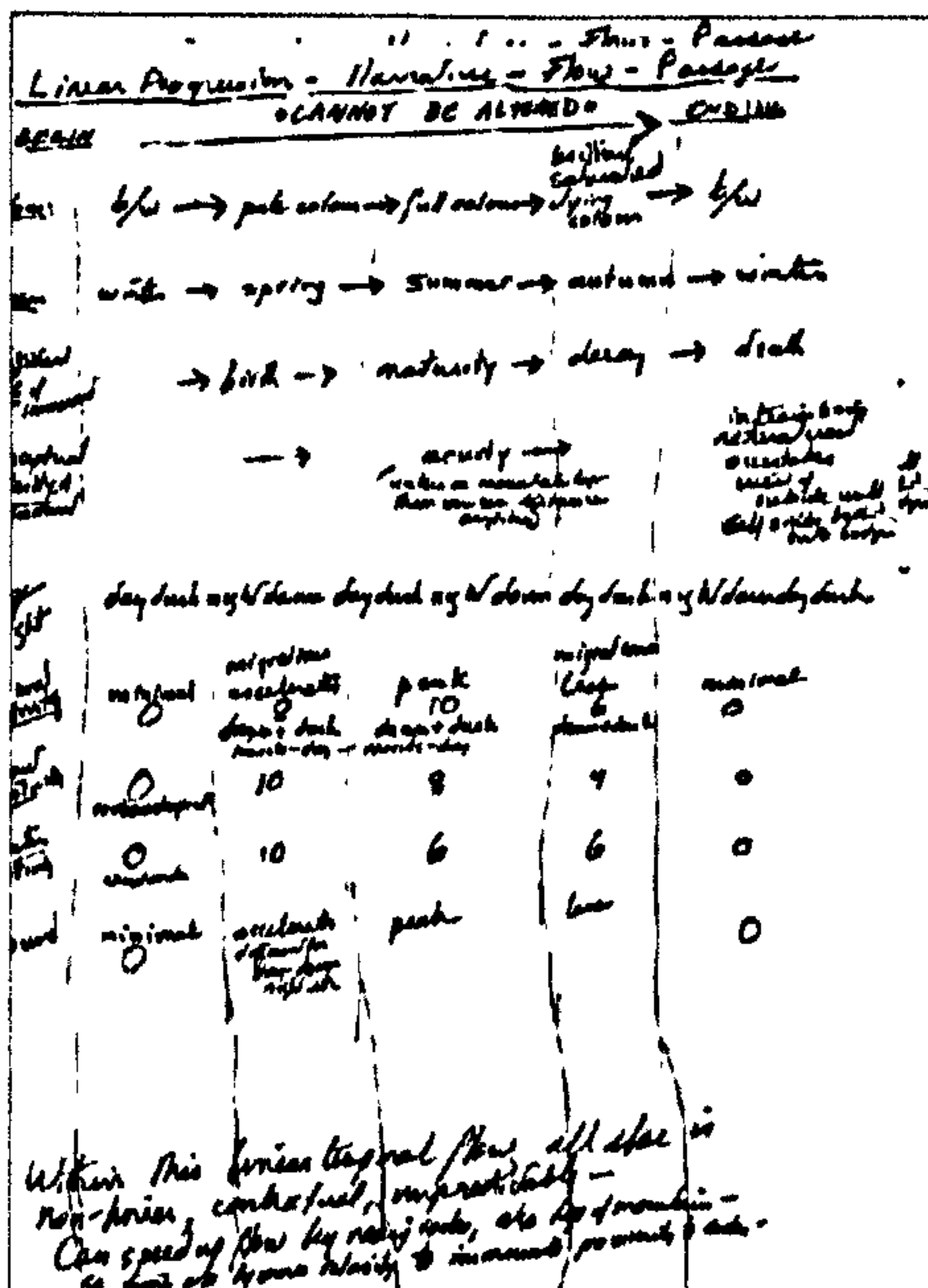
Perceptual relativity: all perception should be affected by location and circumstance; representational quality should change, transparent/opaque, soft/hard, perceptual clarity. Narrative and time linked to the Immersant's journey or passage, an arc of perceptual acuity... [...]

Individual immersive passage: The world is not an architectural space or maze of openings, but web of interrelationships, of contextual possibilities. Therefore no Immersant "passage" will ever be the same, though all will have, as in a human life, certain experiences as begin, maturity, decay and ending.

Through stillness, and heightened receptivity of the Immersant, the world will gradually reveal itself.

FOREST is metaphor for lungs. EARTH is metaphor for blood & flesh. ROCKS are metaphor for bones.

Linear Progression – Narrative – Flow – Passage. Within this linear temporal flow, nonlinear, contextual, unpredictable. It is possible to speed up flow by going inside rocks. So time also becomes relative to the Immersant's proximity to rocks.



Linear Progression - Narrative - Flow - Immersant Passage
 Ephémère Working Notebooks, August, 1996

Ephémère Spatial Realms
 Ephémère Working Notebooks, August, 1996

Aug ?, 1996 Notes from the country:

On the ridge at dusk alone. High up, surrounded by noises from machines, cars speeding below on the highway, and then, one or two incessant birdcalls, knocking of wood, soft flutter of wings. Facing the light, the vertical shapes of trees are dark silhouettes, against pale green translucent foliage: facing into the forest, the trunks and white against dark shadow. And at dusk, a soft grey violet descends over all. As I go deeper into the forest, away from the openings, it gets darker and darker; occasionally there are small green clearings, pools of light. It is much noisier up here on the ridge than lower down where the meadows below are buffered by the trees from the sound of cars.

In the woods, I look for trails, and deer pathways through what appears to be chaos. Rain in the woods. Insect drone. Coming out at the pond, rain in the sunlight, can see it as luminous golden drops. Orchard: trees partially golden green, against darker grey fog cloud, for all of the southern mountains are veiled in dark cloud, but by 7 p.m. deep sunlight striking the treetops here. In shadow they are darker than grey cloud, where sunlight strikes them they are much lighter. This is what is most unusual. The meadows are ringed with forest that one doesn't really go far into, and they change with light.

Pay attention, not to habitat but *process*, i.e., not insects, not meadow, but *pollination*.

August 28, 1996 Lab notes:

Looking at one of our recorded video tests: Of forest with clipping plane and animated texture: distorting space, very ambiguous, vertical. Pool, rocks and green, very intriguing ambiguous soft rocks, transparent. What we've done here is move away from a conventional spatial metaphor to a rippling distorting space that "comes into being" as one is in it, and passes away. One cannot see far, because of plane clipping.

Only the ephemeral present.

September 1, 1996 Notes while reading:

David Abram, *The Spell of the Sensuous: Perception and Language in a More-Than-Human World*: The world is not "inert", but a "living field, an open and dynamic landscape subject to its own moods and metamorphoses".¹⁷ According to Abram, Husserl's *lebenswelt* or "life-world" of living experience is not a private but a *collective* dimension or "common field" in which our lives and those of others are "entwined" – it is profoundly subjective, "ambiguous and in-determinant", because our experience of it is relative: "The life-world is thus the world as we organically experience it in its enigmatic multiplicity and open-endedness, prior to conceptually freezing it into a static space of 'facts' – prior, indeed, to conceptualizing it in any complete fashion".¹⁸ Regarding *Ephémère*, could changes in speed and proximity trigger shifts to and from different levels of experience? The irony is that technology and scientific culture are threatening to over-ride our experience of the life-world, threatening to "obliterate the world-of-life entirely".

From reading Abram on Husserl: beneath the myriad of life-worlds of individuals, cultures and even species, there is a "deeper more unitary life-world", a "vast and continually overlooked dimension of experience"¹⁹ that sustains all our diverse worldviews. I must establish this first in *Ephémère*: not as a

¹⁷ David Abram, *The Spell of the Sensuous: Perception and Language in a More-Than-Human World*, 32.

¹⁸ *Ibid.*, 40.

¹⁹ *Ibid.*, 41.

stage set of worlds/scenes as in *Osmose*, but as a combination of processes, such as daylight, seasons, growth, decay etc., all temporarily based.

According to Abram, for Husserl the earth is the "secret depth of the life-world": it is, to use Husserl's words, the encompassing "ark of the world", the common "root basis" for all relative life-worlds, and accordingly, the task of phenomenology lies in the demonstration of how every theoretical/scientific practice "grows out of and remains supported by the forgotten ground of our directly felt and lived experience, and has value and meaning only in reference to this primordial and open realm": Abram also writes that Husserl recognizes the Earth as the "forgotten basis of all our awareness".²⁰ Most importantly, Abram goes on to say, however, that only by acknowledging the "the embodied nature of the experiencing self" was Husserl able to avoid the danger of solipsism: "It is as visible, animate bodies that other selves or subjects make themselves evident in my subjective experience, and it is only as a body that I am visible and sensible to others".²¹

Abram writes that even though for Husserl, the body is considered the "very locus of the experiencing subject, or self, in the phenomenal world - in the manifest of appearances", Husserl still *affirmed* the self as a transcendental ego, "ultimately separate from the phenomenon (including the body) that it posits and ponders".²² Most importantly, Abram argues that it is this *disembodied* transcendental ego that Merleau-Ponty rejects. According to Abram, for Merleau-Ponty "the body itself is the true subject of experience". (i.e., the subject, the experiencing "self" equals the bodily organism.): accordingly, the everyday common notion of the experiencing self or mind as "an immaterial phantom" independent of the body is an illusion. The "*breathing body*" [italics mine], the "living, attentive body" is what Merleau-Ponty calls the "body subject"; and as we actually experience and live it, the body is a "creative, shape-shifting entity".²³

Abram also writes, "Ultimately, to acknowledge the life of the body and to affirm our solidarity with this physical form, is to acknowledge our existence as one of the earth's animals, and so to remember is to rejuvenate the organic basis of our thoughts and intelligence".²⁴

In this context, my work is an attempt to re-emphasize the subjectively *lived* body in our experience, as an alternative to the disconnection evidenced in contemporary thought, which increases our distance from the living world. The fact that this is accomplished via machines/computers in my work is not the most important aspect: it is the *unusual experience of spatiality accessed* which is relevant. My attempt is an act *against* alienation and dislocation. If my work can create a context in which a person could be in the midst of a "wild-flowering proliferation of entities and elements",²⁵ in which one could feel thoroughly *immersed*, and could be in the *midst* of all this rather than *on top* of it – such an approach might provide an alternative, a way out, of the obliviousness to the nonhuman world. Rather than use technology to distract and seduce people away from the nonhuman world further, I would rather use the medium to *sensitize*. *Osmose* was one step towards this: establishing the aesthetic and the interface, but it was static and unresponsive. *Ephémère* must go further, situating the human participant within the myriad, the wild flowing, of entities and elements, a fluid reality.

²⁰ Ibid., 43; 44.

²¹ Ibid., 44.

²² Ibid., 45.

²³ Ibid., 47.

²⁴ Ibid.

²⁵ Ibid., 48.

And most relevantly, suggests Abram, when one *quiets* "the incessant chatter of words", one finds oneself in a dance, a "duet" between one's body and the "fluid, *breathing* landscape it inhabits".²⁶ Just as in *Ephémère*, all is embedded in the flow of time. As Abram further explains, "Neither my body nor the sensible exists outside the flux of time", and "each has its own dynamism, its own pulsation": Perception, he writes, is an *attunement*, or synchronization between "my own rhythms and the rhythms of the things themselves..."²⁷ For Merleau-Ponty, our immediate experience of things is an experience of "reciprocal encounter", of tension and communication and "*commingling*"; and within this encounter, each thing is a "dynamic presence, that confronts us and *draws us into relation*". Moreover, to define another being as "an inert or passive object" is to deny its ability to "actively engage us...": such an attitude serves to "block our perceptual *reciprocity* with that being".²⁸

In *Ephémère*, elements should *draw* us into participation, swell, pulse, call us, and *engage* us.

Also very relevant, Abram suggests that when we reacquaint ourselves with "our *breathing* bodies" then the "perceived world itself begins to shift and *transform*".²⁹

In *Ephémère*, we need to find more links between visuals and sound, for example a seasonal energy transformation evidenced by changing colour. We could also change the timbre of sound, based on the "breathing body".

September 25, 1996, Lab notes:

Recording our first images from *Ephémère*. 7,500 triangles. Georges is in the helmet, we have 30 minutes worth of recorded tests. This afternoon is the first time I have seen anything in the helmet, on the so-called "infinite-reality" machine. A scene of trees, rocks, a clearing, surrounded by forest-edge like *Osmose*, but with a very different feel: the visible sensibility is pushed much further, very ambiguous, and the rocks seem like clouds at times. In the midst of the working session, John animates some of the textures to create a flow.

And, for the first time for all of us, we see flux. I can't even describe it; it is so evocative, *ephemeral*. The moving ground texture becomes flowing water over the rocks, a sense of tree trunks and a low hill, appearing and disappearing, the rocks, happy accidents. This scene is like a melting pot, all the elements we need are there: *It's like everything is made out of the same stuff, and just reconfigures to manifest into different forms.*

Sept 26, 1996, Lab Notes:

Perceptual relativity: depending on Immersant's location, speed, time of day and season, previous history, and frame, the scene can shift and metamorphosize, so nothing remains the same. The idea of perceptual relativity plays upon the paradox of "doubled point-of-view", combining two-dimensional space (pictorial space) and three-dimensional space (enveloping embodied space). The two-dimensional space involves composition and framing to create meaning, a Gestalt of elements forming a whole, dependent upon point-of-view, of *gaze*.

This approach, this way of dealing with constructing meaning in the virtual space, is grounded in my background as a painter. The virtual 3-D space gives envelopment and temporality, all of which we

²⁶ *Ibid.*, 53.

²⁷ *Ibid.*, 54.

²⁸ *Ibid.*, 56. Emphasis mine.

²⁹ *Ibid.*, 63. Emphasis mine.

experience through our carnate bodies. This is the paradox: Whereas painters translate 3-D space into 2D space, we are translating 3-D space into 2D and back to 3-D, using the principles of 2D image composition (in terms of painterly figuration) to create meaningful gestalts in enveloping 3-D space.

Gaze: as a means of *evoking* response, could create transformation all around the immersant. This approach supports the "perceptual relativity" and "inter-responsivity" that I have wanted for this work. Regarding "inter-responsivity", using the Immersant's gaze – as focused attention – to reveal another dimension/level of activity in the environment, *opening*. So looking at the ground might cause it to open, revealing another dimension of life processes in that place. Not so much "gaze" as *focused attention*.

[The reader should note that my emphasis here is on "gaze" as quietly focused attention, with the goal of evoking response, in terms of "opening" or "revealing" other spatio-temporal realms. Such notion of gaze was intended to be very different from Lefebvre's "eye of God, of the Father, of the Master or Boss"³⁰ (quoted in Chapter I) based on mastery and domination. Eventually, as our work on *Ephémère* progresses, this idea finds manifestation in the elements of the Rocks/Boulders and Seeds, which are always watching out for the immersant, and when approached and gazed upon, will "open" to reveal visual/aural spatial realms within, i.e., Interior Landscapes in the case of the Boulders, and interior blooming in the Seeds.]

September 27, 1996 Notes from the country:

Wind pouring through the land, like a powerful torrent of rivers, flowing up over the meadow, through the orchards. I sit on a boulder on the edge of the woods, sheltered from the light rain, near the pond. The horizon of hills is soft hallucinatory gray. The leaves are starting to turn colour. I walk in the woods and think about *Ephémère* and how to pull all the threads together.

Emphasis is not on the manifested, the material, but rather on the immaterial, on *process* rather than entities. *A living being amidst all this flux*. Represent the flux, the ephemerality, the coming into being and the passing away: try to enable others to have a glimpse, a fleeting sense of this. Why do I want to communicate this? *No longer making an image, a painting, or a representation of an experience, but rather remaking the very experience itself, synthesized, amplified and distilled.*

October 7, 1996 Lab notes:

We have a new scene. Everything is in the *same* place, not in adjacent world spaces. Moving/location are less important, instead we have gaze, timing, and transformation. The river has good flow, ambient lighting is corrected. The fog now obscures things. Overall fog is lighter. The scene does not allow us to go inside a rock, nor have scalable texture. This scene is more technical but too literal.

³⁰ Henri Lefebvre, *The Production of Space*, 408.

October 7, 1996 Notes from the country:

Summary of notes made from reading David Abram, *The Spell of the Sensuous*. There is a deeper unitary life world, of cycling day and night, and seasons etc. Beyond this is a myriad of life-worlds, a "wild-flowering proliferation of entities and elements" in which we are immersed. Each of these, dynamic presences, *draw us*. Interrelation: nothing is inert or passive, everything can engage the participant. Elements pulse, *call us*. We are embedded in this flowing animate world, which because of our usual oblivion to it is being snuffed out. This incarnate sensorial dimension, not as mapped from without but *as lived from within*. Speaking bodies are "*generative sites*", each a vortex where a matrix is being spun out, a world that speaks.³¹

As I make these notes, I gaze out the cabin window into a landscape of blazing saturated yellows, golds and oranges, a climax of colour, the peak of autumn leaves in brilliant hues. A strong wind, blowing leaves everywhere. By next week, the trees will be half bare, and the land will already begin feeling like barren November. It is 6 pm or so, and the last sunrays of the day are striking the birch by the waterfall: I feel a state of perceptual, existential vertigo, with the land around engaged in an operatic, feverish pitch of colour. All of this, I hope will influence *Ephémère*: I forget how extraordinary a Canadian autumn can be, here I am immersed among its flux, and wind and shifting light, enveloped in sight and sound and smell, so full and grounding.

October 28, 1996 Notes from the country:

Dusk is falling around me; I am *in* this land, embedded in its rhythms, grounded always by its extraordinary complexities, its flow. I wait in tall dry grasses for the deer to come out, in violet light.

Sound: fleshy, organic-sourced sounds in the middle of the virtual space, then becoming more and more machinelike and abstract on its edges.

Think about having the Immersant's choices affect the work. Not only where they look, but *how* and where they go. That it is their bodily position that shapes the work. In *Osmose*, they were only navigating. In this work, the Immersant's position should cause *openings* in the landscape: *the responsivity should be everywhere*.

October 29, 1996 Lab notes:

Looking at our various tests: The idea we are trying to explore is to have *elements come in into being and then pass away*. According to the distance Georges (in the HMD) is from the virtual tree, the mountain's appearing is initiated. The scene is rendering very, very slow. 5000 triangles in *Ephémère* are like 50,000 in *Osmose*, because they are being loaded as "transformations". John has more than a month of programming to see if he can solve this. If we want flow rather than static models, he has to solve this problem.

November 1, 1996 Lab notes:

John is going to work on optimizing the frame rate, and connecting the breath. Want to *counteract* the belief that we are not part of the world or that we are above it. Colour of light, magic hour, when everything glows, lights up copper and crimson and gold for a fleeting instant, as if the world had caught fire, crescendos of intensity were everything speaks more audibly, blazingly, before fading and *dying out*.

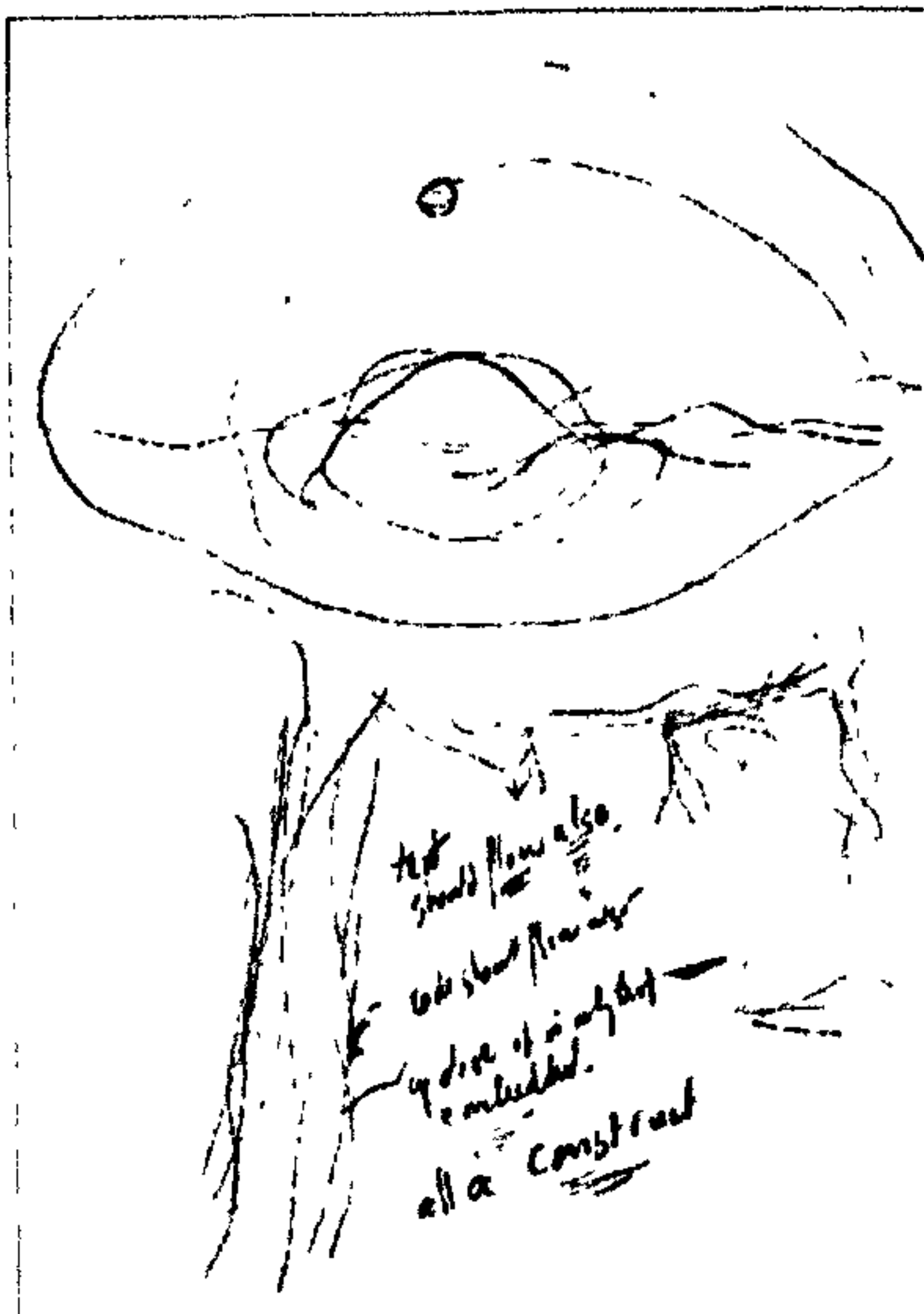
³¹ Abram, 84.

December 3, 1996 Lab notes:

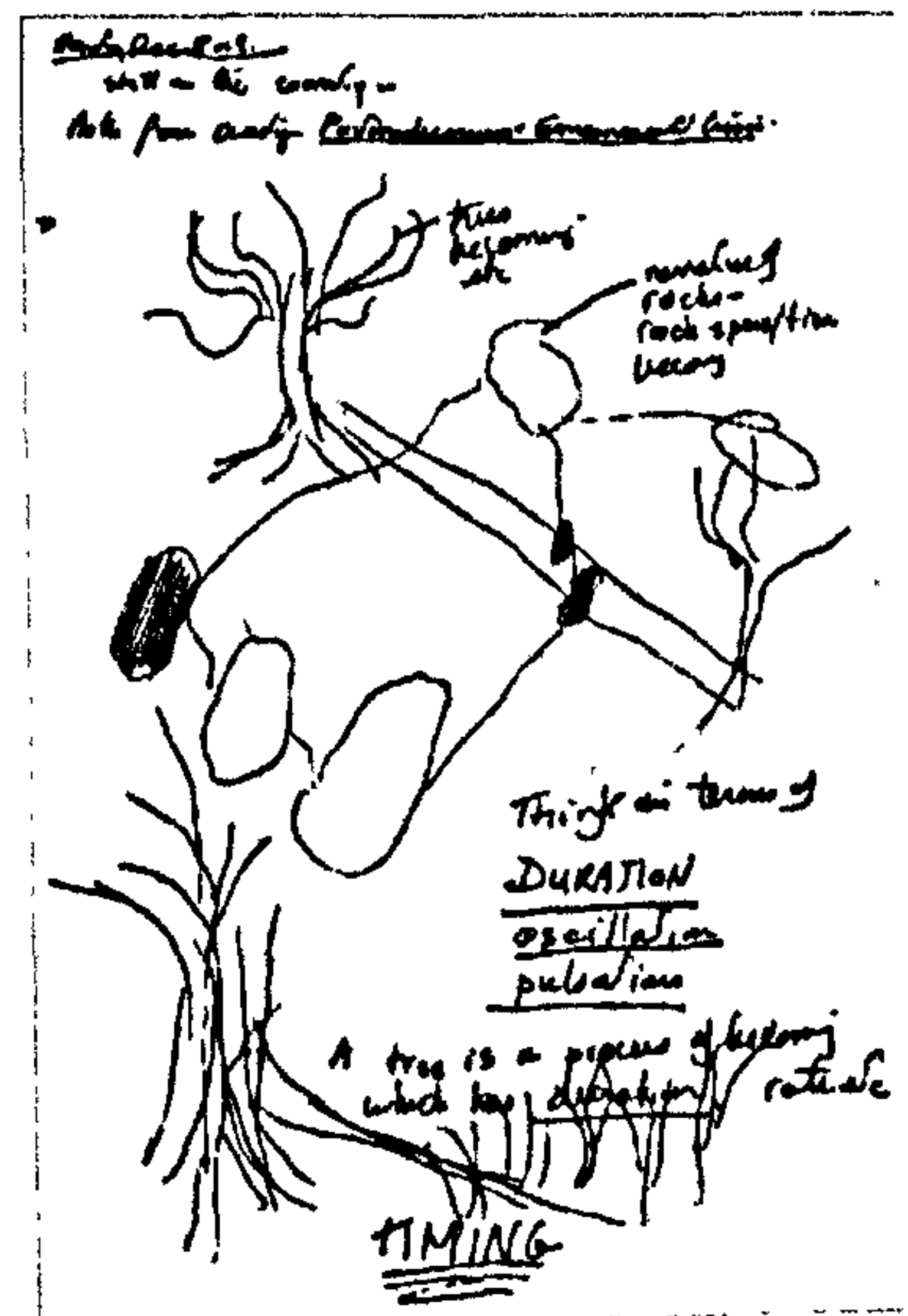
John has been optimizing: frame rate is now excellent. A scene of mountains and flecks. Everything flows, textures moving over surfaces: *every single vortex is being altered in real-time*. Pulsation of light, flow, fade. Direction of flow. Processes take place in time and space. I realize from looking at this simple test of flecks and streaks of air, with everything flowing, how key to this project is flow (process), and perceptual relativity. Temporality becomes its foremost characteristic. *This becomes our language: Transparency from Osmose + flow = Ephémère.*



Temporal Passage
Ephémère Working Notebooks, Dec 7, 1996



Landscape (as Ovoid-Sphere) with Bones
Ephémère Working Notebooks, Dec 7, 1996



Duration, Oscillation, Pulsation
Ephémère Working Notebooks, Dec 8th/9th

December 8 – 9, 1996 Notes after reading:

Arran Gare, *Postmodernism and the Environmental Crisis*: Each time one enters something in *Ephémère*, the "world" around could be changed. But how does one enter something, if things are parting as one moves through? (Certain elements maybe don't part, do not sway away) If one slows down in *Ephémère*, the appearance of processes/flow might become more delicate, discernible, slower, so that one can catch one's balance. If one speeds up, the flow speeds up until it is a blur? Or becomes solid? Or do things disappear? Or go into an undifferentiated blur? We should determine that different actions, different attitudes, will create different experiences (so perceptual relativity *does* take place, linked to the culminative effect of past actions): depending on the immersant's behaviour; the "world" will appear/behave in a certain way. *Do not think in terms of "things", but of processes, oscillations, occupying different space times*, i.e. all trees in *Ephémère* could be in one space-time, and all rocks in another. There is no ground, only self-creating beings, accidental embodiments, a multiplicity of different kinds of becomings. *Beings are temporary islands of stability within the flux of becoming*, change is constant, stasis is temporary, stasis is change momentarily arrested, there are thousands of different temporal/spatial orders of becoming,

Gare writes of "conceiving the world as a process of creative becoming, consisting of a multiplicity of different types of processes in various complex relations, each making its own unique contribution to the becoming of the world..."; and, "Once the world is conceived of as a creative process of becoming, the notion that the meaning of anything is given by the end which it helps to realize – the notion which as Nietzsche appointed out is the ultimate source of the nihilism of European civilization – can be

abandoned."³² He also goes on to say (most relevantly to *Ephémère*): "Each individual process or sub-process within the universe is like a melody singing itself within a symphony".³³ And he emphasizes, "...what is required is a multidimensional narrative at least acknowledging thousands of different temporal and spatial orders, both within the becoming of humanity and within the rest of nature".³⁴

Think in terms of duration, oscillations, and pulsations.

In *Ephémère*, a tree is a process of *becoming* which has duration, a rate etc. Think about timing. Trees are all on a particular "web" of tree-space-time, and their flow is synchronized to certain other events, i.e., a certain level of attention from the immersant is necessary to experience them as more than a regular sight of a tree.

Rocks are also in their own space-time, i.e., the geological. Rocks are on a geological time-space scale, and so they flow more slowly relative to us, and seem stable and unaffected. But if one goes inside, one can then see the landscape flow more quickly. This could be a way of manifesting the relativity of perception of different beings/worlds. If immersant goes inside a rock, everything outside it goes very fast in comparison. If one goes down, one enters into different space-time, for there is no ground. We need different rates of flow.

We need to offset the reliance on vision, doing so by lots of fog, so visual acuity is offset by blurriness, inability to identify, as well as sounds and use of body core to float. Remembrance of breath and balance retracts some of the reliance on sight. There's nothing behind the appearances but more process and flux. Think not of "things" but in terms of durations and potentialities. As each "thing" comes into being or disappears, it affects all others. There is not one ground, but many grounds, each a self-generating vortex – in a particular time scale, interweaving, affecting, being affected by all the others – a ballet. Forget categories of inert matter, space, time, motion (from a mechanical view of the world).

According to Gare, process is an *ordering* activity, constraining as in music: what most people identify as things or objects, he thinks of as "structures" which, as "ordered potentialities" can be understood only in terms of being "maintained and produced by processes".³⁵

By using categories related to process, Gare suggests that it is possible to reject the "conception of space and time as the self-subsistent, continuous receptacles of all other entities in the universe and to define space-time in relational terms", i.e. by conceiving space-time as "emerging or becoming through the constraining of causal interactions within the world".³⁶ This can be difficult to comprehend in terms of visual analogies he writes, but does become possible when conceiving the world in terms of the auditory, because in music "becoming" is central (rather than space being "an order of places external to each other"³⁷ as it was in *Osmose*), whereby there is an order from which "extended places emerge from a dynamic, flowing continuum as sub-processes differentiate themselves..."

Gare goes on to explain that conceiving of space-time in this way "opens the possibility of there evolving a number of space-time orders"; he gives some examples of what different space-time orders could be: e.g. geological processes in geological space-time; life processes in ecological space-time; organic processes in life space-time; and perception or action in subjective or lived space-time, and social

³² Arran Gare, *Postmodernism and the Environmental Crisis*, 142.

³³ *Ibid.*

³⁴ *Ibid.*, 143.

³⁵ *Ibid.*, 121.

³⁶ *Ibid.*, 123.

³⁷ *Ibid.*

life in terms of a complex of interpersonal space-times.³⁸ Lastly, he quotes Jacob Von Uexkull (1926) notion of the life-world or *umwelt*: "...there are as many surrounding worlds as animals", a vast variety of life worlds, each a melody singing itself...³⁹

Dec 9, 1996

Reading Gare affirms that I need to list various linked processes of *becoming* in time/space: i.e. rocks in geologic; trees in organic (link them to Interior Body *lungs*); overall eco-systemic; various space-times that might affect each other like melodies in motion; and also the effects of the Immersant, i.e. not only past behaviour but if one moves slowly everything becomes more rich and varied. Causing "things" to come into being, endure, or fade away, speed up, slow down etc.; different time scales, space scales, how/where to access; ways to offset reliance on vision.

Notebook # 2 December 1996 – Sept 1997

Dec 9, 1996 Lab notes:

Flow: we look at a video test of a combination of flecks and luminous lines, a good effect for flow. The flow is excellent but there is no directional light. The rocks are made of tiny flecks but do not move: need to find a way to create flecks moving out to the surface. When one becomes still, one sees more and more details of flow: when one moves fast, it is as if everything is static because one is no longer paying attention. Create different cycles of flows. Set different levels of flows in motion. Do not build scenes, but rather: a) *a vocabulary of flows*, i.e. not only through light and colour as above, but directional, pulsation, luminosity, texture animations of flecks & streaks; b) *a vocabulary of temporary "structures"*, e.g., tree shapes, rocks, pebbles, mountain, streams, rivers, etc.

Elements, that recombine, reconfigure, or "re-constellate" depending on context, with each having their own scales of space-time: such as tree, water, rock/stone/boulder, air/fog, fire (the window/doorway represents the hearth and fire consuming). This emphasis on flow, of re-constellating elements, in cycles, of flow, enmeshed cycles includes: day night, spring summer autumn winter, fog thick and thin, direction of lighting and shadow, blooming fruiting decaying...

Perhaps this, what I am after (in the context of Gare's writing), is another kind of attempt to see (*to "picture"*) the world, not only as process, but as different space-times of process, whereby each kind of space (tree space etc.) has a different kind of time, and their rates and directions of flow, of coming into being (becoming) and passing away, are enmeshed together.

For example, we should set the day night cycle spinning, with its lighting level, direction, colour etc.; set the annual season spinning (with various triggered effects); set the trees cycle spinning; set the rock cycle spinning (very slow); set the moon/tide cycle spinning; set the generations of butterflies etc.; also set the cycles of text spinning - and then let them go ... see how they affect each other ... that is the evolution of life. (What this omits is the cycles of events triggered by humans.)

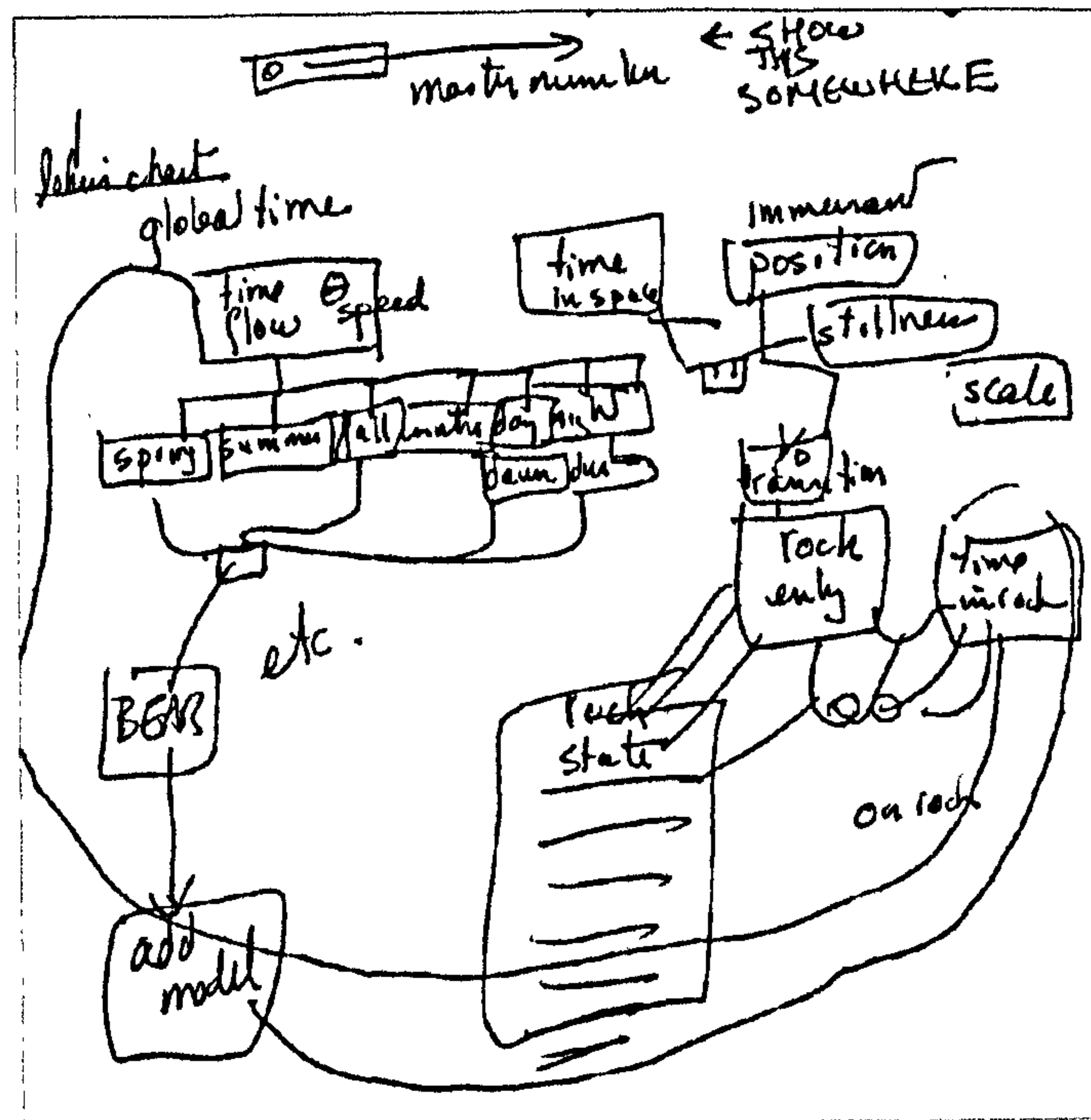
And then, *through it all, the single trajectory of a subjective human lifespan, being born into, and dying out..*

³⁸ Ibid., 124.

³⁹ Ibid., 130.

December 10, 1996 Lab notes:

We consider introducing a master ("god") number that goes from the beginning of the work to infinity. Transition of availability —"openness" —receptivity. John makes a chart which I interpret as follows:



Global Time Structure
Ephémère Working Notebooks, Dec, 1996

December 16, 1996 Lab notes:

We can change place really by simply shifting context. I realize this way of working is very painterly, on site, real-time, responding to the work, and doing push-pull: i.e. ramping up the colour and then pulling back, increasing flow to really fast and then slowing down a little. We will need to work the different rates of flow in relation to each other, more as if each one is an instrument, or a flow of voice, and we need to work the temporality of each in relation to the others: it is all very relative.

December 20, 1996 Lab notes:

We need to have John's prototype of the open programming system up by the end of January (1997), have it running by February. Not to be a closed system but completely open which makes it very ambitious, so that the permutations can be almost unlimited i.e. so we can have many transitions, many permutations.

Fog: We need more layers of fog, with entities separated by fog; so that when the Immersant comes near an entity, it is full of life flow, but the next one is a long way away, separated in fog.

Sound: if we have fog and voice, we need to have an echo: this would recall the sense of being alone and calling oneself i.e. sending a message in space and hearing it back told by oneself using the environment. The land is talking, like it is oneself. Use a delay.

As for the River with rocks, it could be a path to follow, very directional, good flow. we could use the river to travel from one place to another. We loaded 120 textures today.

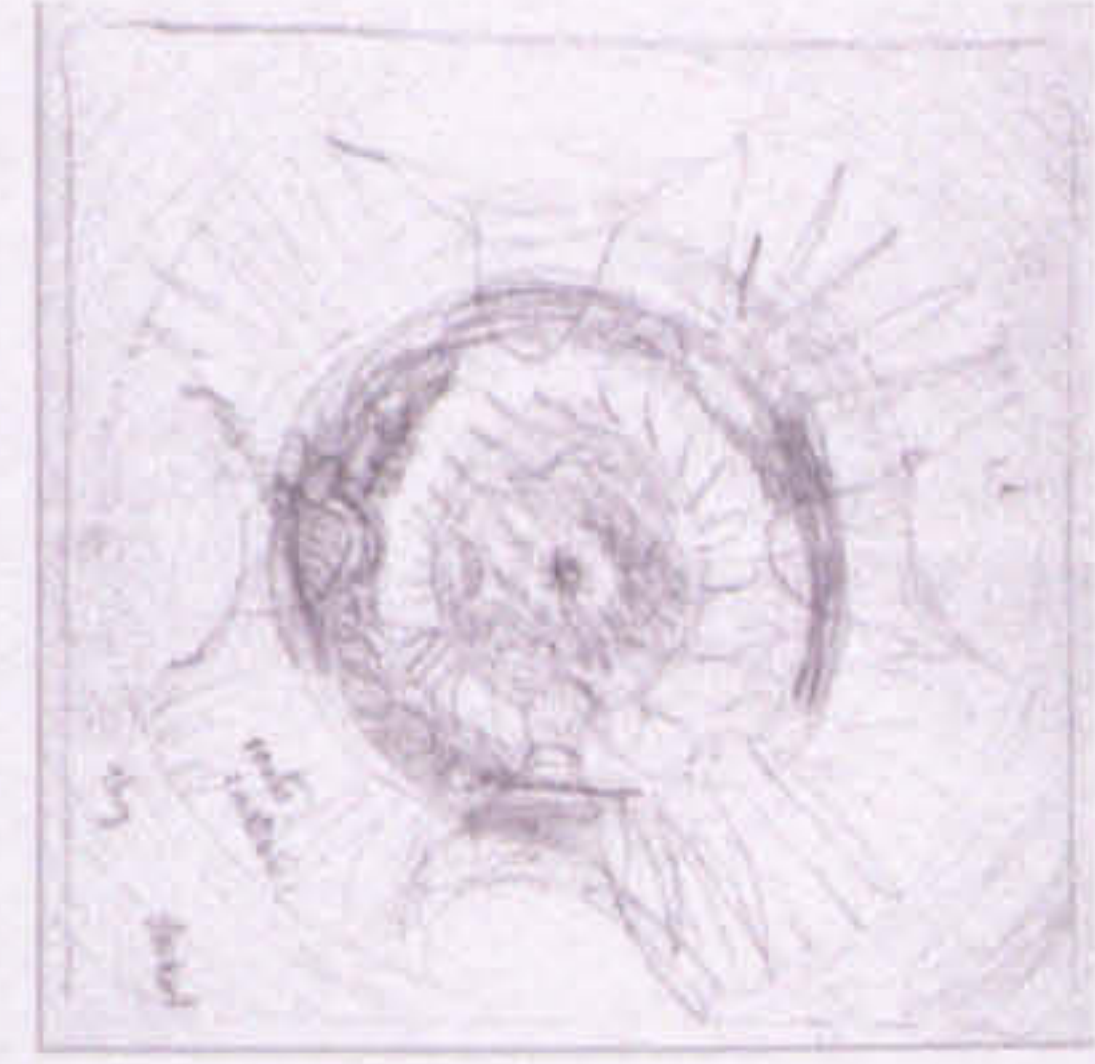
[This was the first mention of using the river element to travel, a concept I had first developed in the *Osmose* white paper (see previous chapter) but which we had not had time to manifest in that work. It was therefore left aside, and resurfaced here in *Ephémère*. The concept of river/stream is another recurring element in my work, first appearing in 1972-73, in a painting about a river/stream as seen from below, *within* the earth, looking upwards through the transparent surface of the stream. Such a view, i.e., from underneath, looking *up* through soil, roots and rocks, through transparent water to sky above was also the theme of a painting made soon after. See reproductions below.]



Stream & Under-Earth Seen From Underneath 1972-73
Conceptual drawing, & oil painting on canvas



Earth, Rocks, Roots, from Underneath 1976
Oil painting & conceptual sketch



January ?, 1997

Stream/River: river as metaphor. River as flow. River is a way of traveling to the space. River *is* flow. River as river, torrent, trickle etc. River as tree, branch, leaf, bloom. *River as vein, artery in body.* When one pulls away from the river, one could realize the context of where one is, so one could get outside of things. If one goes very fast, the context could change and the world could become symbolic. One cannot however get outside of the body. (Remember my diving experience of the underwater river flowing 100 feet below the surface out of a blue hole in the Bahamas.) Heraclitus' river. River as lifeblood. Change is constant.

We decide to generate this landscape as we go, as in the *Osmose* forest, as a way of avoiding the branching cliché (and tunnel cliché) which is following a river with branches to get everywhere. Technically, the alternative to branching is to generate chunks, rather than branching. *The challenge is how to find stillness in flow.*

February 10, 1997 [e-mail to Rick and Dorota on sound.]

[This e-mail was written to keep Dorota Blaszcak and Rick Bidlack (who had worked with us on *Osmose*, as sound engineer/sonic architect, and composer) up-to-date on my evolving conceptualization of the sound for *Ephémère*. We were not yet actually working on the sound for *Ephémère* at this point, and only began to do so seven months later, in Sept. 1997. Ideally on such a project, research and development of the visuals and the sound would proceed together. Unfortunately, due to budget limitations this was not possible.

Sound: Here are some informal thoughts on sound... I want this new work to be emotional, *mournful*. I hope people will respond to a beauty in this work that is fragile and fleeting, a mirror of their own mortality.... of how briefly things come into being in the world then pass away, including each of us... to

represent the flowing flux that is the very stuff of Life (and death...) which usually we are too distracted in our edifices of human activity to see or hear...

In comparison to the sounds in *Osmose*, I want to have less "abstraction" here in the sound, rooting it, *grounding* it in the fleeting 'fleshiness' of the world... For this I suggest you record, or access through others' recordings, "real" sounds, a whole host of voices of the world (not only human) sounds that once sampled, can be reworked to become other sounds so they cannot be identified as to where they originate from – but even so the fleshy/material/physical/real quality would somehow remain and we could sense its presence, know the presence of the *visceral* world in this virtual work – that this is the world "worlding" itself in sound... and then "worlding" itself in our work, *through* us.

As in *Osmose*, where I did *not* want the sounds to be recognizable as being notes from musical instruments, or as recorded natural sound effects, equally in *Ephémère* I do not want them to be either of the above, nor do I want them to be recognizable as digital. I want us to try to go beyond *Osmose*, into some blending flux of the most fleshy organic visceral and the most delicately electronic, as if there is no difference between the two... This new work should not feel "urban": the human-made, machine-made sounds are only an aspect amongst the rest and would only exist peripherally (as if impinging upon, crowding out, sometimes dominating the other sounds), just as in the countryside you can hear the sound of cars and planes and beyond the range of our human hearing there are the airwaves of radio and television and all that incessant chattering... wherever you are. Combine this with the fleshy sounds: of a pumping heart; of hummingbird wings; of the slow eonic groan of rocks as they rip and age at a rate slower than our comprehension; of rushing blood not only flowing water; of things being born and things dying in and out of being.

This is a cacophony of the world incarnate, "presencing" between the thresholds of birth and death, yet for each thing, each element, these thresholds are situated at different points in time – and space – (as they are for each of us) so there is a constant flux, of syncopated (if that is the right word) varied but enmeshed rhythms, of comings into being and of passings away, all of this manifesting as a myriad of aural streams in flux and flow. This notion of flow is very different from what we attempted in *Osmose*, and conceptually it is the key to the entire new work.

Graphically, we are trying to create streams or flows of "stuff", such as rocks coming into subtle (semi-transparent) visibility and then subsiding; things coming into manifestation momentarily, temporarily as recognizable elements in the midst of flow, flux and transformation – with entire rhythms generating other rhythms, such as the moon rising, triggering a flooding of water then subsiding etc. The idea of this constant, interconnected flux of cycles is key: it is an attempt to re-present "being" (i.e., the stuff of the world) as process and becoming, as temporal and relative, as *flux*. (On a more intellectual note, this actually ties into various theories of process-based philosophy and diverse but inter-related flows of energy through ecosystems.) Like its predecessor, *Ephémère* is based on landscape – as all my work is it seems – with an emphasis on rivers and rocks, arteries and organs, (though no central tree here, and no central clearing) with rivers temporarily-forming islands in the flux...

We need to be able change the quality or timbre of sounds at times to be exterior or interior, with echoing, and also perhaps have the presence of an huge encompassing heartbeat that is also heard at the bottom, at the base, so sometimes it is in our awareness but many times it is not, and maybe the sound of breathing (a very powerful aural sensation when one is diving) The heartbeat sound could be linked to the speed of the immersant through the work, and a myriad of other heartbeats of the other entities in the world, all different pulsations of life flowing...

And just as the visuals are being designed as a myriad of levels of subtle semi-transparent flows each fluxing into and out of being, all flowing directionally as well at various pulse rates and luminosity, and elements which will change their meaning according to the context... so too the sounds should flow in streams at various rates and rhythms and densities, sometimes separating out and sometimes blending together (like woven strands or gathering flocks) and slowing and deepening, some fading, others coming in, much of the time depending on whatever visuals are doing the same etc.... The sound and visuals have to be linked...

And most importantly, as the rhythmic flows and streams of visuals affect each other (and are affected by the global cycles of night and day, seasons and so on) and are also affected by the behaviour of the participant... so the various streams and flows of sound should have the potential to be momentarily arrested, diverted, altered by the various cycles, elements and participant behaviour, and perhaps the streams of sound will affect the visuals too.

Interaction is key to this work – In comparison to what we hope to achieve here with the interaction, we had little interaction in *Osmose* at all. This is the technical challenge John is focused on now, how to structure the possibilities....

February 18-20, 1997 Lab notes:

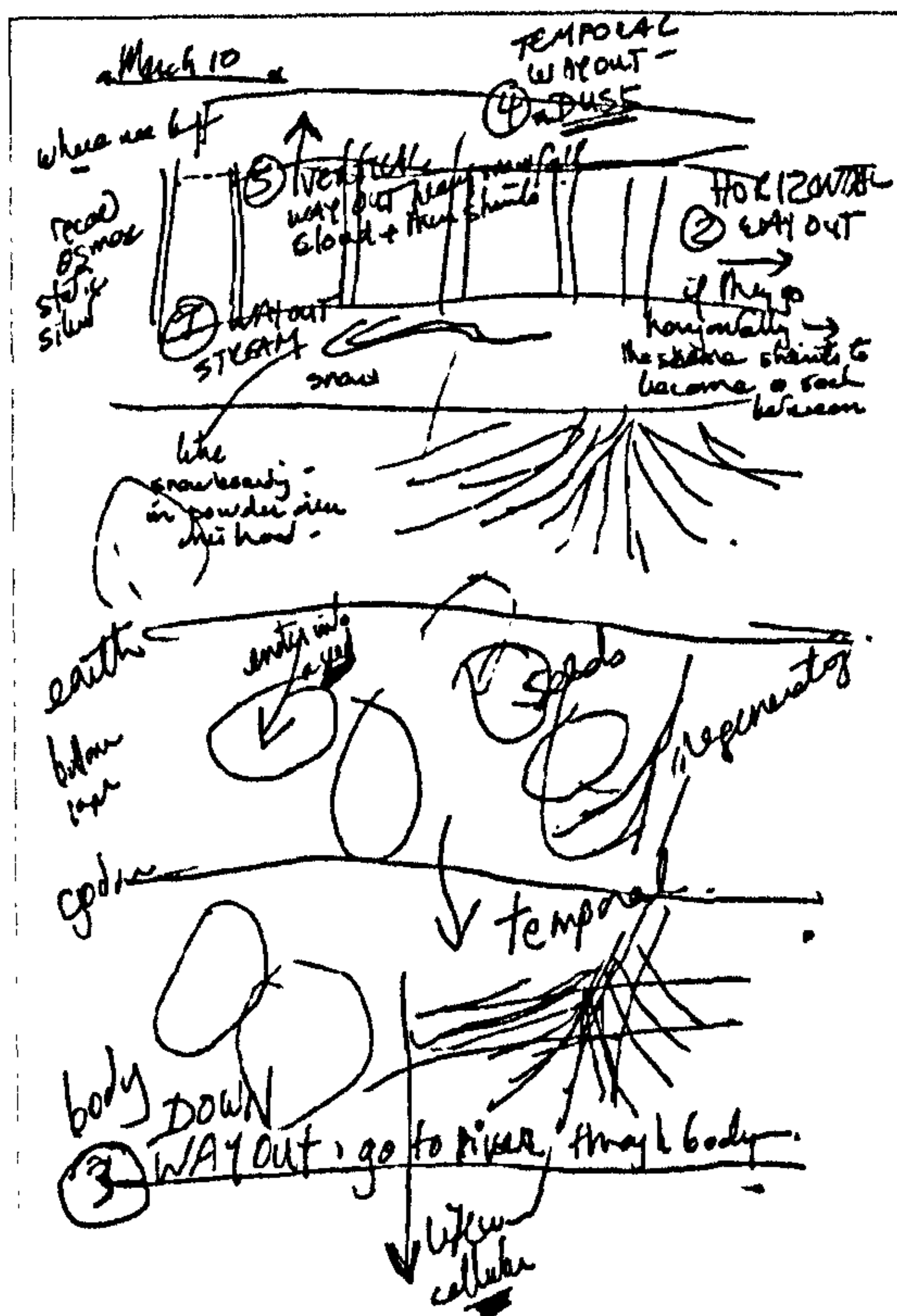
John is almost done with the programming necessary for the interaction. We need to put a few elements together and see how they interact with the flux and flow, and go from there. The process becomes about *not* controlling: This work is very much about *not* being able to control.

We talk about how I want people to feel that fragility and fleetingness, of mortality, of things coming into being and dying out. There is a progression; there is indeed a narrative, with the beginning in fog and winter swamp and the ending in the blazing colour of autumn. I look at John's tests of flowing rock forms that look like both the interior of a body and blooming plant bulbs, with a beautiful blue.

March 5, 1997 Lab notes:

John and Georges have been analyzing problems with the breathing, doing comparative graphs. I look at the video tests of the Winter Swamp scene. Flecks have been added which are affected by sun (but they do not belong in this scene of stillness). However they could, depending on context, work elsewhere as insects, a field of wheat, fish, tadpoles, pollen in air, eggs in water etc... Roots on the trees look like lines of energy, especially when they are interlaced.

John shows me the flowing rocks again (from February 19th), cold blue and blue green: they drift away (a stalking algorithm) so they move away when approached: they *could* be life-forms. When scaled vertically they become buds and blooms, or could represent looking at the heavens, or *one's own dying*.



Spatial Structure of Landscape, Earth & Body with Immersant Exits
Ephémère Working Notebooks, Mar 10, 1997

March 10, 1997

We now have a spatial structure of three horizontal levels:

- 1) upper horizontal level of Forest Landscape (same level as Winter Swamp);
- 2) middle horizontal level of Under-Earth with roots and regenerating seeds;
- 3) substrate of Interior Body.

Exits or ways out of the various levels include:

- 1) out through the stream from the Forest Landscape;
- 2) *if* horizontally in the Forest Landscape, the scene shifts to become a rock;
- 3) *if* vertically down, through the stream/river, through the Interior Body to the cellular;
- 4) a temporal way out at dusk;
- 5) a vertical way out of the Forest Landscape, through heavy snowfall and cloud;
- 6) enter into a *seed*.

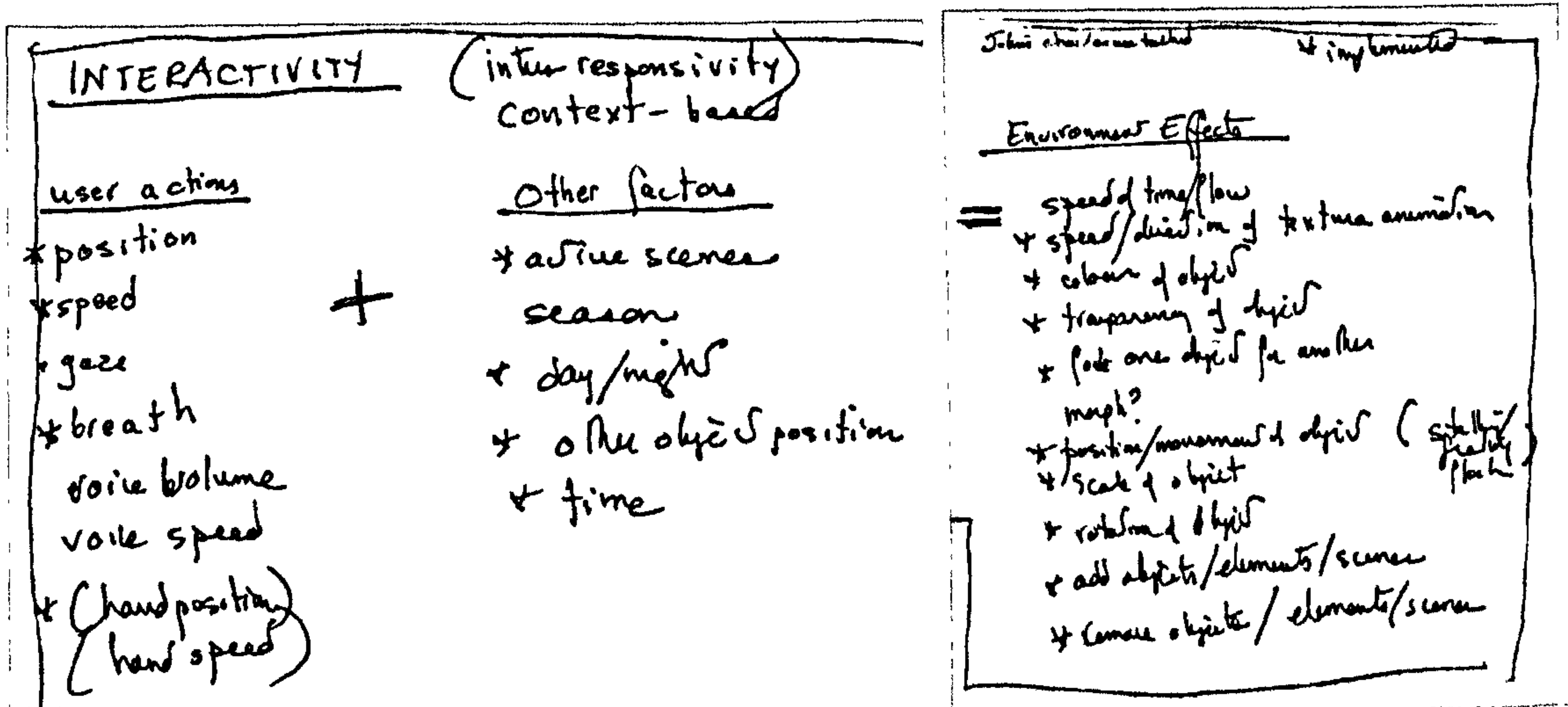
March ?, 1997

Winter Swamp: moving elements include: moving sun; fog moving, thick thin; light changing; stream flowing; snowing – none, light, heavy; moon rising. The Winter Swamp now *feels like a place*: the forest edge is fine; the clearing could be bigger, although the trees disappearing into cloud are fine. Trees turn sideways when one enters. Trees are now lined up as I asked, becoming more abstract so the Immersant begins in a totally abstract place. Rocks/Boulders become "openings": this becomes a metaphor for a window/doorway, also vaginal openings for birth, and for passages into death. Transitions out of swamp, out of body, out of earth.

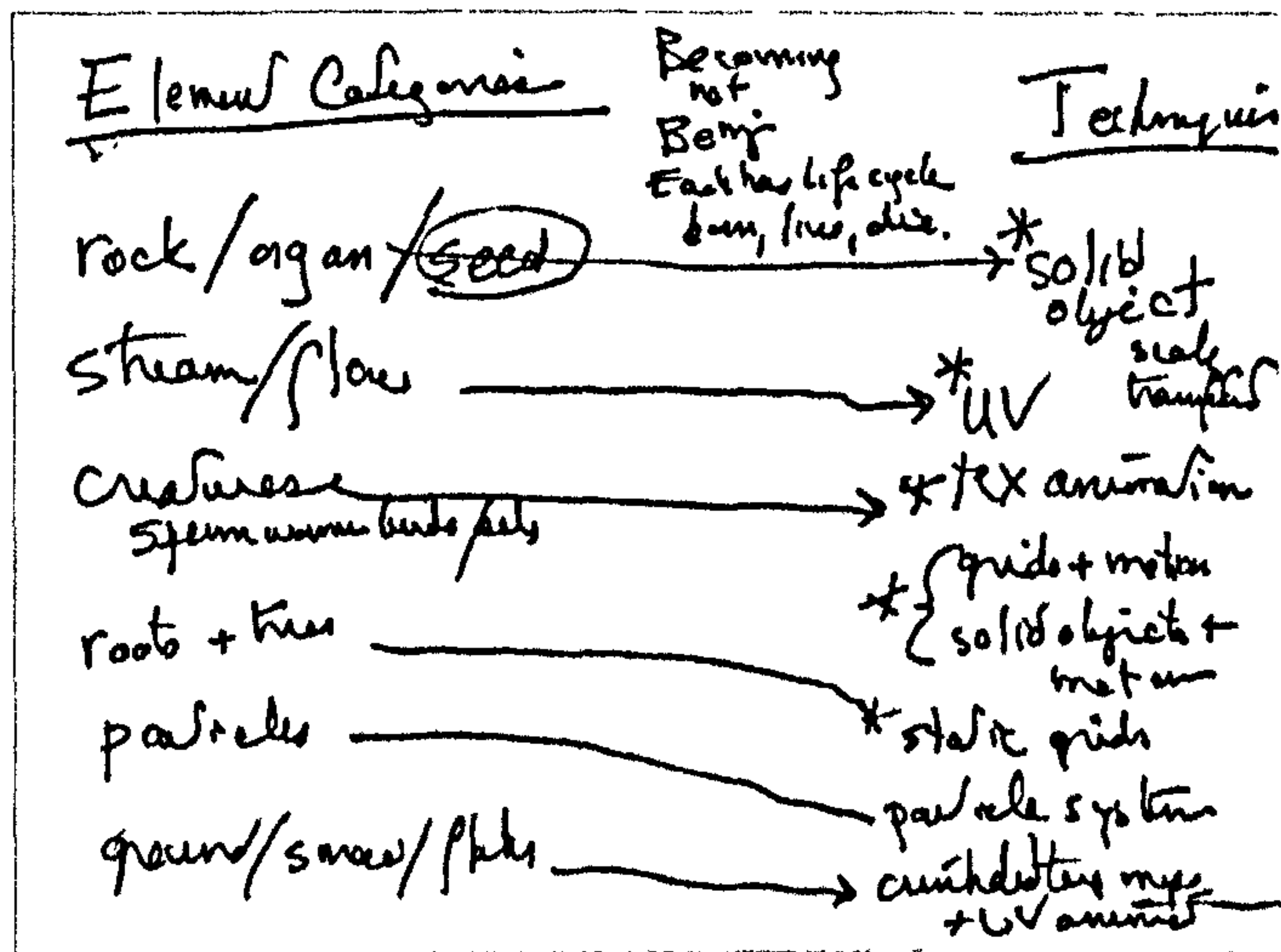
March 19, 1997 Lab notes:

Types of interactivity/effects: position in space (translate, scale, rotate); movement of texture on model (speed and direction in u or v, scale); replacement of texture by replacing one model with another, and fading in, fading out (sequence of textures, animating them but with a very limited cycle); appearing and disappearing; colour, luminosity, transparency of models; colour and density of background/ fog; maybe morphing, but this doesn't work yet, needs more triangles, needs more programming. (Manipulating vertices would have to be programmed, could be very challenging technically: possible but very time-consuming to program.)

Types of interactivity / causes: position (approach, go away, xyz and rotational orientation); speed (overall speed, hover, wait, stillness, going horizontal, going vertical); breathing; gaze (objects become aware, and are watching); volume of voice, pitch of voice.



Context-Based Modes of Interactivity and Environmental Effects [*already implemented]
Ephémère Working Notebooks, March, 1997



Categories of Elements and Corresponding Techniques
Ephémère Working Notebooks, March, 1997

March 20, 1997 Lab notes: watching Georges in the HMD.

Based on my request yesterday that the River move away from the Immersant if approached: John has done simulation of texture animation; second effect uses particles and these ones scatter, also effective, but this means we will have less particles although this is easier to program. Both of these efforts are moving in the right direction to scatter particles. Since yesterday, John and Georges have worked on horizontally exiting from the Winter Swamp. This works quite well, except the rocks should not feel palm-sized but boulder-sized. John will bring dusk back in, and use darkness as another way out.

March 25, 1997, Lab notes:

Winter Swamp: We have found a way to do transparency in a whole new way, so much more effective, more contrast, now we can see the tree trunks under snow. Real fog, due to John's programming. We need to start working with a *time-based script* for the Winter Swamp:

- a) first 30 seconds of white and black lines, and high contrast;
- b) as the immersant begins to move, all becomes fog and one can see that the lines are trees;
- c) over the next 30 seconds, bring in snow, and the encircling forest, and grasses, and boulders;
- d) last 30 seconds, bring in colour, related to the sun position and as the sun sets, colour shifts to black.

Could we have ephemeral shadows in the snow? Could things become solid, i.e. even the snow flecks becoming larger, if one goes too fast? And have an "opening", becoming receptive if one goes slower, allowing one to pass through? We need to develop in a relation between receptivity, responsivity and *resistance*.

Under-Earth: John has redone the entire transparency method increasing our colour depth, (a pixel depth of 20 to 40) and no more banding. Very effective. Now every pixel that is added is getting saturated whereas before it was just being averaged.

Interior Body – as ground. Does it change? Depending on location, time, or speed? And Interior Body ages. And as it ages, it gets jerky, slower and slower, lower amplitude, less luminosity, less colour... Interior Body goes to bone, and ends in its ashes scattered.

Somewhere should we show a "periodic table" of symbolic recurring elements?

March 29, 1997 Notes from the country:

Begin with: white fog, the *plains of forgetting*. Enter into the winter swamp, from above. In the Winter Swamp, always frozen, if one stays longer, gray patches begin showing as if snow melts. Rush of stream. Down, grow down. "Downward from the transcendent to the teeming here of immanence".⁴⁰

Notes written while looking by the beaver pond:

Tree trunks are wet, black. There is no snow when there is fog (snow could happen if the Immersant floats up). Trees are increasingly grayer and fading as trees recede, then become gray as more distant trees on the forest edge. Forest edge is gray not white, it is soft gray, no sharpness except a little darkened texture at the bottom. The edges are mid-tone gray. Sky is halfway gray, i.e. lighter than the edge, darker than the snow or ground. The fog thickens and thins. Sound of gentle rain and creek eventually (should begin with mournful melody of loss). In a swamp the size of this old beaver clearing,

⁴⁰ James Hillman, *The Soul's Code: In Search of Character and Calling*, 44.

there is one tree every 20 feet, almost a foot across, and smaller ones also, and grasses. In this light, all is gray from a distance, with a faint ochre in the grasses. (The close-up rocks that are/were in wet shade have moss and lichen, in several tones of green).

Ephémère's Winter Swamp has too many trees.

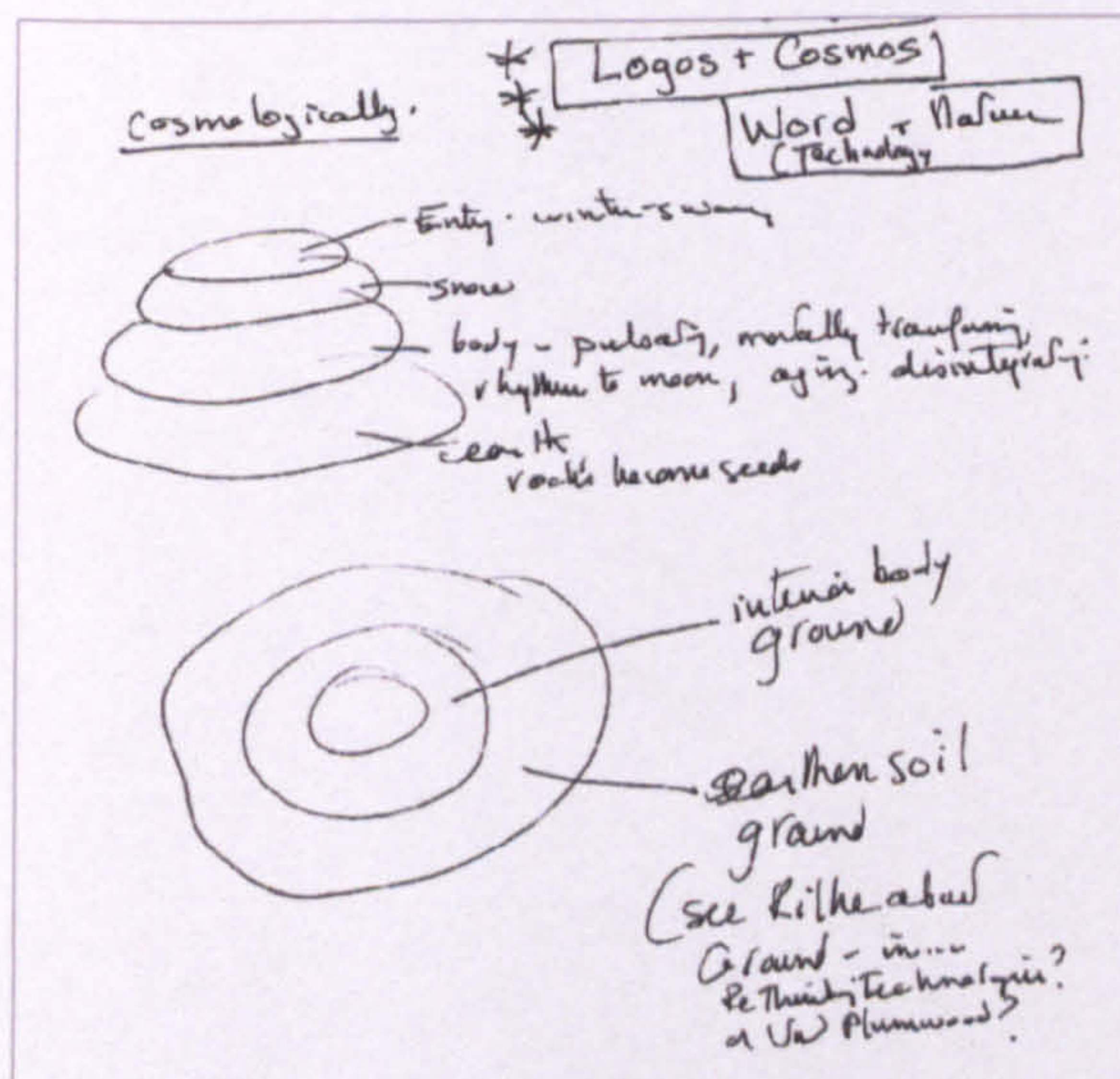
March 31, 1997 Notes from the country:

Interior Body should be situated directly below the snow: forgetfulness, sleep, the layer below the frozen Winter Swamp. *Interior Body as existential ground.* Earth is below Body, for that truly is the ground we return to. Entire world is enveloped in the Interior Body, and then enveloped in the Under-Earth (making the statement that there is *no* transcendent God).

Ephémère, like a seed, is a sphere: And the heart of it, i.e. where you enter, is frozen at first, then thaws, and if one remains there, one pours into the river. The emphasis changes from the Winter Swamp (the *Osmose* Clearing revisited) to the spherical onion-like layers, the enveloping womb, of body and earth. As discussed, the Interior Body ages through time, and dies, for it belongs *in* time, linear time. (And could be washed in crimson with the waning moon) The Under-Earth however does not belong in human time, however much it has a history, and humans have/are altering it. On a metaphoric, archetypal level of fecund fertility, it is from where life springs, and where life returns (all the efforts toward DNA cloning and cyborgs notwithstanding).

And in the Under-Earth, at the appropriate time of year, the rocks themselves (without changing scale) become seeds, thousands of seeds, waiting -which then send pale root tips down, then shoot up into the light. Rocks/Boulders become Seeds, rocks become organs, organs are seeds.

The interior body is ground, as earthen soil is ground.



Cosmological Structure of Ephémère
Ephémère Working Notebooks, March, 1997



Spatio-temporal Structure (Depth & Temporal Passage)
Ephémère Working Notebooks, 1997

Structure: (participant movements to and from):

From Winter Swamp, the Immersant can: move up into snow (will reach Interior Body, will reach Under-Earth; move quickly and go to darkness; wait and snow will melt, sound of river will become louder, rivers appear everywhere; descend into snow (not too deep); descend into Interior Body and then move in any direction; descend deeper into Under-Earth and move in any direction; if one rises up from Under-Earth, one does not however do not find Interior Body, but if soon enough, seeds germinating and *opening* into a meadow?; if one rises up from Body, one does not find frozen Winter Swamp but after a very short time one would find thorns, and if after longer time one would find what?; or one can move horizontally from the Winter Swamp, and it will shrink to become a rock beside a river.

Almost all of these consequences are time-based as well as spatial. We need to work on day and night cycles, and set in seasonal transformation, over fifteen minutes. The narrative: begin Immersion by revealing the archetypes around them, with a periodic table? How? And then white fog of forgetting, and then frozen Winter Swamp, and horizontally rivers and Forest Landscape, and below, the interior of both Body and Earth.

Inter-responsivity: Depending on day night, season, length of time in Immersion: various elements will change; including aging body, menstrual body, dying body; sprouting (seeds) rocks; rocks pushing up in spring; speed, volume and sound of rivers.

Depending on Immersant's relative range of speed to stillness: Winter Swamp will turn to darkness < > frozen Winter Swamp will thaw and rivers run; elements will not be receptive to passing through < > can only pass-through into other worlds if one goes very slowly; elements will not transform as noticeably < > elements will transform; pulsations and comings and goings will be not be noticeable < > more noticeable; less sound and activity < > more sounds and activity; weak colour < > colour will become more saturated as one goes slower.

Depending on Immersant's direction: spatial.

Depending on Immersant's proximity: as one approaches more quickly, elements will freeze; as one approaches slowly, slowly and closer, elements will resume their motions, and even flicker, becoming more saturated and luminous to signal their receptivity for the Immersant to enter.

Depending on Immersant's gaze: linked to their speed and proximity (see above), elements will become receptive.

Depending on Immersant's breath (and heart beat): should affect Interior Body, difficult perhaps to affect other elements because Immersant cannot control.

Everything has a pulse, a rhythm, coming into being and passing away.

April 1, 1997 Lab notes:

Thorns. The reminder that underneath, the Interior Body is *ground*. Ashes to ashes. One of the goals of this work is to remind us of our mortality. Thorns represent being born into suffering. So we try the thorns at the beginning (recalling the *Osmose* grid.) One is born into the frozen Winter Swamp from above.

April 2, 1997 Lab notes:

Winter Swamp: Trees are more abstract now, no branches. I look at Georges' attempt at thorns, too curvy, too calligraphic.

Interior body: Skeletal structure for bones: interesting because it disperses as one goes closer and becomes ambiguous. We are make the body less literally recognizable, so one does not read it as a body all the time. We can change the scale later, maybe towards the end, allowing the bones to become larger, perhaps the Interior Body becomes more and more bones as things die into the Under-Earth, in a reference to mortality.

River: if one rises up, and we turn off the fog, the river could become a *symbol*. Or we could see another river rising, and one could move towards it to find it is a vein leading back to the Interior Body.

We now have nearly five scenes: Thorns, Winter Swamp, River, Interior Body, and Under- Earth. But we are still a tourist.

April 18, 1997 Notes written after experiencing the megalithic tomb New Grange in Ireland:

Ensuring the "Return of the Light". Could Ephémèra [*this is the first time I use this word as the title of the work*] have long narrow slits in the earth, like in a small painting I did once in the early '80s, through which a numinous light could flow? This could be vertical or horizontal. Could be symbolic, representing, no, *marking*, seasonal cycles and lifespan, i.e. as *markers* of passage. This, a recurring element in many of my paintings in the '80s.

The Interior Body could be, rather than a horizontal space as I have conceived it, *vertical*, a space that goes deep, and if one passes out through its sides, it is through translucent skin into the light of day. So if someone wants to descend, they can go "deeper" and "deeper" into the body, not in terms of scale as in microscopic, or molecular (which would be the conventional expectations) but rather *primordial*.

In the depths of the Interior Body, one could get down to *bone*, through darkness of interior flesh and heartbeat to luminous *bone*, as if a return to white fog. And the bone can also appear as rock, white quartz, but here is not death (except at the ending of the immersive session) but regeneration of life. For in the heart of those bones are both: the ashes remaining of a human life, scattered and lost; or the white blood cells, which upon flourishing fill the body's self with life energy and joy, as is experienced when rebounding from chemotherapy.

[These references to bone, especially in terms of regeneration of life, have their source in my medical experiences surrounding breast cancer several years before, including chemotherapy, whereby after having been poisoned nearly to death, one's energy wells up and overflows (literally, like a wellspring) because the white blood cells are beginning to flourish again in one's bones (hence one's bones come to signify the wonderful regeneration of life); and also my experiences in having nuclear bone scans, whereby I was able to see through the opaque boundary of skin into my own skeleton, which was presented as semi-transparent phosphorescent-green particles, scattering in real-time.

Journal entries from that time record the stunning impact of seeing *through* my own body and into *bone*. In 1992, I wrote:

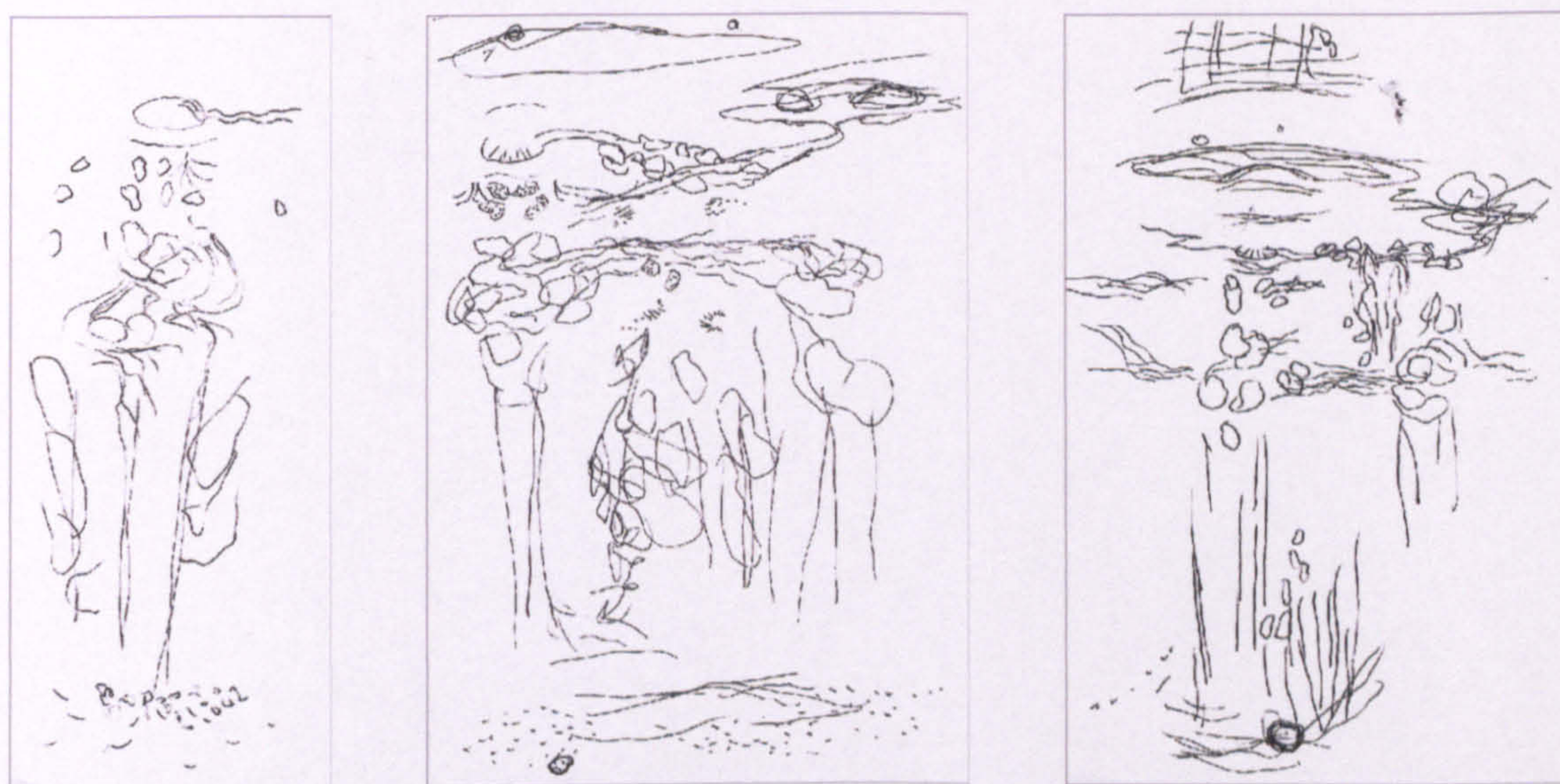
"The world marrow, bone marrow – seeking among these elemental archetypes, the source of life. Is it in the marrow, do stones have marrow, the long bones generating blood cells, life generating, sustaining, before the return to dust and minerals, and leaching into the soil?"

And in 1994, I wrote:

"Bone scan, ghostly luminous particles against darkness, density of bone being the most luminous, the most light, most white, eerie, beautiful, immaterial."

This could be a way of manifesting the "eternal return" in the work. Similarly, if the immersant moves horizontally from the Interior Body, more and more veins appear, and less body organs, veins like interlinking roots under the subsoil, as extensions of the interior body, could even... link into another body... creating an eternal re-incarnation as well. Only if the immersant rises up from the Interior Body do they encounter the world again, through sight. Inside the Body, it must be dense and close and moist and wet with resonant sounds and presence. Equivalent to the "depths" of the Body, is the Earth. We need a sense of being located in time-space within enveloping horizon, as the creators of New Grange knew. And if one sinks into the stone, one's own body is there.

In this new work, the *interior felt* body, the flesh and bones of one's own body is equivalent in emphasis and presence, to the "world", the life-world of earth, and stone, and roots, and blossoms and creatures, space, light, and water. This is a continuation of the themes in my paintings – as evidenced by the 1987 exhibition title *Espaces Entrelacés* – interior body space and world space combined.



Under-Earth with Elements of Rocks and Boulders Rising Up, with Vertical Bones in the Body
Ephémère Working Notebooks, April, 1997

April 19, 1997 *More notes from Ireland (Beechee Head):*

Under-Earth: rocks/boulders in horizontal layers of orange reds, ochers and grays. Representing time, geological time. Rocks *rising*, not pebbles but rock, massive force, shear walls. The slow upheavals of rock layers could be between layers of the Interior Body. Also between flora and roots, so that there are horizontal intervals repeated (like *Osmose's Forest*) of body, earth, rock, earth, body, rock, etc. All are grounds of being, successively, relationally, and in correspondence. The rock strata does not inter-respond with the immersant, for the rock's being is *beyond* human time, its forces moving with millennia, impervious to human action. Also as in bone, occasionally there are sheer canyons of rock, so that the immersants could have the thrill of being at the edge, and vertical, perhaps that the bottom is there is sea. Rocks, in their comings and goings (large stones, boulder size) should perhaps rise up out of the earth, and wear down into it.

Similarly, trees and vegetation could perhaps *rise up* also (as well as *reach down* in terms of roots) *and then withdraw*. This way the various pulsations of coming-into-presence or un-concealment and passing-away-into-concealment are related to growth and withering...

April 23, 1997 Lab notes: n

Technical Summary: Shape-morphing, can do this several at a time. [...] John has collision detection development in progress. We are working with additive colour now, as opposed to subtractive with *Osmose*, so the colour can be more rich and luminous. The fog also comes and goes, allowing elements to be seen and then obscuring them. So all the way through the work, the sense of coming into being and passing away is now being expressed, through form, light, colour, flow, fog etc. This is far more powerful than the more illustrative notion of particle flow as I had originally imagined for the work.

April 23, 1997 Lab notes:

Seed: A new scene, of Seed, with roots and *blooming*. I suggest that a white symbolic shape appear in the interior of the Seed, like a symbolic opening or "doorway" of light, then a transparent lobe or two lobes, of blue, pale blue expanding around that vertical opening, and filling the interior Seed – then the white rootlets go down, and become larger in relation to the Seed, and *then* the Seed starts to push up...

[The "seed" is another recurring element in my work, as seen in the paintings, and digital still images from the Interior Bodies series, below. This element of seed, with its associations related to germination, is indicative of the recurring theme of emergence from interior hidden depths, and of becoming, as blooming, *opening* into the future.]



Seed (Stone) 1986
oil on board



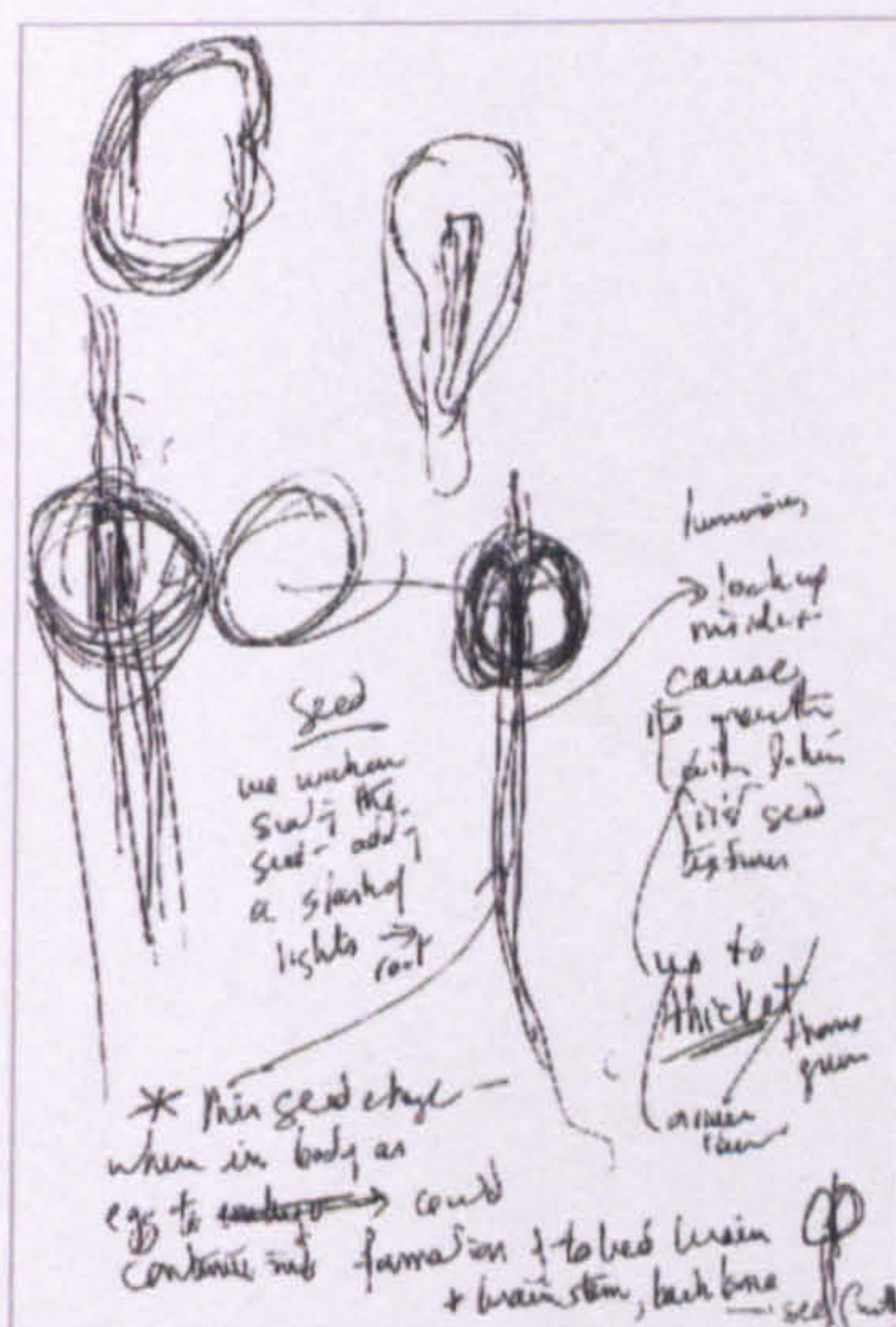
Blooming 1986
mixed media on paper



Seed 1991
3D digital still image



Blooming (Life Vessel) 1990
3D digital still image



Seeds
Ephémère Working Notebooks, May, 1997



Ephémère Under-earth with Seeds, Rocks, Bones
Ephémère Working Notebook, May, 1997

We work on scaling the Seed, adding lights at its root. Luminous. Looking up when one is *inside* it could cause its growth. This Seed transformation, if re-contextualized in the Interior Body as an egg, could continue into formation of a lobed brain, and brainstem and backbone...

May 8, 1997 Lab notes:

Seed: with tendrils and roots. I want them to be larger, and to appear (i.e., come into being) very close to the Immersant, and perhaps they only appear when the Immersant looks up or down. Seeds should be like a reflection of a candle flame, warm yellow (fire, flame as in Bachelard⁴¹). Flame flickering softly, and there beyond the flames, a warm luminosity, is a pale transparent white *corridor, a doorway, of light*, vertically stretching above and below.

May 9, 1997 Notes from the country, after long walk in the woods:

Seed: Yesterday I showed Georges the reflection of a candle flame on the dining room table: we were both struck by how similar it was to the flame/life we had just constructed in the Seed. Very close. And how when something passes by the flame, of course it flickers. So in the *Ephémère* Seeds, this light can flicker, flame, also in response to any element (including the Immersant) passing nearby, creating an inter-responsivity.

Later that night, I also realized that the word "bonfire" is from bone fire. The element of "bone" in *Ephémère* is not merely a spatial canyon with a sea of blue sky or blood below, but instead, temporally, after certain amount of time has been spent within, the element of bone either dissolves into the Under-Earth, or, if near the Ending of the Immersive passage, is consumed by white fire, a burning out, of whiteness. So bone passes to ashes through flame, or returns to dust, through earth. This approach is much more temporal, of elements transforming into other elements, rather than the Immersant moving to different locations/spaces. Not a dozen spatial realms, but one realm with a dozen or more transformations. *Timing instead of space.*

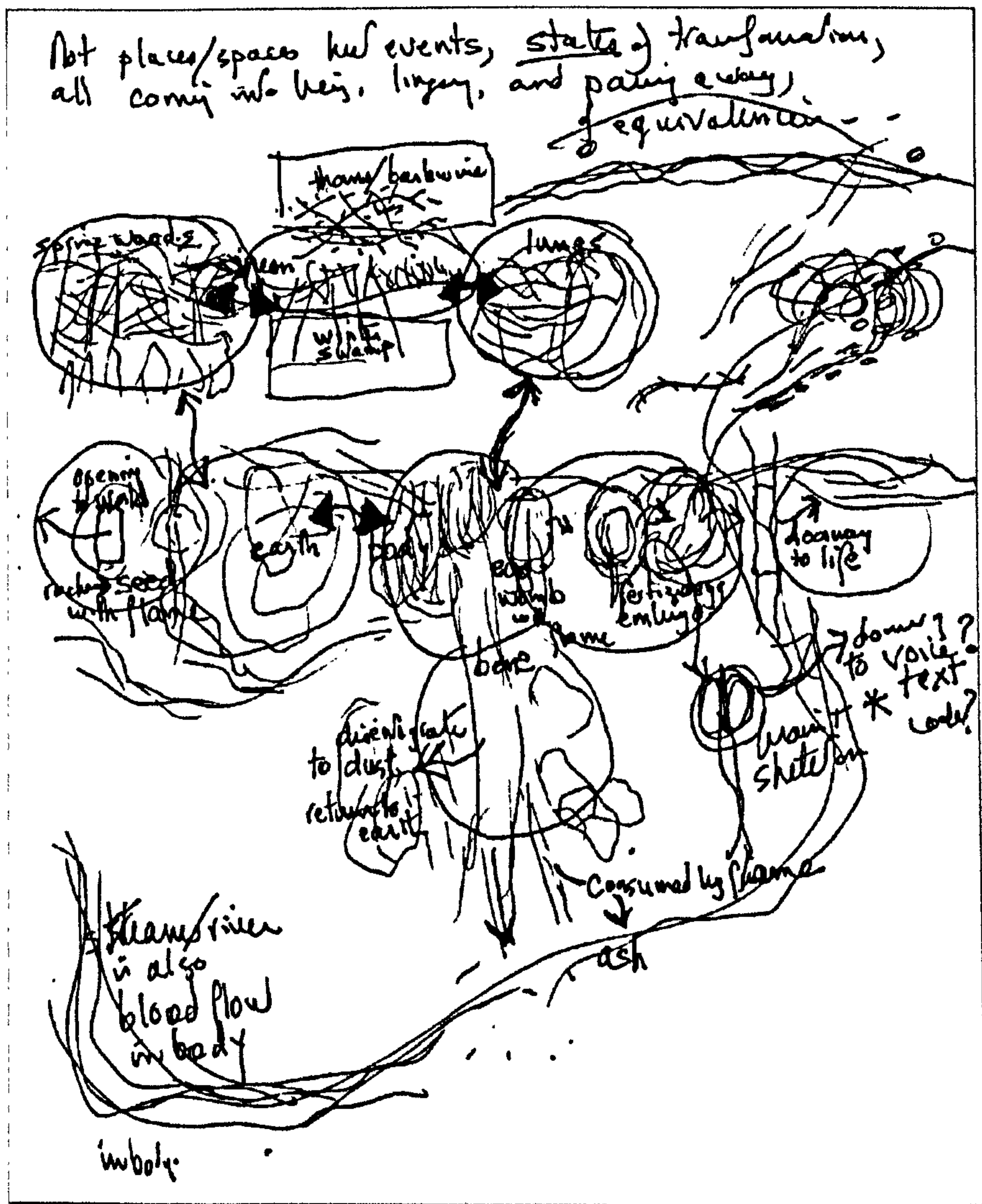
These recurring elements, are my own numinous archetypes that integrate body and earth, interior and exterior: roots, earth, seed, water flow, encircling horizon, stones, openings (doorways) of light, bone, vessels, veins, womb.

May 10, 1997

Seeds: If the Immersant were to rise up from Interior Earth/Body, through the Winter Swamp of snow and dead trees (*burnt* trees, dead through flood or fire), there, with the Immersant's own rising, are the budding Seeds: their slender white tendrils, upon reaching light, burst into bloom, and all around are slender gray lacy branches of young trees, gray-rose of their buds which close-up are flames of sienna, and green pale on the ground.

Forest Landscape: There is no clearing, only pale lacy forest – the laciness reminiscent of the bramble thorns and barbed wire – but resurrected in life. There would be no green, no leaves in this forest as in *Osmose*, but only gray (but eventually this would become a sea of green perhaps with the lacy branches now interwoven "veins" in green). The "veins", as a recurring element, of roots, and veins in Body, veins in Earth: If the Immersant remains here longer, the green sea of veins becomes Body, lungs. The veins are the tiny vessels in the lungs, and the lungs are breathing.

⁴¹ Bachelard, *The Flame of a Candle*.

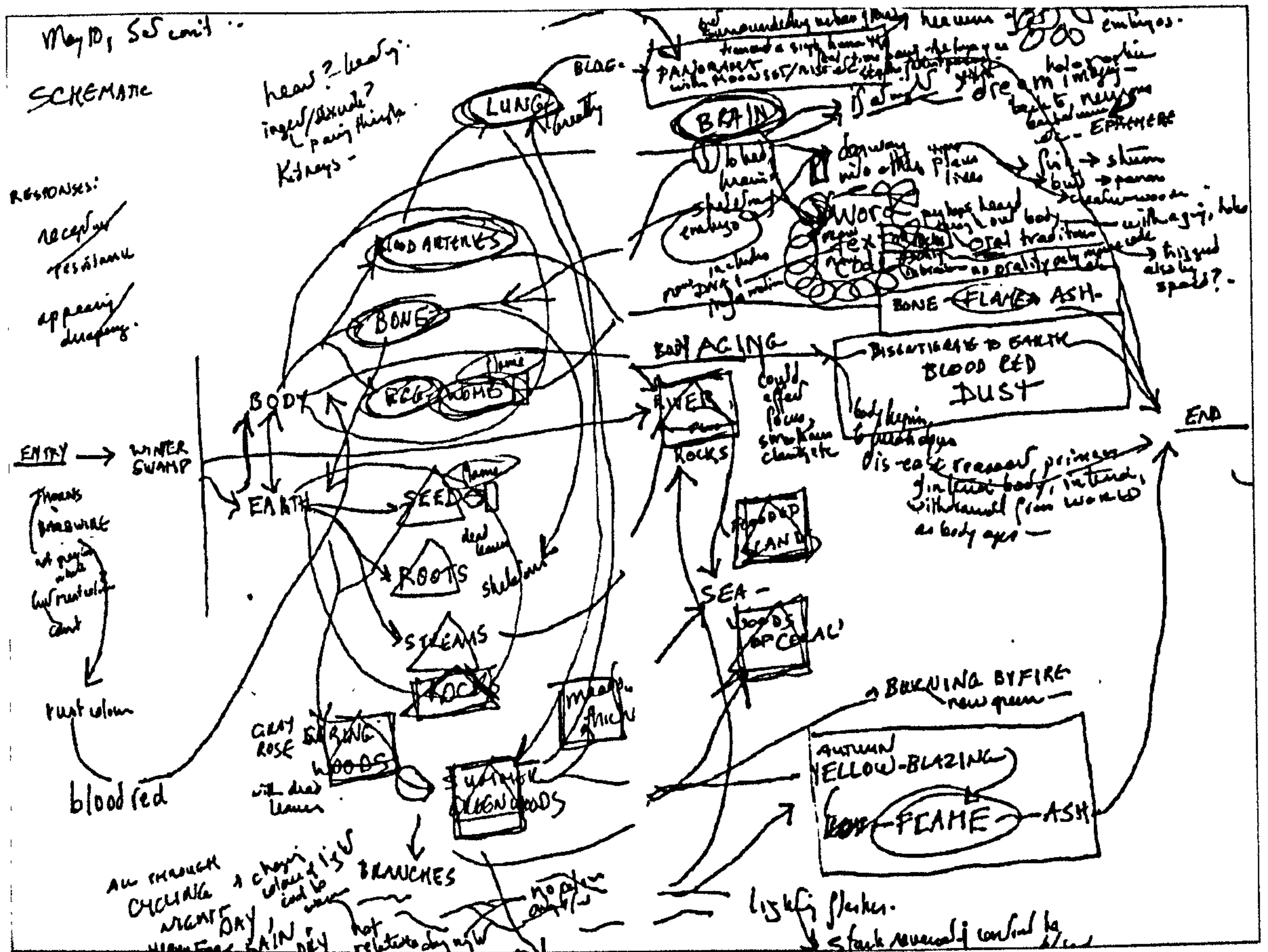


Ephémère as States of Transformation
Ephémère Working Notebooks, May, 1997

Not places/spaces but *events*, states of transformation, all coming into being, lingering and passing away,of symbolic, metaphoric *equivalencies*.

Metaphorical Equivalencies:

- Forest = lungs
- Earth = Body
- Rocks = organs
- Seeds = eggs in the womb > as fish or bird or creature
- Roots = veins
- Stream/River = veins and blood flow,
- ? = bone to flame to ash



Schematic Spatio-temporal Structure with Realms & Elements
 Ephémère Working Notebooks, May 10, 1997

May 14, 1997, Lab notes:

Here is a chart of the metaphorical equivalencies or co-equivalencies of the various recurring elements in all three levels, of Interior Body, Under-Earth and Forest Landscape.

<u>Interior Body</u>		<u>Under-Earth</u>		<u>Forest Landscape</u>
eggs	=	seeds	=	bloomings
body organ	=	rock	=	boulder
lung	=		=	forest
bones	=	copper veins in the earth	=	trees
vessels/veins	=	underground streams	=	rivers
microorganisms	=	microbes	=	flocking herds ofanimals

All coming into being, lingering and passing away

Main insight of this meeting was that, rather than thinking in terms of worlds or realms, we really begin to think (and John to program) in terms of *recurring elements*: e.g., a rock may have more or less *rock-ness* or body *organ-ness*, which in turn may have more or less *lung-ness* or *brain-ness* or *undifferentiated organ-ness*, all depending on the context.

Thus the elements are:

rock = body organ;

seed = egg;

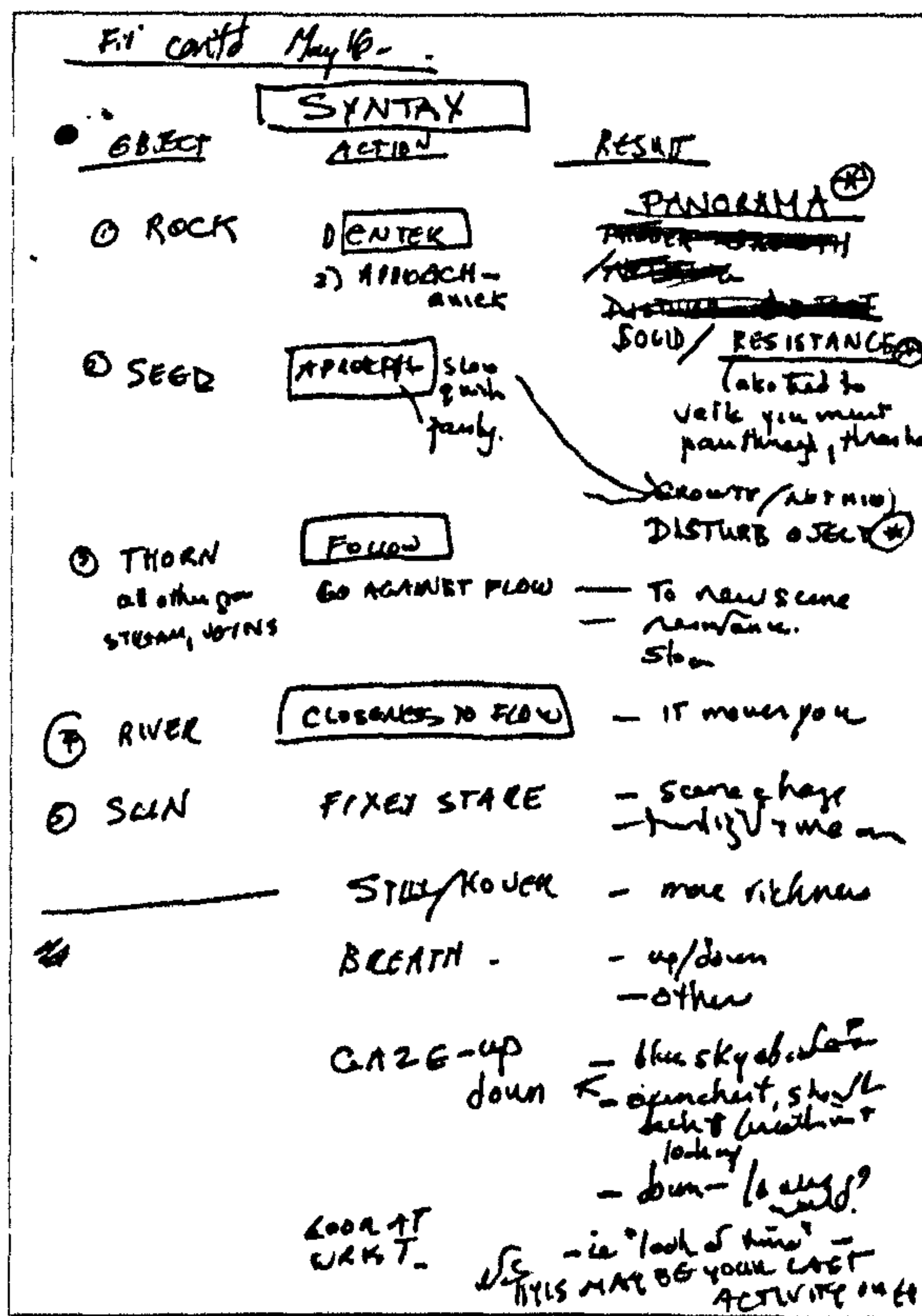
rock = lung/forest;

river = vein.

Their different versions are just manifestations along a continuum. This development will help with the programming and structuring of temporal transformations.

May 16, 1997 Lab notes:

We have now developed most of the aesthetic sensibility and poetic elements; now we need to develop more interactivity. We need *syntax* rules.



Syntax Structure
Ephémère Working Notebooks, May 16, 1997

May 21, 1997 Lab notes:

Can now enter Winter Swamp from above, below, beside - so Immersant's entrance can be different. Collision detection done successfully: so now if the Immersant goes faster, the rocks and boulder surfaces cannot be entered, *but* if the Immersant goes slower, one can slip through into an interior landscape. One can *slowly* slip through the earth etc. The roots, stream, veins recur and reappear in the

Forest Landscape (not with emphasis on leaves this time as in *Osmose* but on lacey delicate branches like a web); and in the Interior Body lung (same veins as in trees, similar to bone elements). *So the elements recur and recur.*

[Three-month suspension of the project.]

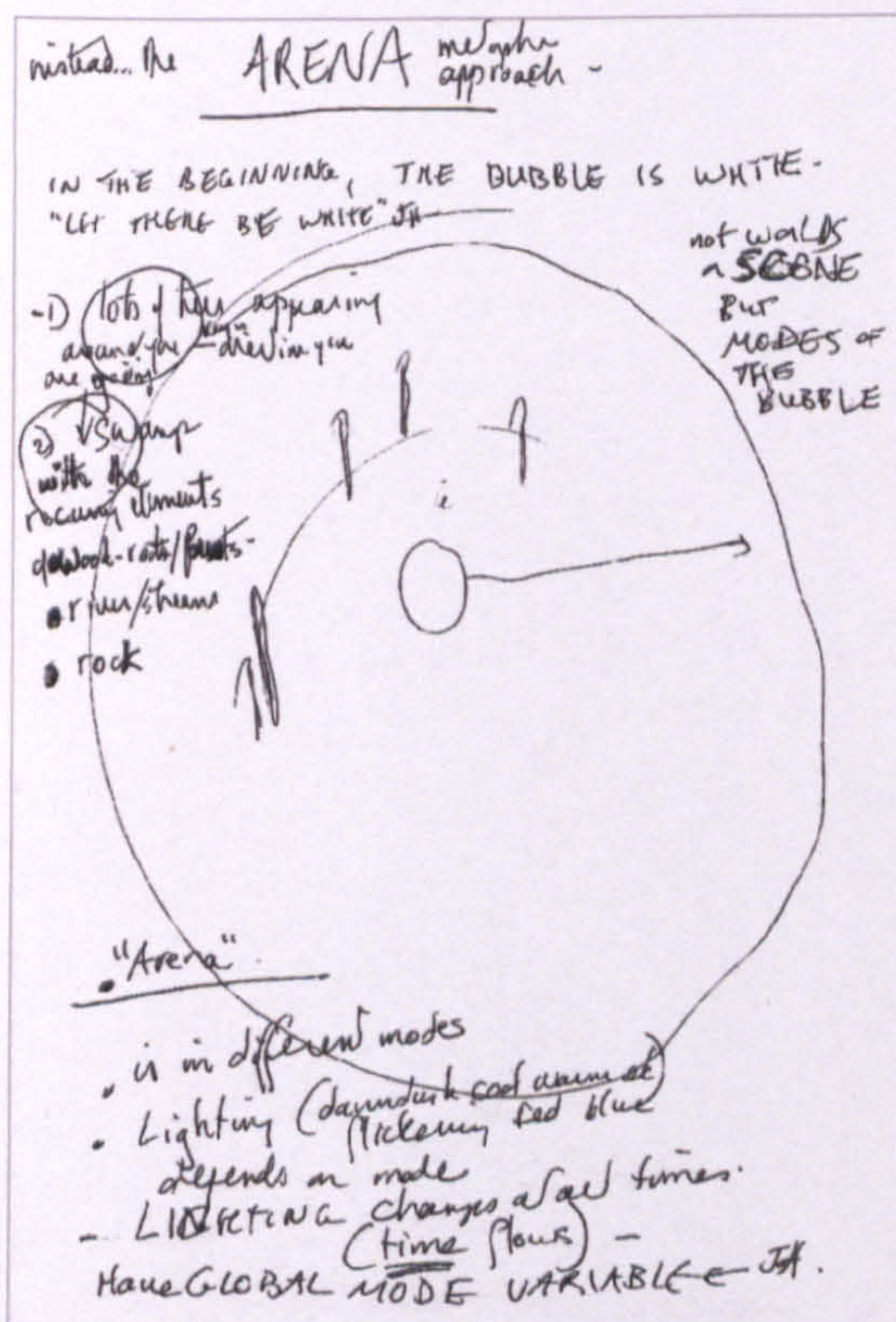
August 25, 1997 Lab notes:

Flickering flame streaming through bones. We discuss using brain waves (but would be inconvenient in public installations). Also, there are no alpha waves when one's eyes are open. We also discuss muscle contractions, heartbeat, temperature, skin resistance and stress level. Sound: heartbeat speeding up according to immersant; breathing sound of air intake and outtake.

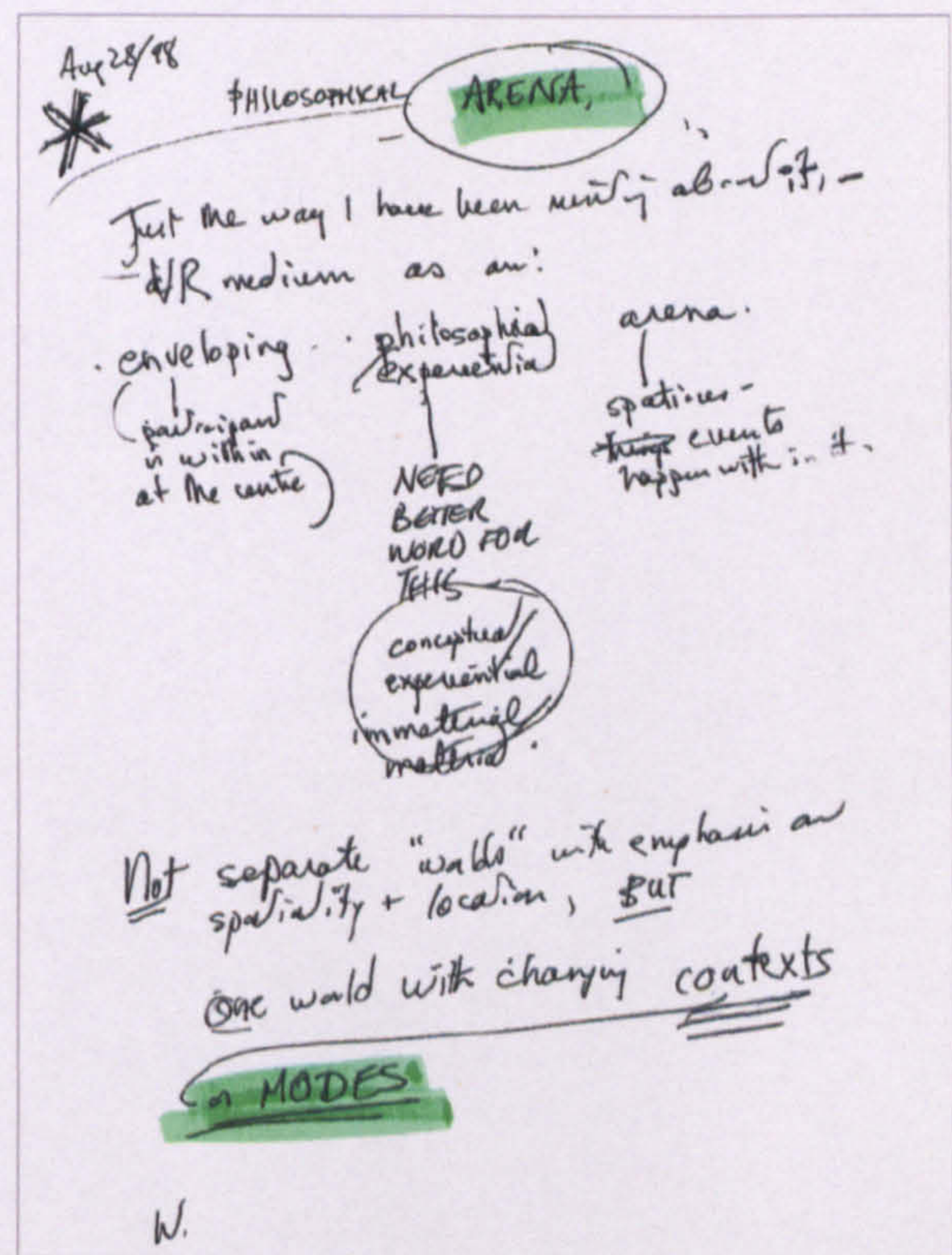
August 26, 1997 Lab meeting:

Major conceptual shift to thinking of the work as a spatio-temporal "arena". We run through the opening scenes of Grid, Thorns, Winter Swamp, Under-Earth, River. We discuss the transitions; perhaps starting in white fog (pure space). Looking at the Winter Swamp, I suggest having a fugitive ephemeral forest collapsing, ghost trees falling, in reference to lost forests, to earlier times of virgin forests. We start in white fog, and then go to thorns, and then into the Winter Swamp; but there is too much branching of possibilities, already a cliché.

We're not looking for separate realms, but *one* spatial realm which produces the recurring elements. And so we make a conceptual shift, to an "arena". Not worlds or scenes, but *modes*, of the "arena".



Ephémère as Metaphoric "Arena"
Ephémère Working Notebooks, Aug, 1997



Philosophical "Arena" with Contexts and Modes
Ephémère Working Notebooks, Aug 28, 1997

The "arena", as a metaphor of approach. In the beginning, the "arena" is white. Not worlds, or scenes, but *modes*. There are: 1) lots of trees appearing: the key is the direction one is we consider going; 2) swamp, with its recurring elements of woods/roots/forests, river/stream, and rock. The "arena" is in different modes: i.e. lighting (dawn dusk, warm cool, flickering red blue) depends on the mode. Lighting changes at all times (time flows). We consider having a "global mode" which becomes variable.

August 28, 1997 [see illustration above]

A philosophical arena. Just as I have been writing about it [in previously written essays on virtual space]: VR as an enveloping – philosophical *and* experiential – "arena": enveloping with participant at the centre; philosophical/experiential (need a better word for this such as conceptual/experiential or immaterial/material); "arena", spacious, events happen within. Not separate "worlds" with emphasis on spatiality and location, but *one world with changing contexts or modes*. An "arena" of time-space, which *reconfigures depending on the participant*. Within the arena and its various "modes" appear *recurring elements*, which manifest in various states depending on the mode and participant response.

August 28, 1997 Lab notes:

We decide that to avoid getting too complex, we should give up control and predictability for unpredictability. Design not only from the immersant's point-of-view, but as importantly, from the point-of-view of the elements. In terms of John's conceptual programming approach, everything therefore could be said to "watch" the immersant and everything else: for example, our first element of white fog would decide that now it is time to manifest a tree etc., and then another. *Everything thus becomes aware of everything else.*

For example: the "arena" (white space) watches time passing, and after certain amount of time, calls in a certain number of thorns, and then waits awhile, and fades in a certain number of thorns and so on, after certain number of thorns it stops. The thorns decide when to come in. The white space, or rather white *mode*, then calls in: a) a white fog which emerges and thickens and thins; b) a clump of thorns, which decide when thorns come emerge, coming into appearance and when they slowly disappear; c) one thorn can bring in the river, and twilight fog, and trees appearing around the immersant, and disappearing.

September 10, 1997 Lab notes, first group meeting with our sound crew, Dorota and Rick, who are here for the next three months. [The reader should refer back to the e-mail written on Feb. 10, 1997.]

The challenge remains to make the work more temporal than spatial: to have an arena of transforming recurring elements. To look at things from the point-of-view of the elements, not like in *Osmose*, and to do this with the sound also. Sound: creatures, bodies as "recurring elements". Breathing and heartbeat. Sound of the environment, using location-based sounds, and sounds of the body (using viola?) Perhaps we will have flashbacks of sound, and visuals, before the ending.

September 11, 1997

We look at the video footage of various tests to get a perspective on the work so far: Rather than branching, we need to think of the structure as an arena with elements coming in and out, think not of details or results or building specific scenes, but of principles based on participant behaviour.

September 12, 1997 Lab notes:

Serendipitous breakthrough! For no known reason, the Mountain Landscape scene is on at the same time as the other scenes. And so the Winter Swamp's trees are now glimpsed in the Thorns, and there are streaks of pale sky against the white of the Swamp that derives from the Mountain Landscape, and then in the Winter Swamp we were aware of the Mountain Landscape's striped spheres without even knowing what was going on: very perceptually interesting, because it made no sense, with layers upon layers of transparency.

We then became aware that we had entered the River, but the Mountain Landscape was still there, "under" the surface of the blue-gray water flow, and its hills and sky texture of warm sienna and dark ochre gave a rich abstract context to the River. And in the Mountain Landscape, the river elements were equally superimposed, so that the River particles and the rocks were in the Mountain Landscape. The superimposition of textures was extraordinarily satisfying. In the Under-Earth, the superimposed Mountain Landscape with its enveloping warm sky creates an enveloping sense of place.

If we could have everything present in the "arena" at once this would be perceptually very rich, and to optimize the frame rate we could turn elements on and off. Rich sensuous warm medieval colors: exquisite. We need to think of elements, and then allow super-impositioning to randomly happen: *This becomes a new principle.*

[We had been working on several landscape realms, including the one mentioned above, Mountain Landscape, which consisted of brown mountains and valleys, viewed from an aerial perspective so that flocking animal migrations (consisting of particle systems) could be seen as small specks below. Eventually we decided that this particular landscape realm did not fit into the work as a whole, and instead later adapted it for use as an Interior Landscape accessible by gazing into the Rocks/Boulders in what became known as the seasonally-transforming Forest Landscape.

What I am referring to in the notes (immediately above and below) was a serendipitous error, by which the brown mountain landscape scene had been mistakenly loaded from the database so that it appeared superimposed over both Winter Swamp and Under-Earth. As a result, its various compositional forms, colours and textures, were occupying the same space, at the same time, as those belonging to the other two scenes/realms, creating a very rich spatial ambiguity. We recorded several "fly throughs" of this on to video, which is how we discovered the error. Unfortunately, as much as I might have wanted to repeat this effect and use it as an underlying principle in the work, it was not possible, because loading and rendering two such scenes/realms simultaneously was extremely computationally heavy, and therefore would have reduced the rendering frame rate to such a slow pace that any sense of "real-time" interaction would have been lost.]

September 16, 1997 Lab notes:

Going through the work again with the team. Winter Swamp: always frozen and still, except for the trickling stream. Ghosts of falling, softly screaming trees (as if we are *hearing* another time). Under-Earth: white roots now seem like neurons; rocks push-up and solidify; seed shoots should be more noticeable; need the surrounding texture of mountain landscape. Interior Body: veins of flow ebbing and flowing. We need a way to map the Immersant to Interior Body. Forest Landscape: the Immersant moves into a rock, only to find an Interior Landscape *inside..*

Such inversions of meaning, context and scale similarly were present in the *Osmose* Life-world. In this way, the immersant is linked to "space" but only indirectly, not by direct linear action or interaction but "inter-responsivity". *I want the immersant to feel connected, to "navigate from the inside"*.

September 17, 1997

The question is, what happens? We have made an effort to move *away from spatiality to temporality*. We now have an "arena" which calls in fog and thorns, where things "watch" what is happening, i.e., in the Winter Swamp "mode", the Thorns would watch if you are following one and would call in a tree (this could also be time-based); certain trees could call in the River (what we are now calling the "River Sliver") and something could decide if the immersant has been in the Winter Swamp long enough, and then call in a Rock/Boulder, and then call in the Winter Swamp's encircling edge. If the immersant gets too close, then the Winter Swamp could scale down thereby making the immersant feel relatively larger. The Winter Swamp edge could call in a variety of other enveloping elements – very difficult to script this – for example if one gets too close to its encircling edge, the Winter Swamp could shrink around the immersant, and then the immersant would realize they are in the Interior Body "mode" now. So is that what happens when we approach the Winter Swamp edge? the enveloping archetype can bring in an enveloping lung, or earth or landscape or seed, etc.

We need to be very careful about our vocabulary here. If the immersant simply stays in the Winter Swamp mode: the "River Sliver" could decide to become a "bloodstream"; the trees may become bone; rocks become bone; the river could also become an underground stream. What behaviour will cause this effect and why? location; speed; how long the immersant looks at an object (for example the Seed watches the immersant watch it, and then germinates in response).

Simple rules: if one moves out to an edge of something, it shrinks; if one moves into an object, it gets larger; when time passes, something occurs; if one looks at something long enough, things happen *inside* it. For programming purposes, the immersant becomes an element in the space like all other elements, *all engaged in "responsivity"...*

Notebook # 3 Sept - Dec 1997

Sept 27, 1997

We need to establish principles of interaction, when introducing elements: i.e.: the river *sucks* the immersant into its flow; if staying within it, this could lead to somewhere else.

Winter Swamp Transitions: add a flickering intensified luminosity to signal change of mode from early *passive* swamp mode to inter-responsive *active* swamp mode. *Spatial transitions:* If under river? If following river? > River scene; if approaching edge... the scene scales and "shrinks" into a Rock/Boulder on the side of the stream. *Perceptual transitions:* If staring at a Rock/Boulder ... an Interior Landscape starts to fade in, inside the Rock/Boulder; if immersant looks around (and behind) during passive swamp mode, the Winter Swamp will still be there; if immersant look around (and behind) during active swamp mode, an entirely new scene appears; if the immersant is floating up but looking down... the Winter Swamp will scale down and shrink into....; if floating down and looking up, it scales also...; if under the stream/river, the Winter Swamp moves into night time; but if immersant moves back up above, it returns to white fog; if immersant gazes at a tree, there will be a tree falling, or small trees falling. More transitions in the Winter Swamp: There could be a time-based default which might take place after, say,

three minutes, such as the Winter Swamp could get dark, or could go white; if "gazing at a tree"... a tree falls; if "gazing" into a Rock/Boulder ... an Interior Landscape "opens".

What about listening? If turning to hear a sound... then a transition. If the Immersant is still, this brings in more trees, if they go faster, less trees and complexity (but this is not a transition!). We need non-time/spatial based transitions also.

Another principle: avoid the cliché of portals. Spatially passing into or through an element does *not* create a transition of mode, but only an ephemeral effect that fades, whereas *focused attention* to visual or sound would create a transition of *place*.

Principles include physical forces:

a) Winter Swamp (and Forest Landscape): being sucked into river/stream, to then feel ease of motion (need static elements), wind and blowing snow;

b) Under-Earth: underground stream flows, gravity pulling down, rocks rising up, tremors;

c) Interior Body: stream flows through veins and arteries, cellular flow, also "surge" (familiar to scuba divers), and all streams and organs pulsating to heartbeat.

Sept 29, 1997 Lab notes:

Thorns: now abstract, pale, ambiguous, with fog; a *pulsation* of coming into being and passing away. The Immersant could go to the thorns, and see them in different colours, such as red brown; then they bud, amid green; then blossom; then decay, their petals carried away, scattered in wind.

Winter Swamp: new version of river has mesmerizing flow. Rocks/Boulders have textures of other landscapes inside them. River should be more complex in shape and flow. In response to the test of the ghost tree falling: a strange unexpected spatial effect, but still too three-dimensional, too recognizable as the *Osmose* tree (which indeed it is), should fall towards the Immersant not away. Snow falling and blowing in the wind works well. We need to add the Mountain Landscape sky to wrap around the swamp to create a spatial complexity. The Winter Swamp's river should appear to *widen* so that if the Immersant passes below its surface, its breadth fills the entire view above and looks like black night sky with ghostly pale trees (the effect reverses tonality, making the dark swamp trees become light, and the white fog become black like a night sky). This subverts Cartesian xyz spatiality, as does finding landscapes inside the rocks. Principle: *everything should be mutating at all times, in constant flux*.

Interior Landscapes: within Rock/Boulders. Gazing at a Rock/Boulder: if the Winter Swamp is in its passive mode, and the Immersant looks around, the Winter Swamp trees will still be there; if active mode swamp, as the Immersant looks around, a new Interior Landscape surrounds them. Each Interior Landscape could be different: location; geological change; weather; day and night cycles; light (direction, colour etc.); wildlife, animal herds migrating; cycles of sun and moon. Perhaps because of limited time available, we should limit this to two Interior Landscapes only, and all their permutations.

[Because of our time limitations in terms of production scheduling, we limited ourselves to two "interior landscapes", even though originally I had wanted at least a dozen. In the final work these two landscapes consisted of: a) the Mountain Landscape which became accessible by gazing into a boulder in the Forest Landscape; and b) a white and gray wintry Arctic Landscape which became accessible by gazing into boulders in the Winter Swamp. We deliberately thought of these landscapes as perceptual illusions or mirages in that after appearing (coming-into-being) and enveloping, surrounding the Immersant, they would then linger for a few moments, and then fade

away, leaving the Immersant in the same place as before. We did not want them to become full-fledged spatial realms in which the Immersant could remain.]

Interior Landscapes: 360x360-degrees, emphasizing use of enveloping three-dimensional space and rewarding the Immersant for looking all around: if one gazes at the East the sun rises; if one gazes west, sunset; if one travels away from the landscape in any direction towards its edge, it scales down until it is a small sphere or rock, then what?

Transition: from Interior Landscape to the Interior Body realm could be dependent on: moving closer to the Interior Landscape (how close?) so that streambed becomes bloodstream or vein etc.; could have all compositions ambiguous, so stream/vein (or bloodstream) could be *both Landscape and Body simultaneously*. This would equate the interior's golf earth with body at the beginning of the work: Transition from Interior Landscape: the Immersant could look up, below, behind, and see another "mode", such as Interior Body. We may want to discourage the desire to go close however (we do not want Immersants to do a flythrough like a military simulation of Mars) for example: If Immersant descends, fog; if Immersant goes too fast, then fog, as a way of making them stay still.

Oct. 8, 1997 Lab notes:

Watching Georges in the HMD: Perhaps, as one moves through the work, from beginning to end, and one goes through one's own lifespan and death, and as the seasons turn, then perhaps, so also do the trees and life etc. gradually become more impoverished?

Oct. 10, 1997 Lab notes:

Forest Landscape: Experiments to try, based on principles already explored and established in the Winter Swamp include: if the Immersant is descending, falling consistently, there can be a slow fade into Under-Earth; if the Immersant reaches towards the edges or rises to the perimeter of anything, the Forest Landscape can shrink; if the Immersant tries to move outside of limits, the Forest Landscape and surrounding cloud sphere would shrink with only a cloud sphere remaining which would become a rock in the Under -Earth -- or a River would appear in front of the Immersant moving them to another scene such as Interior Body. Thus River becomes a conduit in space. Other Forest Landscape principles (summary): sun and moon cycles (warm colours to cool blues) should be dependent on stillness so that even if the Immersant doesn't see the sun, the light would still fluctuate. We would allow the Immersant to enter the Forest Landscape at certain optimum entry areas. In the Forest Landscape, as if seen from a long distance, flocking herds (represented by particles) would appear and disappear *depending* on the Immersant stillness. Stillness on the part of the Immersant would bring in more and more specs or particles representing creatures: These would follow certain paths like wildlife corridors. This brings up another key principal: there would be *flow of life in all modes*.

Oct ?, 1997

Summary of principles: Everything should be coming into appearance, and going out of appearance. Nothing should be static or still, and nothing should be empty. Transformations or changes to all things should be caused by: a) world order (unresponsive to human participant); b) Immersant; c) each other. Transformations via Immersant should be due to: gaze; spatial location; stillness; movement/speed. Everything, including in all modes (i.e. Winter Swamp, Forest Landscape, under-Earth, Interior Body)

should become richer (visually and aurally) the longer the Immersant stays there. And we could even add in another scene simultaneously to increase ambiguous complexity.

Structure: if there is a "ground", it should be all Interior Body, which is *all* bodies, *always* in flux. Therefore, from Landscape, going "down" should not take one only to the earth, but if one sees a river as a vein, one is in the body. (Am I privileging the biological body here? *Yes.*)

Principles of responsivity: Some elements should *resist*, i.e. one cannot enter them right away or at the beginning of a mode; one must remain there, and be still. Also, elements should not only be acted upon, but also *act* on the Immersant. How?

Not a world of objects to be acted upon, but *fields of awareness* that can act as well as be acted upon.

Not immutable, static, firm, solid "ground", but shifting, fluctuating, mutating. The ground is flux; one has to *accept* this flux. (Nothing remains the same, everything flows, and the only constant is change.)
There are no spatial grounds in Ephémère, but only temporal embodiments within embodiments, nested and giving away to....

October 29, 1997 Lab notes:

Sound: we need two or more flows of sound: the sound stream of "natural elements", i.e. prerecorded sound effects as well as the stream of "music", melody. These streams should intermingle and be affected by what is going on and the Immersant behaviour. The sound, and imagery, and Immersant should be entangled. Need sound effects from everything not just music. Sometimes an "utterance" can signal...? Sound should be affected by: gaze/staring; location/stillness/movement of Immersant; world order: dawn/night etc., wind, direction of wind, up wind etc. Physical forces should affect Immersant, visuals *and* sound. Sound should be completely entangled with visuals and Immersant inter-responsivity. *A nesting of visual forms within forms, all over, and a nesting of sounds within sounds?*

Sound tests: In the Winter Swamp: sound could be sensitive to body, and speed, analogous to the thorns, soft and low etc.; could be related to the fog thickening and thinning; could be the wind, based on the Immersant's body movements. Trees appearing in the Winter Swamp now sound insect-like and very high-pitched, I want them to sound like knocking wood, and I want them to sound stroke-like, gray and transparent, where now the sound is lime-green, orange and pink. The falling tree in the Winter Swamp sounds like ghosts screaming, this is good. I ask for less "instrumentality", we need to pull back from the recognizable. Rick asks "How you construct something that is musical, but not predetermined in anyway?"

On other transitions: John has finished programming a transition from Winter Swamp to the Under-Earth. *Body and Earth are now the same place.* I go into the helmet to experience the transitions: 1) from the Forest Landscape going to the Under-Earth: mountains should be rock-like, to inverse the scale and all the mountains should transform into rocks. 2) from the Forest Landscape going to Interior Body: I gaze at the River in the Forest Landscape, and the River becomes red and becomes a close-up of a vein, with lots of little veins and arteries everywhere. This way the landscape *is* body and earth.

November 12, 1997 Lab meeting:

I go into the helmet, into Under-Earth: as the earth becomes more spatiality vertical, it begins to feel like the right space. We have now a very good transition between Under-Earth and Interior Body, because, as John says, programming-wise it is the "same scene" with the same models, only their behaviours,

textures and background colour changes. This becomes the philosophy of the work, and I want to incorporate it everywhere (although it may be too late because of our Impending exhibition deadline).

November 14, 1997

Interior Body: Contains elements of: rock/organs (large, medium, small); vein flows; flecks; egg, looks like *Osmose* Lifeworld; flocking sperm; bone. How to connect the Immersant body to the Interior Body realm? The Immersant's breath could: shift the interior colours from blue to red; affect the breathing motion of the organs; cause sound of breath and heart beat; and the Immersant's balance shifting around the spinal cord? (bones within the internal body are vertical and unmoving). We need to find more ways to connect the Immersant's own body with the enveloping Interior Body realm.

November 14, 1997

I suggest we begin to bring the recurring elements into the Interior Body, such as: collections of organs, *not* set side-by-side but as *inside* the body, and *inside* the rocks etc. I also suggest that we bring trees (from the Winter Swamp) into the Interior Body: as pale luminous long forms; scale them in x; clump them together; make them more golden. The result is very effective: they look as if they are lit by the body's warm light; they give structure, reference, and verticality which are much needed in the space. Especially after hearing the sound-in-progress, the Interior Body begins to feel dramatic. We must now begin to do the same thing with the interior Earth. Only 2 more weeks with the sound crew. We need to redesign the breathing vest. We are having a "gimbel lock" problem (mathematical) based on the body rotation.

November 15, 1997

Philosophically we need to emphasize: not a dichotomy of culture/nature or technology/body, but a "biodiversity" of many flows, all co-equivalencies etc. I.e. that the Interior Body is *many* bodies, many species of bodies (not only a subjective human body). As I write, Dorota is in the helmet: the tree "bones" in the Interior Body work well. We are now placing the tree/bones/walls in the Under-Earth further away. Dorota questions how we can use the head movement? rocks should *know* we are looking at them and change. We work on changing the colours of the Under-Earth further away from those of the Interior Body. In the Under-Earth, the rock should *not* be the same colour as the Body organs, nor the same size or shape, and they should not have the same texture. In the Earth, some rocks thrust upward, related to landscapes. Now in the Body, as the Immersant turns her head, the background colours will shift. In the Body, we need to add not small objects, but details in response to Immersant's gazing, I.e. veins which might appear as textures on organs, in order to differentiate from the Under-Earth.

John has reworked the navigation, so now we must rescale *all* the spaces/modes/realms (Thoms, Swamp, Landscape, Earth, Body) so that they are consistent, so that for example, no longer is the Under-Earth realm too large which was making the navigation too slow. Should feel like different *kinds* of space in earth and Body.

November 18, 1997 Lab notes:

Our working process is not laid out month by month in a series or linear progression of tasks; instead they are all happening *at once*.

November 25, 1997

We need an introductory scene for pre-calibration of the breathing at the beginning of each journey: a very painterly transparent-brushy version of Thorns, among which immersant could *drift*..

November 28, 1997 Lab notes:

Sounds: the Winter Swamp is still missing its main voice. The Winter Swamp's river sounds excellent, like a "murmuring" but only from a distance, not close. In the Interior Body/Earth, the sound is very good, almost done. Interior Body/Earth feels *wet* with various echoing, and various levels of beating and rhythms.

December 9, 1997

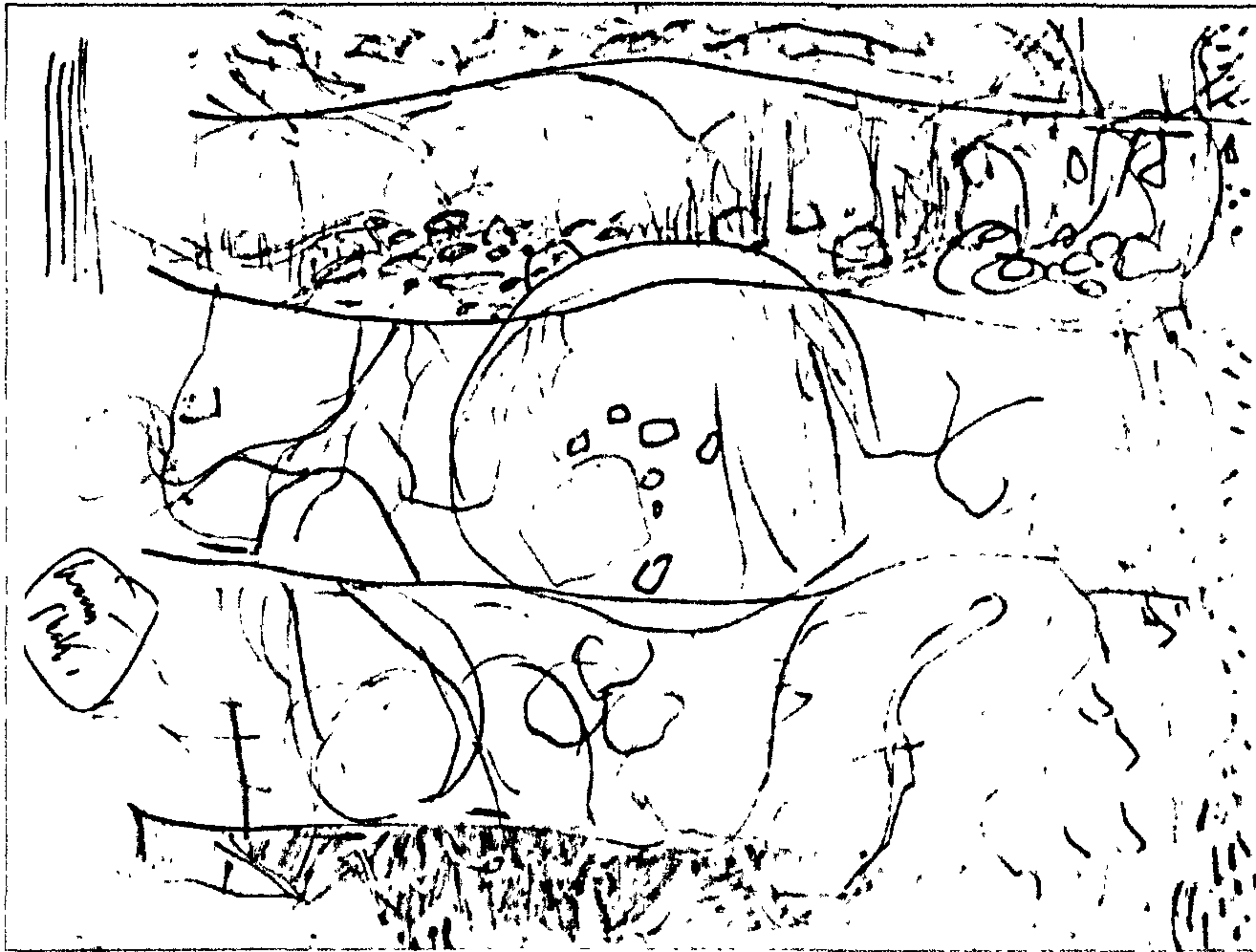
Winter Swamp: We have spent the major part of the autumn working on the Winter Swamp, where we tested all our principles. Describing this work in new language, conceptually and technically: not interactive but inter-responsive; not spatial but temporal; recurring elements; elements watching; interiority.

December 18, 1997

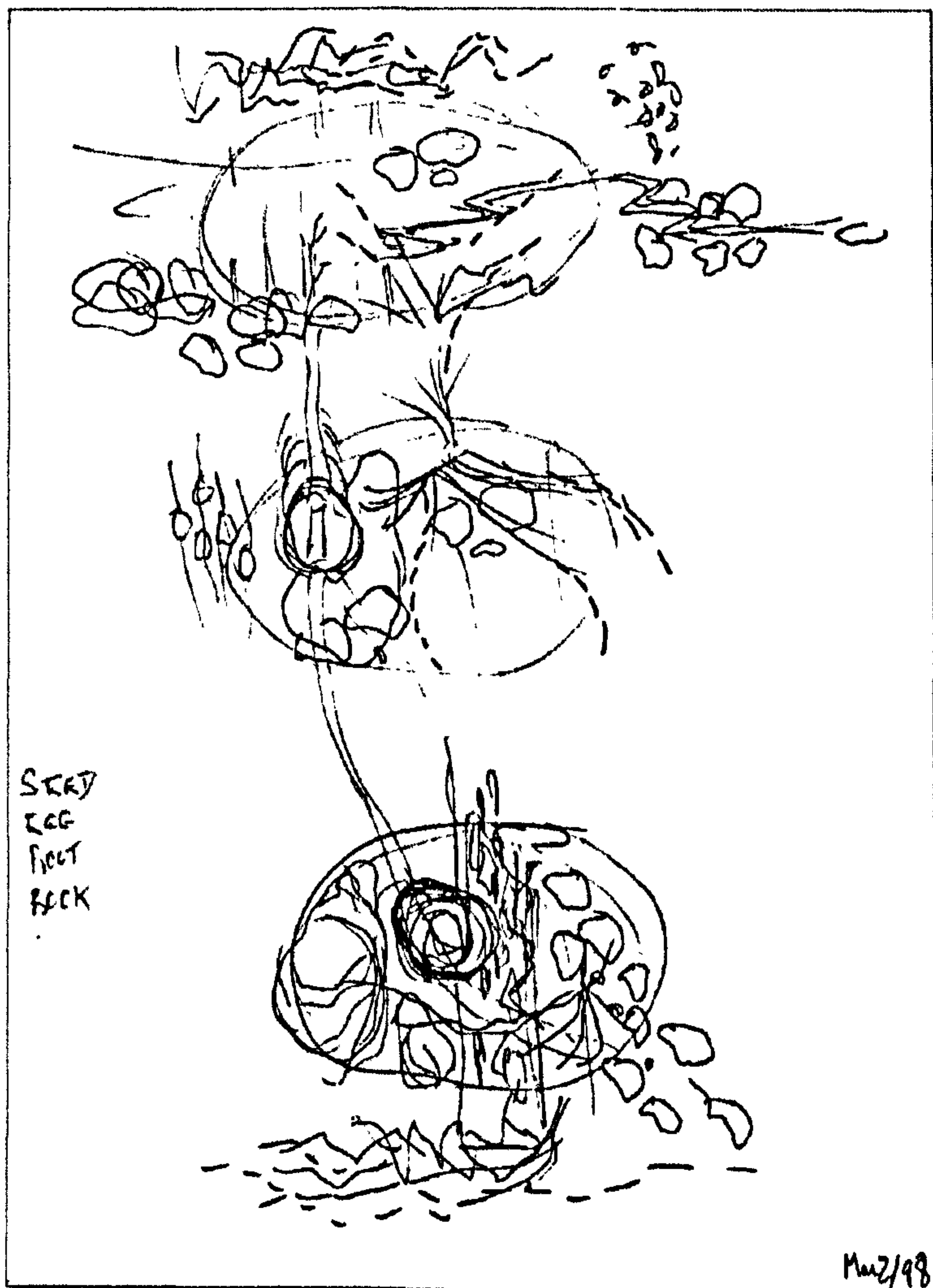
Comments during fly-throughs: There is so much work to do still.. My vision is *symphonic*, a gathering sense of what the work needs, watching now after not seeing it for a month, I now realize that in order to balance out Under-Earth + Interior Body, we need very *lush* earth or forest as Forest Landscape, not as only Interior Landscapes, but above ground also. It is such a monumental task to try to synthesize, integrate all these disparate parts into a whole. The same task as in painting, but on the scale, even more complex, of a feature film, but one that has no linearity and is completely responsive to the viewer, and also engulfs them spatially.

Ending: maybe the ending should be various elements, i.e. my recurring elements, turning into their own symbols. Maybe the beginning, before the Thorns come in, there should be symbols. *Thus a range of representations, from symbolic to allusion.....*

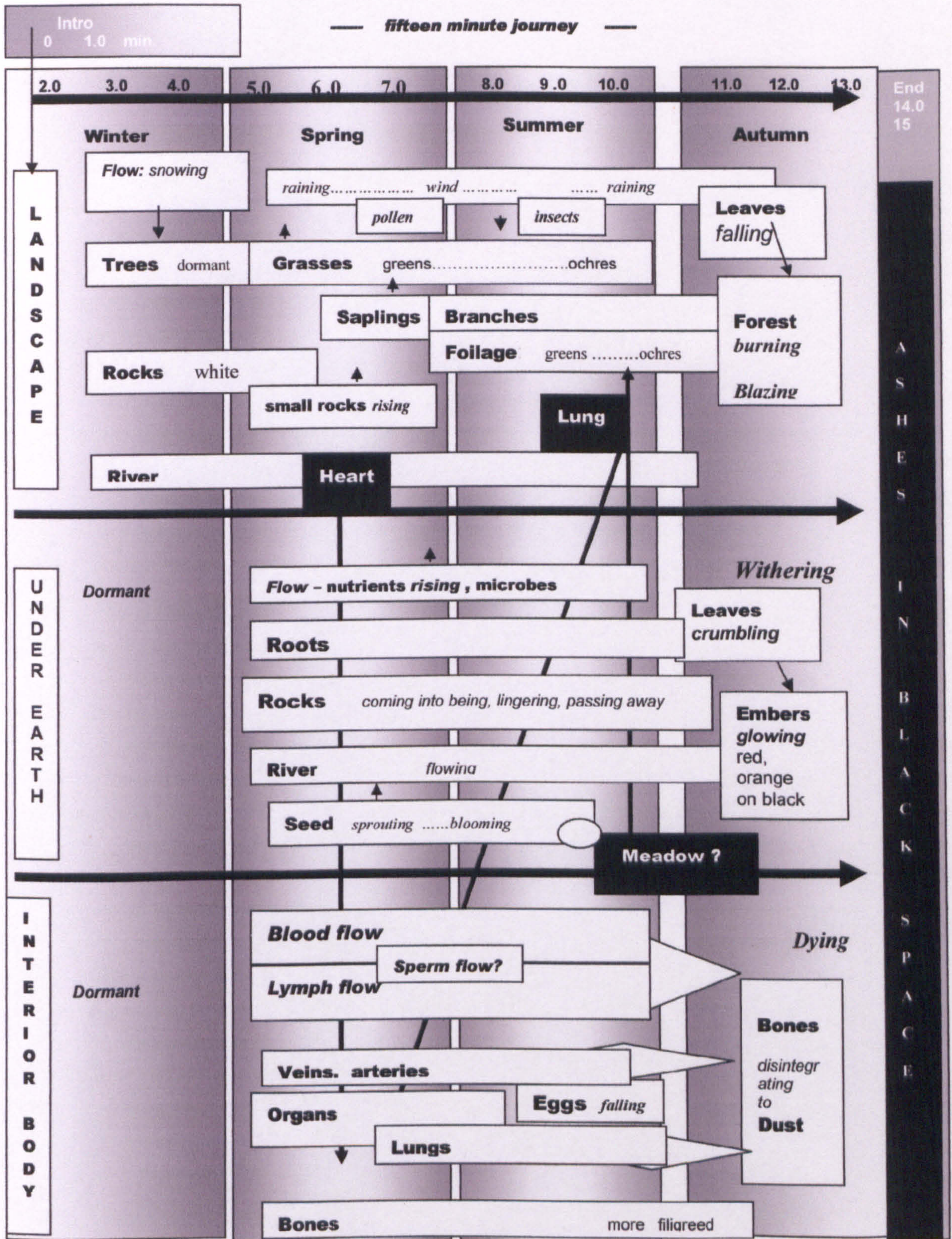
[Two-month suspension of the project.]




Spatio-temporal Realms of Ephémère: Forest Landscape, Under-Earth, and Interior Body
 Ephémère Working Notebooks, March, 1998



Spatio-temporal Realms of Ephémère (with Seeds, Eggs, Roots, Rocks)
 Ephémère Working Notebooks, March 2, 1998



March 25th, 1998

<u>Landscape</u>	Mar 25/98	<u>earth</u>	<u>body</u>
dead trees		rocks	organs 
rocks			
grasses - sm (dark)	↔	grasses (light as root hair)	?
grasses - lg (spring/summer)		?	side ways?!
black river		rock walls	bones
front edge		underground river	?
brown river		foliage texture - humus/rot	foliage texture - red violet
foliage		cracks + root hair	veiny texture
branches		moisture sinking down / nutrients rising	cellular debris falling
snow falling		nutrients/creatures	sperm? -
rain falling		creatures	cells
pollen falling/blowing		root flow	vein flow -
insects floating ^{birds darting}		falling leaves (ferrous, rotting)	
streaming flow (spring out)		seeds	eggs
falling leaves			
falling seeds			

Summary of Elements in Landscape, Under-Earth and Body
Ephémère Working Notebooks: Mar 25, 1998

<u>Landscape</u>	<u>Earth</u>	<u>Body</u>
dead trees		
rocks	rocks.....	organs
grasses (small, dark).....	grasses (light as root hair).....	?
grasses (spring /summer).....	?.....	side ways?
black river.....	?	?
forest edge (around swamp).....	rock walls.....	bones
brown river.....	underground river.....	?
foliage.....	foliage texture (brown violet).....	foliage (red violet)
branches	cracks in earth, root hairs.....	veiny texture
snow falling/rain falling.....	moisture sinking down.....	cell debris falling
	nutrients rising	
pollen falling/blowing.....	nutrients/creatures.....	sperm?
insects floating, birds darting.	subsoil creatures.....	cells
streaming sap flow (spring).....	root flow.....	vein flow
falling leaves.....	falling rotting leaves.....	?
falling seeds.....	seeds.....	eggs

Mar 2, 1998 Lab notes:

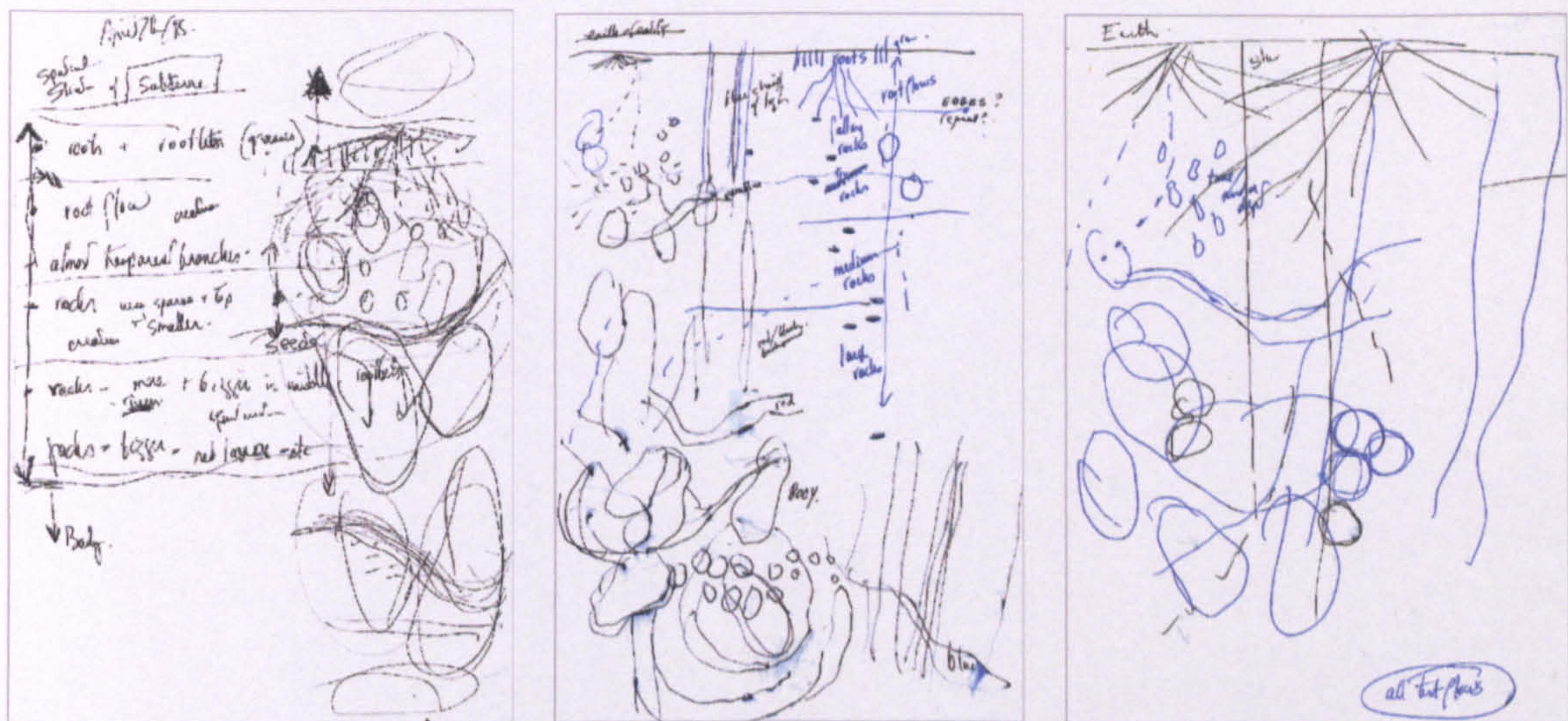
Under-Earth: add rain; brown sky texture should stay horizontal; more root flows (need to be able to reverse flow); add branches; more flecks (make more brown, green in the spring); more roots.

Trouble!!! We are now down to a frame rate of *six frames per second*.

[We needed to achieve a rendering frame rate of at least 20 to 30 frames per second so as to avoid "lag" in the helmet, i.e. the jerky effect if the immersant moves her head. This became an increasingly problematic and pressing issue as the work progressed. More and more time was spent dealing with this challenge, which ultimately necessitated removing many of the elements we had so carefully composed.]

April 1, 1998 Lab notes:

Start structuring the Under-Earth in *time*, from night to day to night to day (three cycles over a 15 minute immersive session). For now, since we cannot animate the parameters of the background colour, we use a single colour. **Problem:** Because many of the models are transparent, they are not being affected by changes in the light. When we temporally structure the Under-Earth, we also need to restructure it spatially, architecturally.



Spatial Stratification of Elements in Under-Earth (with Roots, Rocks and Boulders)
Ephémère Working Notebooks: April 7th, 1998

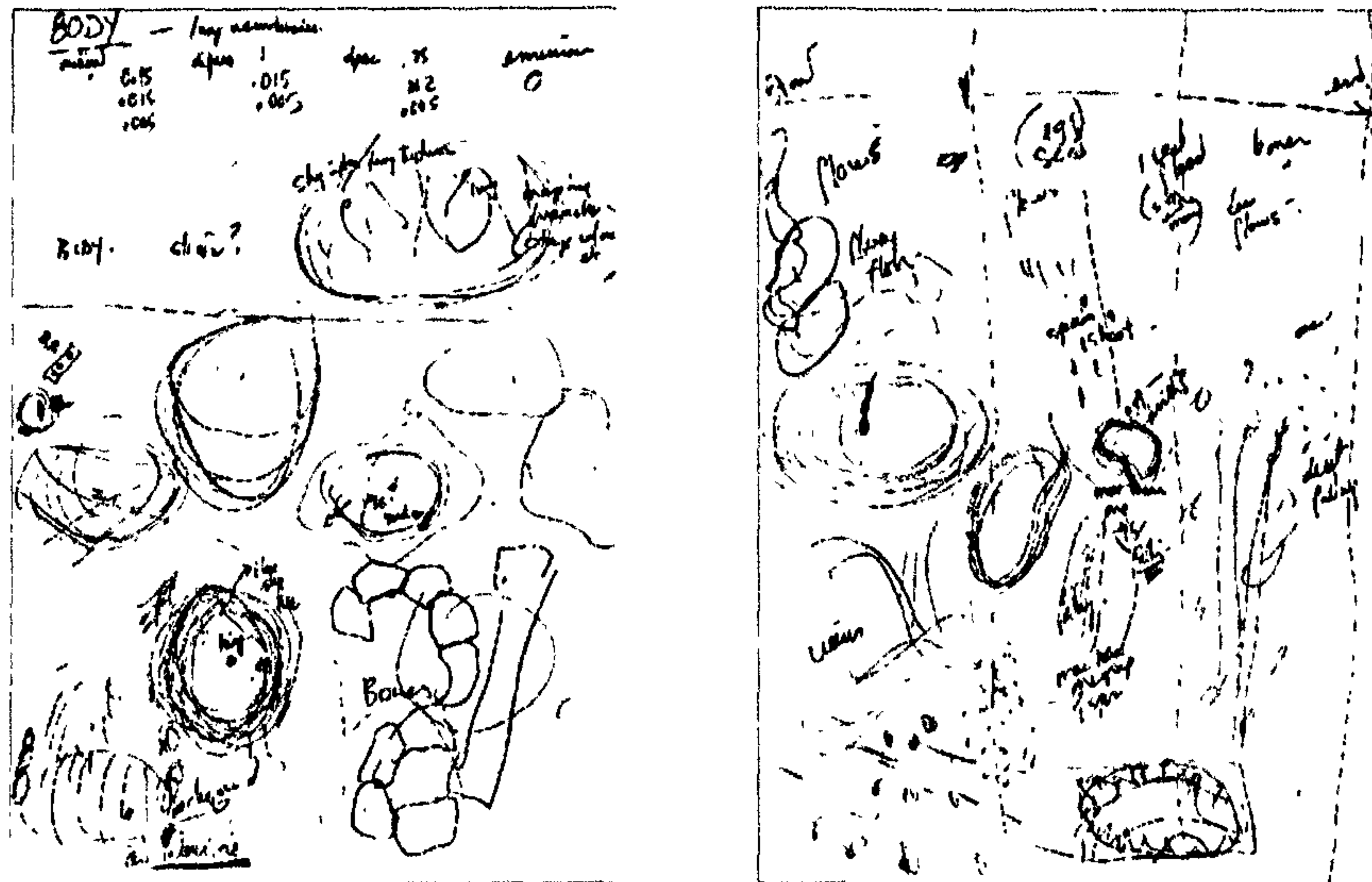
April 7th, 1998

Spatial strata of Under-Earth from the highest to the lowest level: roots and rootlets; root flow (and creatures); almost transparent branches; rocks, very sparse at top and smaller; Seeds; rocks, more, that are larger, with rootlets and the River element flows here; very large rocks/boulders – as the immersant goes deeper, these become organs in the Body.

April ?

Our purpose is not to illustrate, denote, or represent the idea, but to evoke emotions that might be associated with its poetic meaning. Interior Body: Many large eggs falling by. The Egg that Georges loaded has a mistake that makes all its keyframe rotations appear at once, creating a blinding white out. We will keep this...

[Originally, I had wanted to approach the Eggs In the Interior Body the same way we approached the Seeds in the under-Earth, as being responsive to the approach and gaze of the Immersant, so that the immersant's behaviour could initiate some kind of "opening", most likely related to fertility and new life. However due to lack of time, we did not pursue this. As a result, even though the Interior Body does contain Eggs - which rain down upon the Immersant - they are not responsive.]



Spatial Stratification and Temporal Evolution in Body (with Eggs, Organs and Bones)
Ephémère Working Notebooks, April 8th, 1998

April 14, 1998

John has begun putting in all the transitions, while Georges and I are still structuring.

My comments from In the HMD: need colour adjustment to helmet, and more contrast. Forest Landscape: fog should thicken and thin; bring the forest edge in sooner; try white grasses; following river through the foliage. Under-Earth is beginning to feel like a real space, with moonlight blue in the earth, falling leaves good against the blue, branches good, and looking up to see blue veins or roots above. If the Immersant goes up through the Thorns (as green), they become change to red as if neurons in the Interior Body; if one goes down through Thorns they seem like brambles can lead to? In the Forest Landscape: the River scales wider, bluer and smaller becomes mist; bloom (white) like Seeds like Eggs like ashes. We begin working on the timings, going through the work over and over, making adjustments.

April 23, 1998

Interactivity: Forest Landscape: if the immersant is in the River, then it becomes an Interior Body vein; if the Immersant is above River, then it becomes river passage; if the Immersant is in a Rock/Boulder, the Mountain-Interior Landscape (different landscapes for different seasons); if the Immersant looks towards the Sun (even if within the Interior Body), then everything becomes whitened out; if it is dusk, and the Immersant is relatively quiet and still, then creatures come; if the Immersant passes through a tree... then, trees fall.

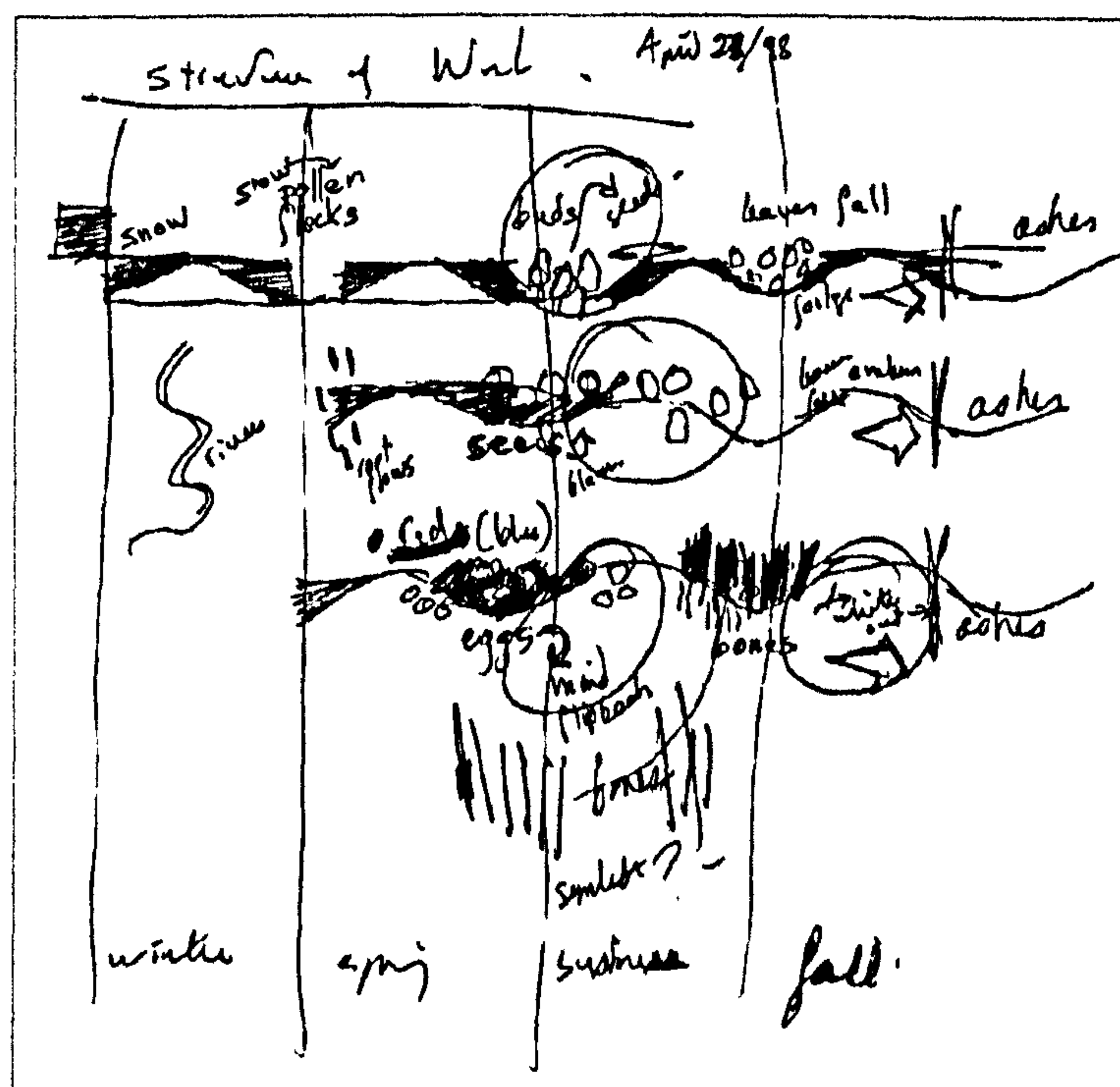
Work with concept of things becoming alive at a certain time, e.g. inactive to active rocks. When active, elements flicker.

Gaze: interaction includes: angle; proximity/distance; time passed; such "gazing" causes a scene to appear inside, and all around the immersant; meanwhile everything else fades out [additional details excluded]

Seed: "watches" the immersant; becomes "receptive" only if the immersant moves slowly; if the immersant is close to it and gazing at it during its "receptive" state, it will grow and do its seed thing. Georges and I go into the helmet to work with the two Interior Landscapes (appearing inside rocks, when gazed upon as described above).

[We planned to use these two interior landscapes - the Mountain Landscape and gray Arctic Landscape as described previously - as a visual mirage-like effect because I wanted to avoid the cliché of having the boulders function as portals into other full scenes. Thus, even though each landscape had been constructed as a fully enveloping spherical space, we did *not* want the immersant to move around inside them, but only to see/hear them from a single point of view of an encircling 360-degree horizon. Therefore our choice of the particular point-of-view from which the immersant would be able to see the landscape around them was important. To accomplish this we went into the helmet and floated through the two landscapes until we found what we believed to be the optimal point-of-view for the desired effect.

When these Interior Landscapes become "active" in response to the gaze of the immersant, they appear like visual "veils" over the scene/place/mode the immersant is already in. For example, the bleak gray Arctic Landscape would appear like an enveloping, semi-transparent veil, superimposed upon the already present Winter Swamp, etc.]

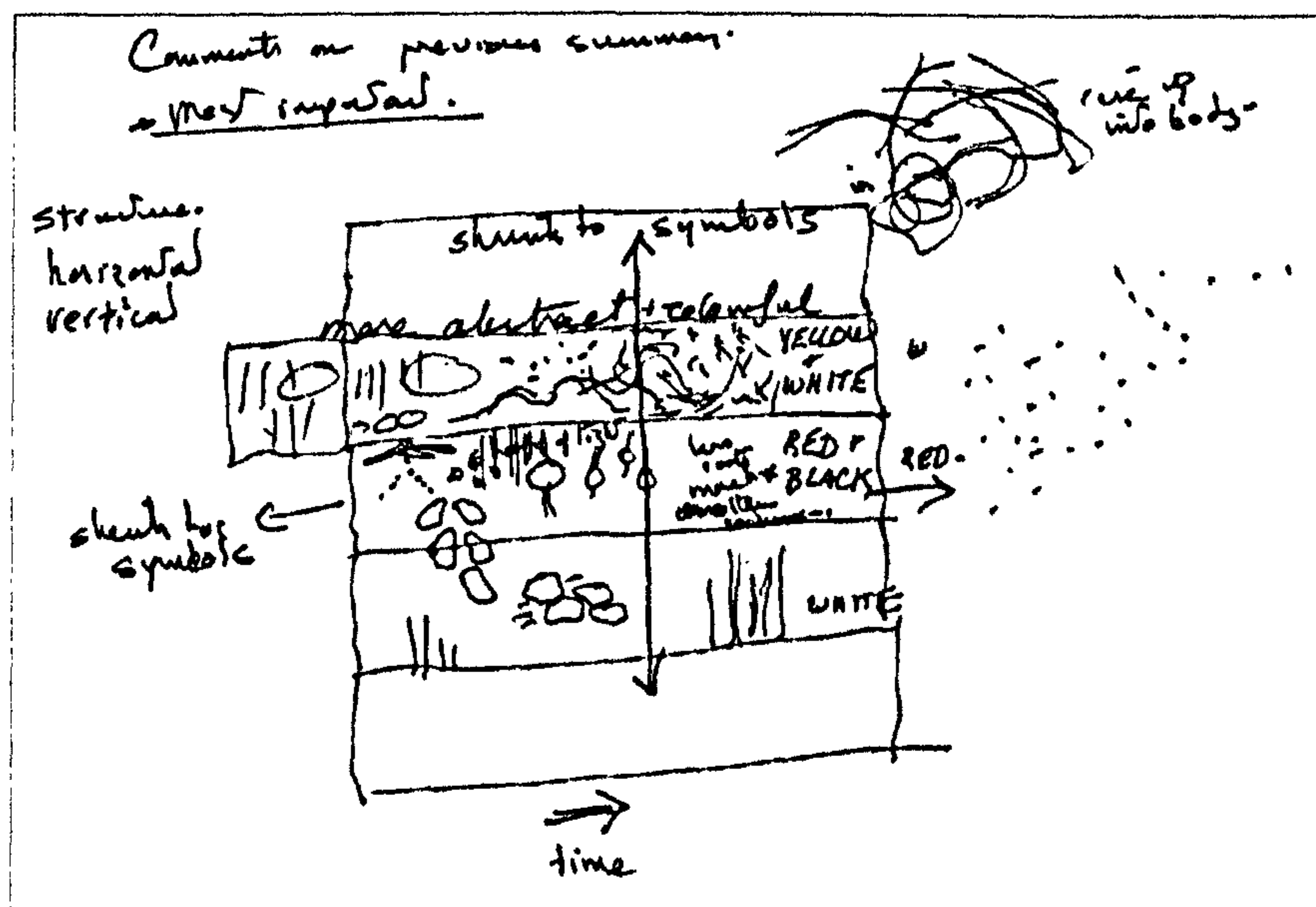


Structure of Work: Spatial Stratification & Temporal Evolution in Landscape, Under-Earth and Interior Body
Ephémère Working Notebooks, April 23rd, 1998

April 26, 1998

After re-reading the notebooks to help pull work together. Summary of Ideas, which we have not sufficiently pursued and need to revisit: *This work, like Osmose, is also constructed vertically; it is time that is horizontal.* If the Immersant goes to the edges of the work, would they end up in the Interior Body, surrounded by their sounds of breathing, or could retinal activity take over? Begin in chaos, have order and focus in the middle, the ending becomes decay and entropy. Spring into summer has a torrent of activity. During nighttime, must have more reliance on sound. **Ending:** Internal Body, retinal veil (blindness), returned to Under-Earth?

Forest Landscape and Under-Earth must be animated with non-human "centers-of-being", apparent only when the Immersant is still, or at night. In *Ephémère* all elements should swell, flux, flow, pulse. Pathways and tracks of animals through the Forest Landscape should be a kind of musical score. Duration, oscillation, pulsation. Structures are maintained by process. Immersant recycling through the Forest Landscape to Under-Earth to Interior Body and again etc. As the Immersant approaches Body organs, the body organs should sway more slowly in response. *Everywhere there should be flow, a flow passes through the work constantly.*



Conceptual Structure: Horizontal and Vertical
Ephémère Working Notebooks, April, 1998

April 28, 1998

Seed interactions: Seeds are only present in the under earth: In spring and summer, and when the Immersant is at a certain depth (or within a range of depth). Seeds only appear: In the middle range of the under earth, with the option that they will appear directly in front of the Immersant. Seeds will flicker when receptive, and will only be receptive if the Immersant moves slowly. Seed germination is triggered (need to find an alternative word to "trigger") by: the Immersant gazing toward the seed (i.e. it is within the field of view) from a certain proximity; after a certain amount of time passing; and a slow approach towards it. Seed will then bloom and go through its life cycle. When finished, the three-dimensional Seed will be cross-faded with a 2D texture map and fade away.

[When we were working with gaze as an interaction, we were not actually working with the immersant's gaze in terms of the direction their eyes were looking, or rather than general turn of their head, calculating this via the sensor embedded in the top of the helmet.]

April 30, 1998

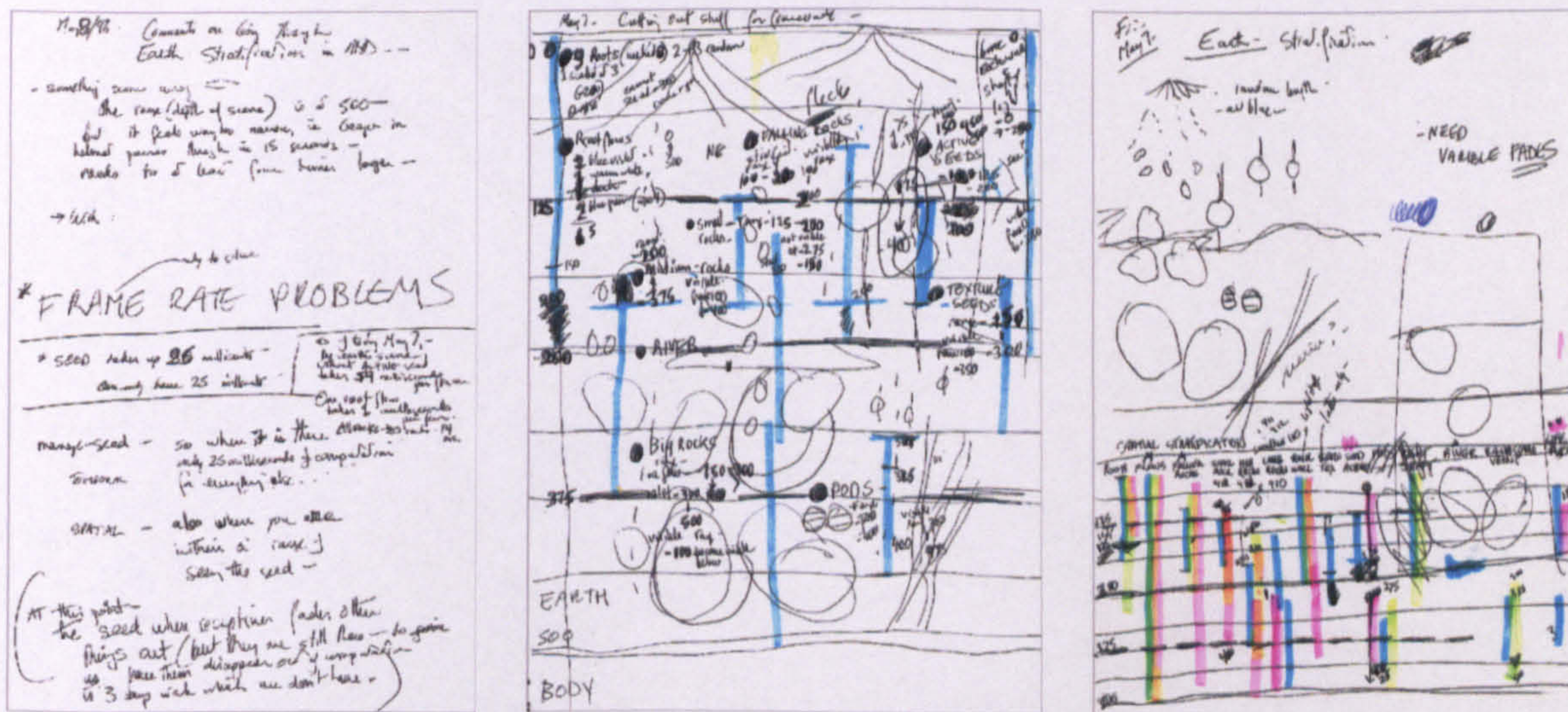
River interaction: Landscape "river sliver"; landscape river, blue river also aboveground; blue river underground; red river artery; blue river vein; shrinking river passage...

May 6, 1998

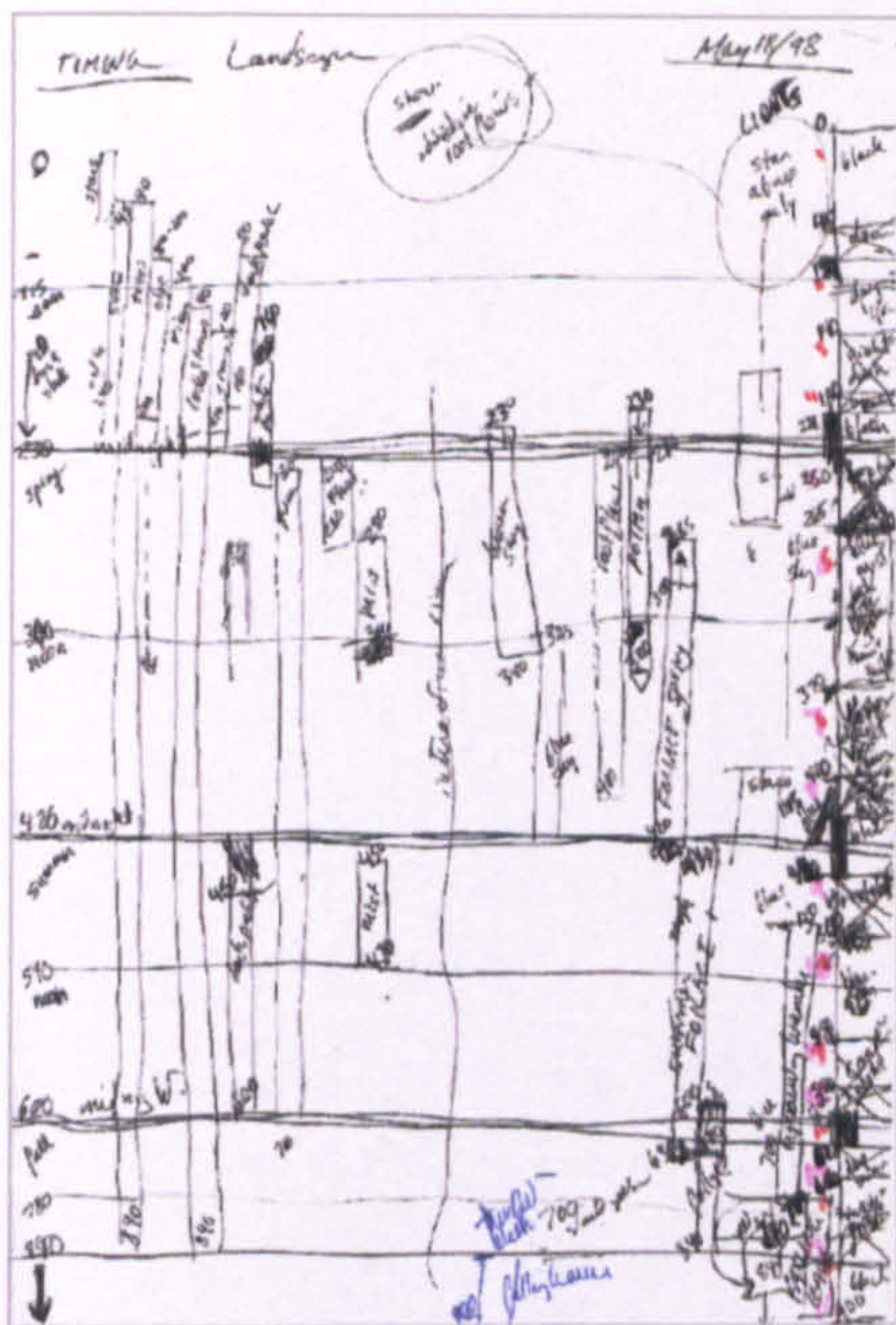
[Here the notes become too broken up to include. We began working on the *spatial stratification* of the various elements within each realm (Landscape, Earth, Body), planning the range of vertical depth within which elements would appear. Simultaneously we were working on the *timing* of each element's appearance in terms of when and how quickly it might "come into visibility"; how much visibility (i.e., what would its final amount of transparency/opacity be); how long it would linger; and then, when and how quickly it would "retreat from visibility", i.e., withdraw into non-visibility, within the 15 minute (900 second) session.

We also began dealing with a serious problem which we had been having for months, which was that of our frame rate. While the most optimal frame rate (frames rendered per second) is 60, 30 will suffice. By this I mean that even with a frame rate of 30, one can avoid the jerky lag effect that happens when a person in the helmet turns her head, and the visuals do not keep up). We, however, were dealing with frame rates down to 6 or 7 a second, even while using what was then a very fast computer (a SGI Infinite Reality II) which has five years later, been superseded by a PC.

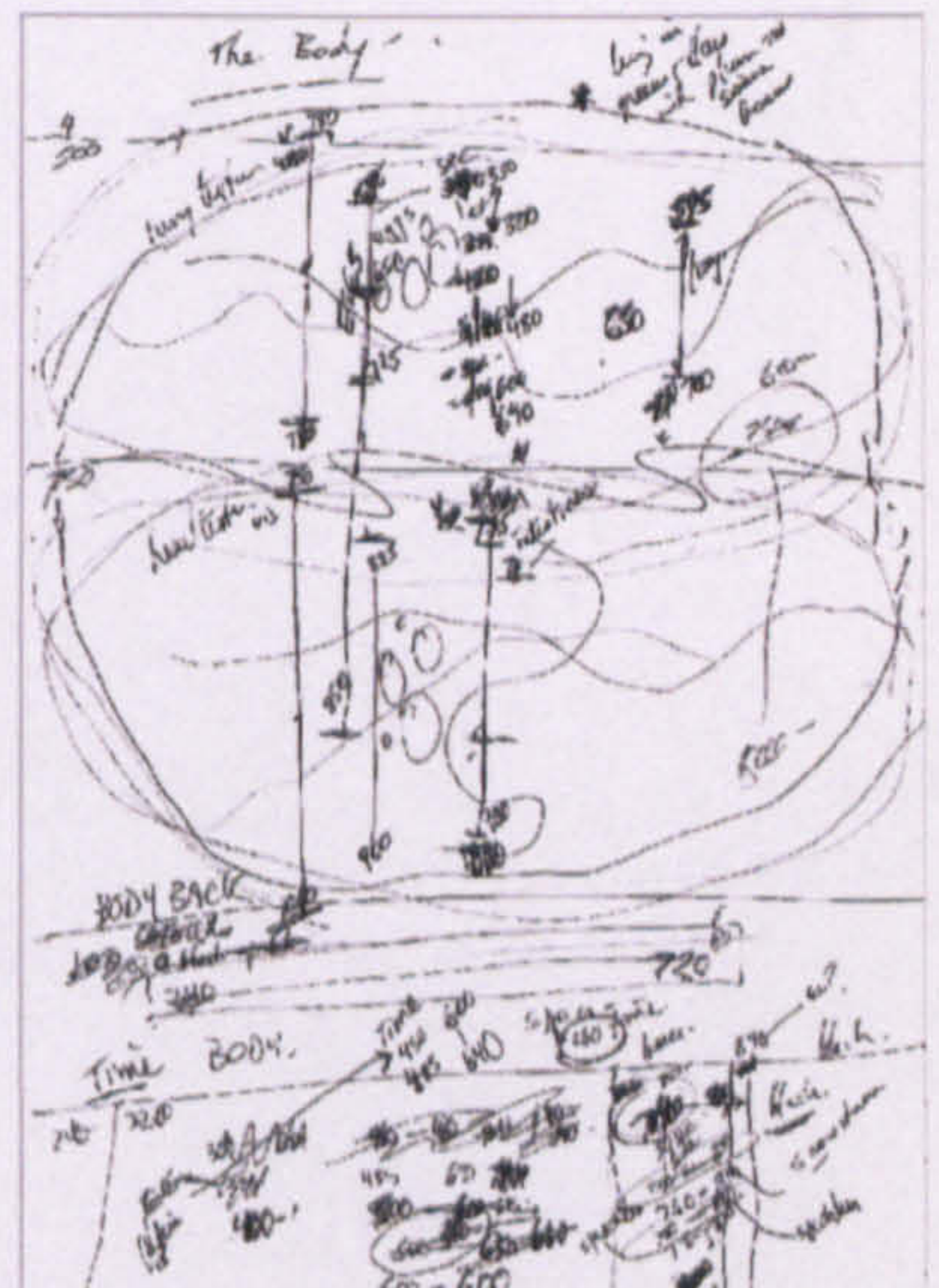
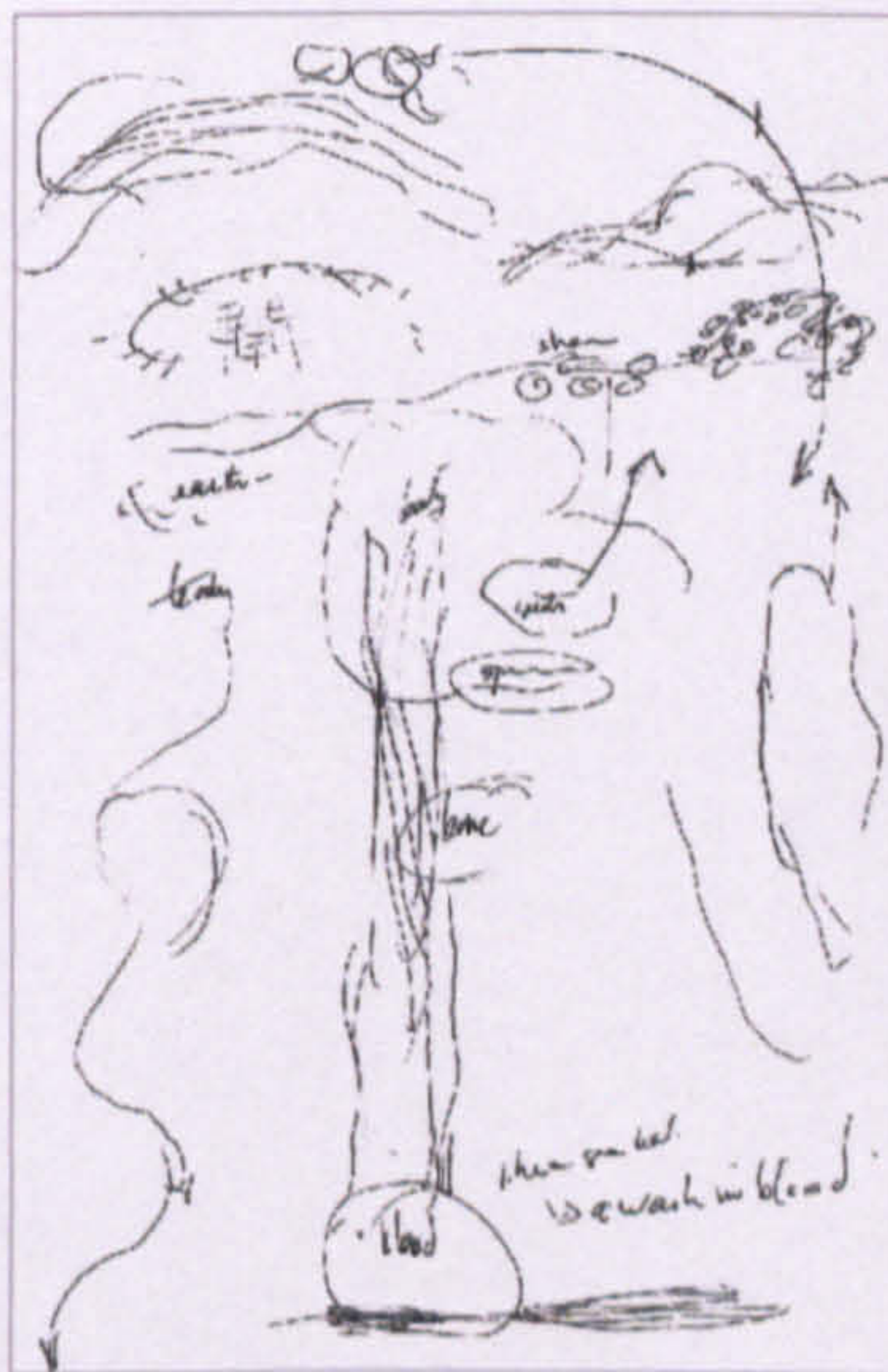
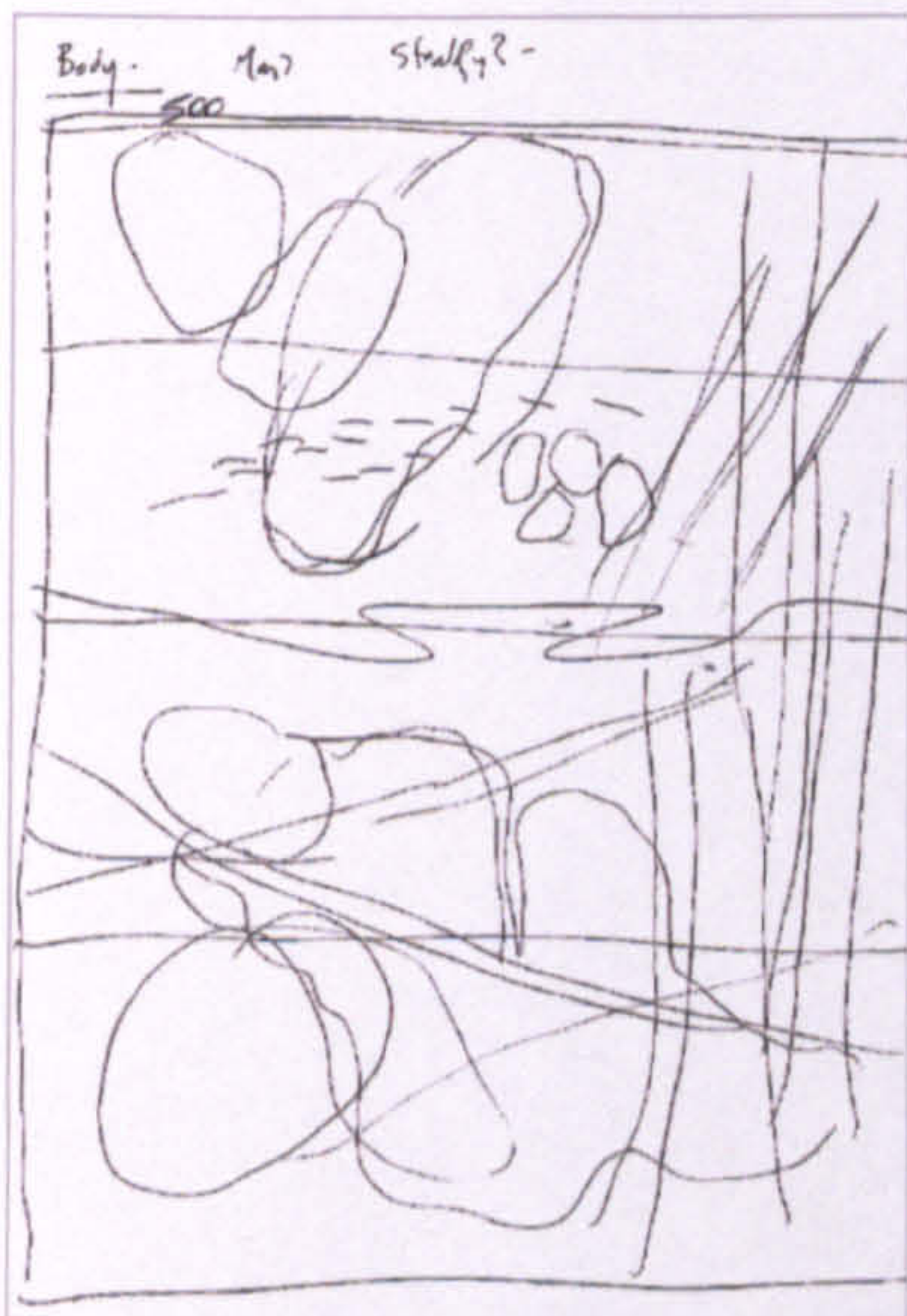
At the time, in spring 1998, we had no choice but to begin removing much of the complexity we had created, simplifying the elements, having less, and so on - in order to make the graphics "less heavy" and speed up the rendering to obtain a better frame rate. This process, of removing elements, then placing the elements back in because otherwise the effect was visually too paltry, was a back-and-forth activity that continued until the last night before the work's premiere in mid-June. The following charts are my working diagrams to help us keep track.]



Spatial Stratification of Elements in Earth: Frame rate problems/ Cutting Out Elements to Increase Frame Rate
Ephémère Working Notebooks, May 7th, 1998



Timings of Elements in Landscape; and Spatial Stratification of Elements in Earth
Ephémère Working Notebooks, May, 1998



Spatial Stratification & Timings of Elements in Body
Ephémère Working Notebooks, May, 1998

May 18th to June 15, 1998

[Notes continue to deal with detailed alterations as well as resuming work on the sound, but are very broken up so I will include only excerpts to illustrate our preoccupations at this point.]

June 2 -3 1998

Frame rate optimization for 15 minute (900 seconds) journey through Winter Swamp & Landscape: frame rate getting slower at 100 seconds into the journey; after removing half the trees, frame rate is better, i.e. faster, until 110 seconds in.

We have to remove the subtractive rocks keeping only the additive rocks.

We must remove half the rocks: with only half the trees and half the rocks, the frame rate is now 19 frames per second.

We must also remove all of the white rocks under the snow: frame rate is now better but drops at 130 seconds in...

So now we must remove the wind in the grass effect: this is not enough, so we must remove the wind throughout. As a result, at 200 seconds into the work (in Forest Landscape) all okay; at 230 seconds in however, frame rate slows down to an unacceptable 15 frames per second...

Therefore we must remove snow and subtractive rocks at 215 seconds in: as a result frame rate goes back up to 20. However at 240 seconds in, frame rate drops, because of landscape's river and foliage morphing...

We must therefore remove forest edge earlier, this raises frame rate back to 20. But, at 250 seconds in, frame rate drops again...

We must therefore remove swamp ground before landscape foliage comes in.

All my lovely overlaps have been removed because of the slowing frame rate.

All the visual complexity is being lost.

We must also remove 30 percent of the foliage and remove either the brown sky, flooded surface or blue sky as we cannot have all of them at same time. At 280 seconds in, frame rate slows again...

We must therefore remove half the trees. A third of the way through the journey, frame rate is back up to 20 frames per second, however at 420 seconds in, it slows again due to overlap of spring and summer foliage...

We need to optimize root flows. Between 420 and 240 seconds in, frame rate is down to 10 frames per second, then even slower, to 8...

We must remove the overlap of spring and summer foliage.

We also have to remove all the branches, because they cut the frame rate in half.

Therefore if we keep some branches in summer, we have to cut out the root flows. Using the non-morphing branches does not help, so we must have the branches come in later. At 560 seconds in, without branches, frame rate is OK.

Interactive River has to be cut out earlier.....

June 3, 1998

Frame rate optimization, and other changes, through Under-Earth: Add 8 more Interactive Seeds, for a total of 9.

Remove some of the non-interactive seed clusters; add a greater variety of colours in the rocks; add flat textures on flat horizontal planes;

Add slow flocks (unfortunately we can only have one, because it is too heavy on the computing); adjust root flows, make more visible (there was a bug so we couldn't see them).

We forgot to add in the river. New planar level needs to be more subtle.

Frame rate optimization, and other changes, through Interior Body: add roots as neurons; try adding falling snow/stars as sperm; add curved texture of horizon; add four planar horizontal levels of texture; rework organ colours; colour sideways river not red, but creamy yellow, and blue, more transparent;

recolour landscape veins; recolour interactive river, needs to be a deeper red; put brown sky back in; need more lung texture; need different textures on body organs.

June 4, 1998

Reworking colour again in the Interior Body to make it all come together: drop saturation of the blue in the Forest Landscape veins; flocks; add one root flow close to the Interior Body level; does heart texture extend below Interior Body? Alternate colours of layers; river comes in too high; add more thorns; extend roots below surface by 10 percent; add flecks in Interior Body.

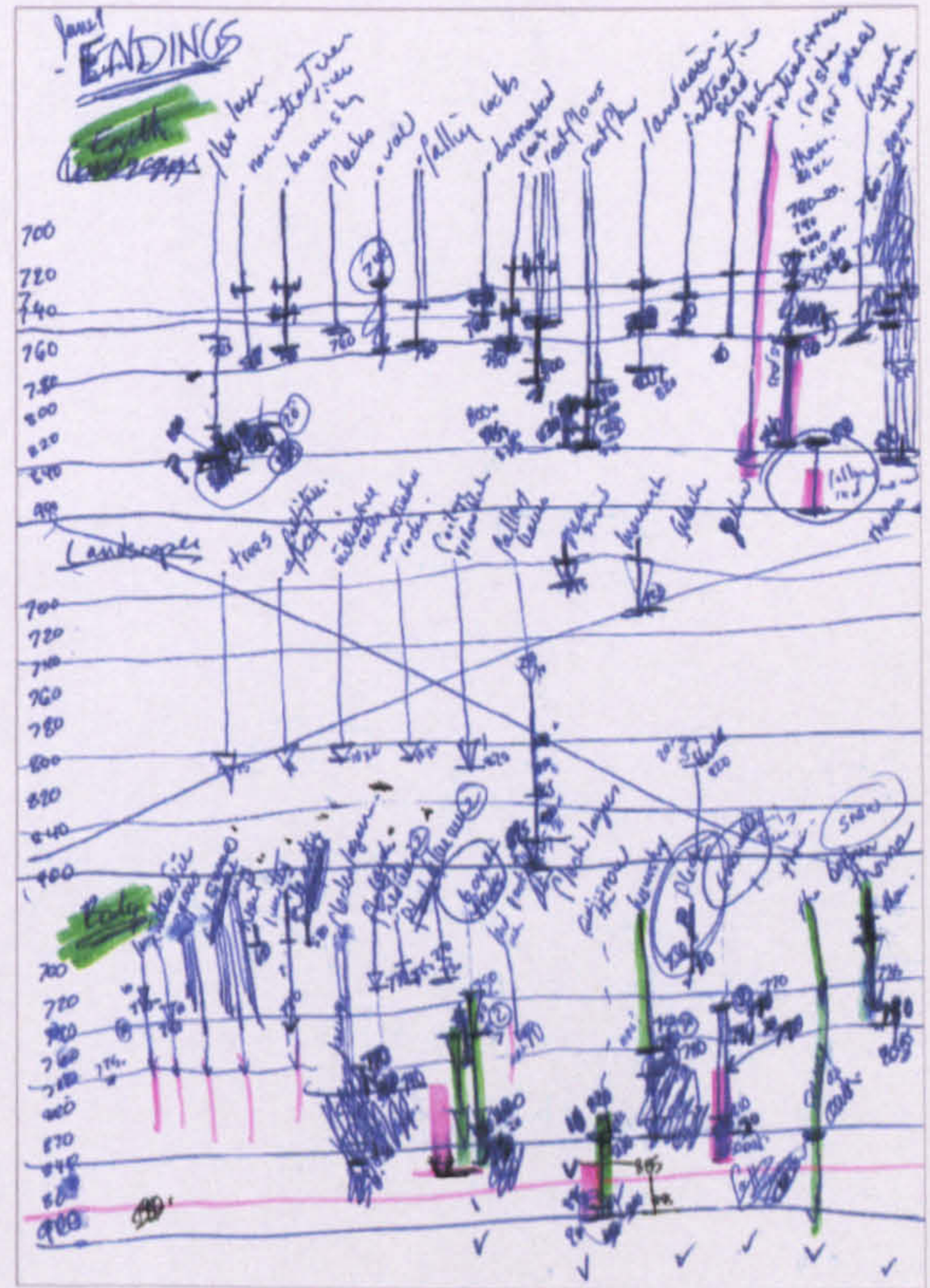
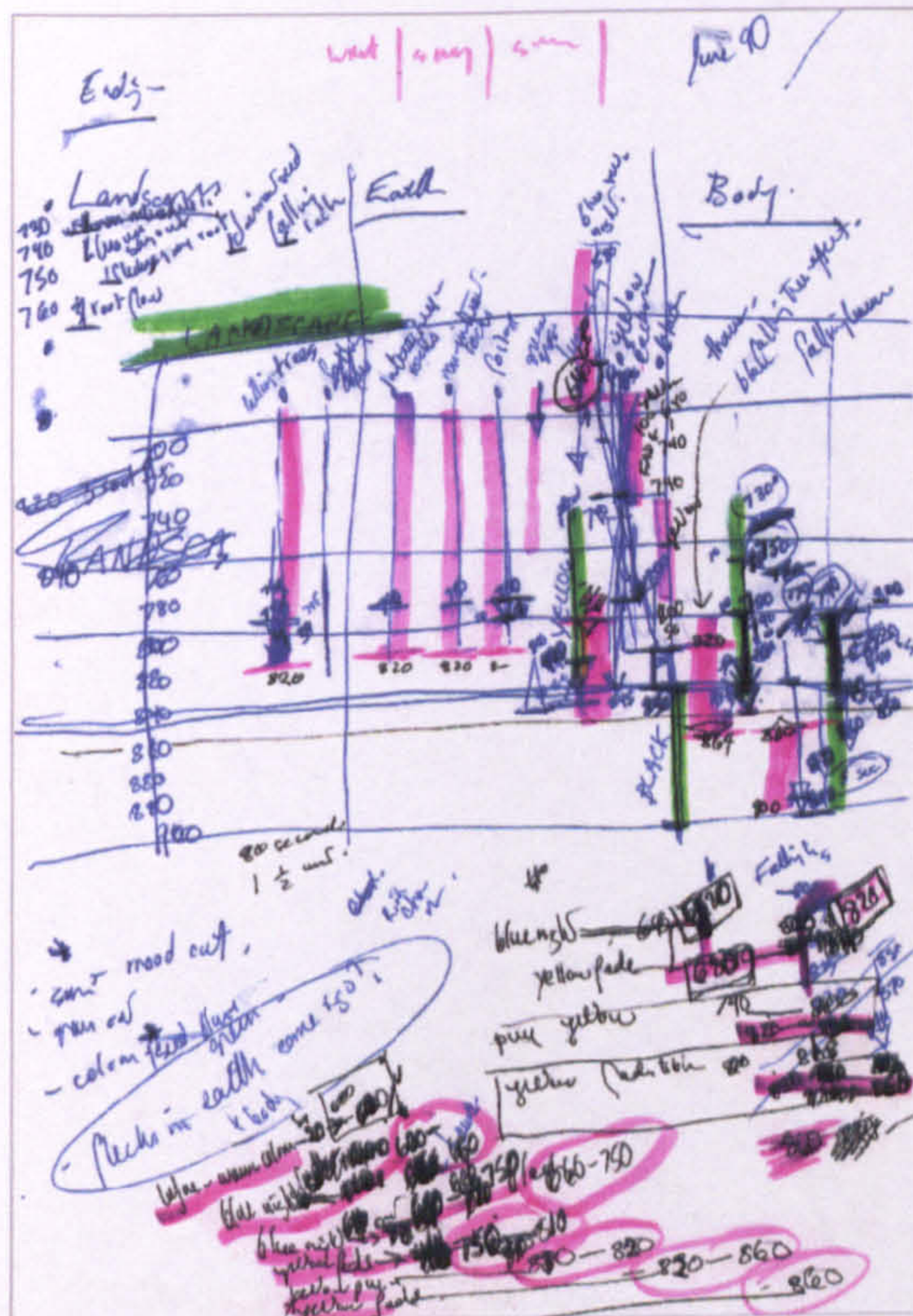
Working more on the ending: falling tree?

If in the Forest Landscape when the work is ending, then yellow leaves falling...

If in the Under-Earth, shafts of light and embers ...

If in the Interior Body, luminous bones...

And then ashes and ashes falling in empty black space...



Endings (Relative Spatial Stratification & Timing of Elements in Landscape, Under-Earth and Body at their Endings)
Ephémère Working Notebooks, June, 1998

[Notes about working on the ending are too broken up to include here]

2. The Completed Work

Ephémère consists of a fully-immersive virtual environment with stereoscopic 3D computer graphics and three-dimensionally spatialized sound; a stereoscopic HMD with a wide field-of-view and low resolution; and real-time motion tracking of breathing and balance, integrated with gaze and other interactive modalities such as proximity. Like *Osmose*, *Ephémère* was designed not only as a solitary immersive experience, but also as a performance-based installation with real-time visual and audio projection of the immersant's body. *Ephémère* runs on the same equipment as *Osmose*, with the exception being that *Ephémère's* sound runs on a PC instead of a Mac. While both works were originally programmed on a high-end Silicon Graphics computer, in spring 2001 we re-engineered their graphics to operate on Linux and PC technology.⁴²

Ephémère was completed in June 1998, with its premiere taking place at the National Gallery of Canada. At the time of *Ephémère's* first exhibition, we considered the work to be somewhat incomplete, in terms of what I had originally envisioned. If circumstances had permitted, we would all have liked to have worked on it for at least another six months, if not a year. This was impossible, however, because the ending of my formal relationship with Softimage caused the team to be disbanded (though several years later, John Harrison joined up with me again to reengineer both works for the PC). Also, I do not believe in revisiting and changing a work after it has been presented to the public: Instead, I prefer to consider the work as yet one more step towards realizing my longer term vision, and going on to make another work where the last one left off.

Nevertheless, even if we did not achieve all our goals, we did accomplish significant progress. *Ephémère* reiterates and extends *Osmose* in many ways: Both works utilize semi-transparency and ambiguity in the visuals, incorporating an approach developed previously through painting, but which in *Ephémère* is expanded to include significantly more abstraction. While both works share a user interface based on breath and balance, *Ephémère* introduces gaze (combined with bodily proximity and so on) as a means of evoking response from certain sensitive elements. The two works also share interactive three-dimensionally spatialized sound.

Content-wise, the various spatial realms and symbolic elements of *Osmose* reappear in various guises in *Ephémère*: for example, the *Osmose* clearing is revisited in *Ephémère* as its timed-based prologue, a winter swamp in ebbing twilight with falling ghost trees and boulders containing interior landscapes. Similarly, *Osmose's* forest becomes *Ephémère's* forest-landscape, a swiftly-changing realm engaged in seasonal progression; and *Osmose's* subterranean realm becomes *Ephémère's* under-earth with its drifting boulders and germinating seeds. While *Osmose's* parenthetical realms of text and code are absent, *Ephémère* contains, at its "bottom", the translucent tissues, pulsing organs, flowing bloodstreams and luminous bones of the interior body.

Most importantly, *Ephémère* effectively introduces the notion of flux and transformation, introducing a temporal dimension that was mostly missing from *Osmose*. While *Osmose* does contain particle flows as well as diurnal/nocturnal cyclings in the Clearing which affect its lighting and melody – and there is, as I have explained earlier, a variability in the visual field caused by the

⁴² It took *eight* years, i.e. from 1994 to 2001, for PC graphic computing power to increase enough to render our many levels of semi-transparency in real-time, i.e. at a frame rate sufficiently fast enough to provide an effective experience of immersion and interaction.

In its final form, *Ephémère* is structured spatially on a vertical axis, with three primary horizontal levels: Forest Landscape, Under-Earth, and Interior Body. The Interior Body functions as the substrate of the work, “under” the fecund earth and the lush bloomings and witherings of the land. (There is also a fourth, transitional realm, of Thorns/Neurons, situated in the depths of the Interior Body and above the Forest, cyclically linking body with landscape on a vertical axis.) Most importantly, even as the Immersant floats among all these realms in *Ephémère*, no realm remains the same: The Forest Landscape changes continually, passing through cycles of day and night, and also transforming seasonally, beginning in the gray light of a winter twilight (in the Winter Swamp) and cycling through spring and summer to the brilliantly-hued climax and decay of a Canadian autumn. And within the Under-Earth, at certain depths flotillas of watchful Seeds appear; while deeper down, within the pulsing sloshing Interior Body, eggs fall and aging organs give way to bone. There is also the River which manifests on all three levels. Finally, there are three different endings in *Ephémère*, depending on where the Immersant is at the end of her time in the work – and in all of them, ultimately, are embers or ashes, falling like dust.

ENTRY:	<u>WINTER SWAMP</u> (prologue)	<u>SPRING</u> >>>	<u>SUMMER</u> >>>	<u>AUTUMN</u> >>>	ENDING
Level I	Forest Landscape:	river, boulders, foliage leafing	>	falling trees & leaves	> embers & ash
Level II	Under-Earth:	stream, boulders, seeds germinating	>	decay	> embers & ash
Level III	Interior Body:	arteries, organs, eggs falling	>	bones (aging)	> embers & ash

Transition Thorns/Neurons

River/ underground stream/ bloodstream: flowing on all three levels

Spatio-temporal Structure of *Ephémère*

Meanwhile, through the duration of the immersive experience, the various elements have been choreographed to subtly emerge into being, i.e., come into presence (both visibly and audibly), linger and then pass away. The various timings of their individual appearances and withdrawals are dependent on two aspects: on the temporal progression of the work from its beginning to its endings; and on the Immersant’s spatial location, particularly vertical depth, as well as the Immersant’s proximity, slowness of movement, and duration of gaze. (I will discuss our use of gaze as focused attention in the next chapter.) Such transformations and interactions are not only visual but aural: While the visual elements pass through varying states between full transparency and near opacity – and in the case of the Forest Landscape, progress over time from the recognizable to the more abstract – the sound is also in a state of flux. *Ephémère* is thus a *temporal* space, where every aspect – including parameters of light, atmospheric fog, colour, visual form, sound, and relations between Immersant and environment – has been choreographed to engage in constant transformation, in an unceasing ebb and flow, wax and wane of visibility and audibility, over an extended duration of time. (The specific duration of 15 minutes per session was chosen as optimal for enabling Immersants to experience and respond to the work, while permitting an adequate number of Immersants to pass through the work daily during public exhibitions.)

In this context, with its emphasis on the temporal unfolding and intermingling of visual and aural elements, *Ephémère* could, perhaps, be thought of as “operatic”: But – and this is crucial –

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not one whereby the audience is on the outside passively watching and listening in, but rather, where the immersant is at its centre, *bodily-surrounded and actively involved*. Thus, *not* a work whose narrative is linear and predetermined, but one which is interactive and open-ended, for *Ephémère* consists of a complex repertoire of elements whose recurrings and recombings are dependent upon the spatio-temporal context of each other *and* the behaviour of the participant immersed within. In comparison, *Osmose* is a more simple and static space whereby the drama is derived primarily from the immersant's passage and changing point-of-view: And, whereas in *Osmose* the immersant can maintain a cognitive map of its spatial realms and return to them at will, in the more abstract and continually transforming *Ephémère* there is no stability, there is nothing to conceptually hold onto, and the immersant has no choice but to surrender to its flux and be swept away.

Visuals and sounds

The visual vocabulary of *Ephémère* is comprised of a full repertoire of the elements that have recurred in my work for 30 years. As listed previously, these include the skeletal trees and boulders in the Winter Swamp, the lush foliage and river in the Forest Landscape, various enveloping landscapes in ovoid-spheres (the interior landscapes inside the boulders), subterranean roots and rocks in the Under-Earth, as well as germinating seeds and buds engaged in blooming. In *Ephémère*, these elements, many of which were present in one form or another in *Osmose* (with the exception of seeds and blooming), have now been extended to include the realm of "interior body", including translucent body tissues, flowing bloodstreams, luminous bone, and floating veils of retinal flecks. By combining both elemental groupings, it was my intention to suggest a metaphorical correspondence or co-equivalency between the chthonic presences of the interior flesh body and subterranean earth.

Behaviours of certain elements have been developed to watchfully respond to the immersant's behaviour, including her gaze or rather "focused attention", as well as her proximity and slowness of movement. If, for example, the immersant approaches and directs her gaze towards a Seed in the earth, in response (for it is also "aware" of the immersant) it will "open" and begin to bloom, enabling the immersant to enter within its transformations. Similarly, if steadily approached and gazed upon, Boulders will respond by "opening" to conjure up Interior Landscapes which envelop the immersant briefly as mirage-like veils before fading. (The use of gaze as a means of interaction will be discussed in the next chapter.) There is also a responsive River, which will, if gazed upon and entered, gravitationally *pull* the immersant into its flow: If the immersant allows herself to be passively carried along by the river for a certain length of time, it will, in response, randomly transform into one of its corresponding renditions, as an underground stream or bloodstream, delivering the immersant into one of the other spatial realms: this strategy serves to provide an alternative, non-linear means of navigation in addition to the use of breath and balance.

As in *Osmose*, the sounds in *Ephémère* take place in real-time, are responsive to both the immersant and the environment, and localized in three dimensions. Similar to *Osmose*, *Ephémère's* sounds have an ambiguous quality, with their sources (from musical instruments, natural recordings, or digital) deliberately disguised. (My earliest ideas for the sounds in *Ephémère* are

contained in a detailed email to the sound team of Feb. 10, 1997, which is included in the previous *Ephémère* working notes.) Not being a musician, I described the sounds I “envisioned” in poetic terms, such as “a cacophony of the world incarnate, ‘presencing’ between the thresholds of birth and death, yet for each thing, each element, these thresholds are situated at different points in time and space ... so there is a constant flux, of syncopated, varied but enmeshed rhythms, of comings into being and of passings away, all of this manifesting as a myriad of aural streams in flux and flow”.

In the final work, sounds are not only associated with various elements such as boulders and trees, but also with the Immersant, who is accompanied by her own fluid “body sound” which in turn is connected to transformations in the environment itself, such as the volume of the wind. Additionally, as the Immersant becomes more attentive to her environment, she will not only see, but hear more: for example, some elements “call out” to attract attention when she passes by; others, such as the sun and moon, if gazed upon, make the sounds around more reverberant; and a boulder, if approached and gazed upon for a certain amount of time, will, as Dorota has phrased it, begin to tell its “story”, causing an aural and visual landscape (what I have earlier called an “Interior Landscape”) to temporarily envelop the Immersant – as a metaphor for the perceptual transformation that can take place when one is immersed in attentive contemplation. (A detailed description of *Ephémère*'s sound, written by Dorota Blaszcak and Rick Bidlack at my request in 2002, is included in the Appendix.)

An Immersive experience

To immerse oneself in *Ephémère*, the Immersant must don specific gear, just as in *Osmose*. As I have already explained, we use the same user interface in both works (although the breathing mechanism has since been optimized, as I will explain in the next chapter). Thus, to experience *Ephémère*, the Immersant wears a stereoscopic HMD with a wide field-of-view and audio headphones, and an interface vest which tracks her breathing and balance. Accordingly, to navigate within the work, all she needs to do is breathe – breathing in to rise and out to fall – and shift her centre of balance in order to change direction (or bend her knees to change speed). *Ephémère* also incorporates gaze as a means of interaction with certain “sensitive” elements (as mentioned above, and discussed in greater detail in Chapter VI), which responsively “open” to allow the Immersant to briefly enter into their spacious realms.

During the immersive experience, the Immersant feels totally spatially-encompassed (i.e., 360x360-degrees, not only horizontally as in a panorama, but also above and below as if inside a spherical space) by visual and aural elements engaged in constant transformation, all in response to her location, proximity and so on, and temporal passage within the work. Furthermore, even though Immersants are loosely attached to various cables and remain standing in one place, they rarely feel physically confined – because the interface, involving as it does deep breathing and a shifting of balance, enables a body experience that is very similar to performing Tai Chi.

In the following pages, I am going to describe a 15 minute immersive experience of *Ephémère*. But first, a caveat: being immersive, *Ephémère*, like *Osmose* before it, is a *bodily* experiential work. In this sense, even though it is an artificial construct, *Ephémère* is thus perceived as a sensorially-enveloping, spatio-temporal *place* that one can bodily be *within*. Every Immersive

experience is unique, unrepeatable, because it is dependent on the Immersant's own behaviour, on her whim or will: including the desire to calmly focus one's attention (those who speed around miss out on a lot); the intuitive or sometimes deliberate control of breath and balance (including one's natural physical propensity to sink or rise); and on physical agility in terms of being able to hover, or turn around to look behind while bending one's knees to alter speed, and so on. While the various visual/aural elements themselves have been constructed and made available for each spatial realm beforehand during production of the work, *these elements are generated, reconfigured and displayed in limitless recombinations, in real-time, according to the participant's behaviour and the temporal unfolding of the work.*

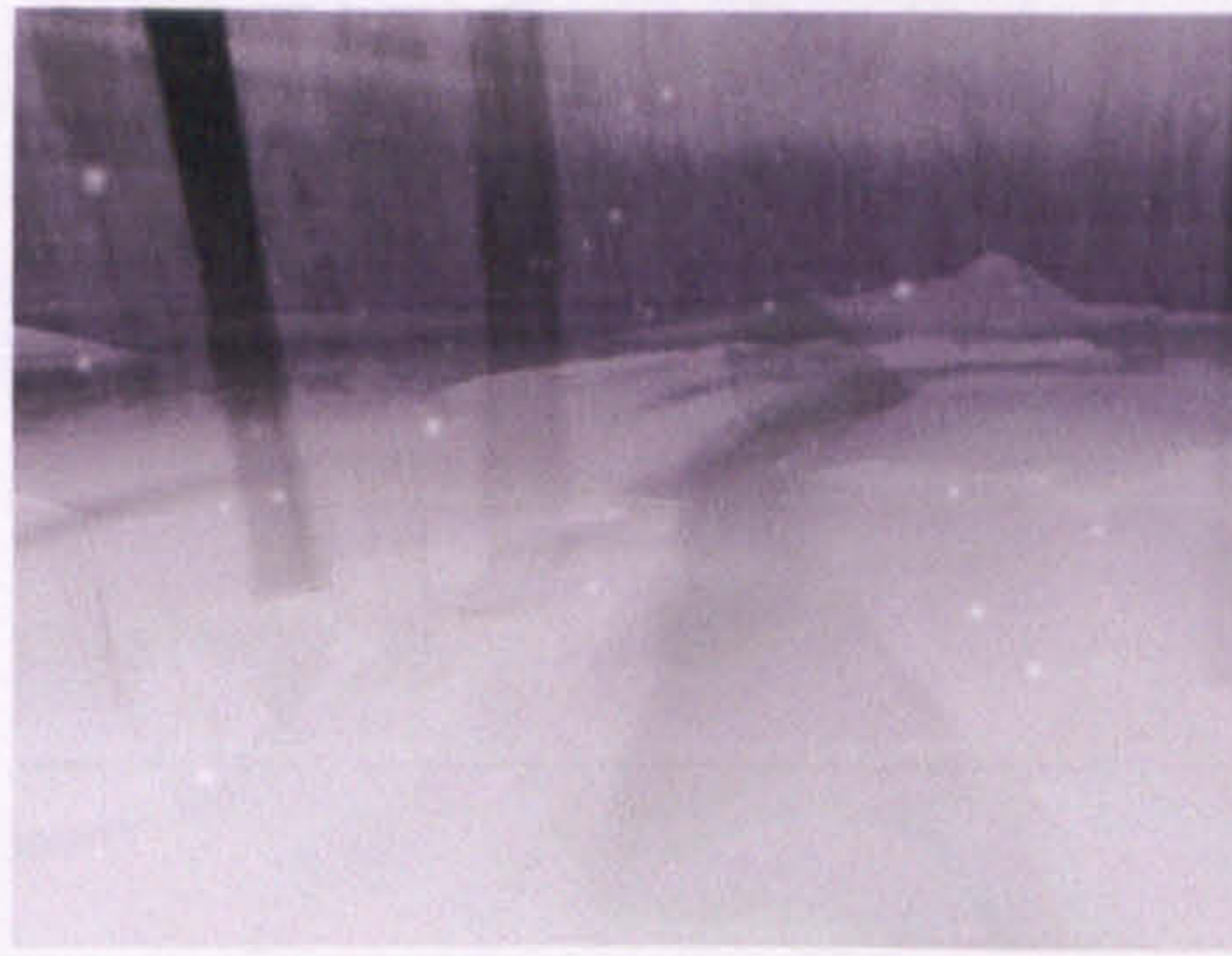
Such a work, therefore, does not contain a predetermined linear narrative or even a selection of narratives, as is the case with laser disc technology or CDs and DVDs. There are no "routes" for immersants to follow, or even a range of choices to be decided upon: Rather, each immersive experience is created by each participant's unique navigation within the space, and the space's visual and aural responses to such explorations. Thus *Ephémère* itself is always different, depending on individual who is bodily within it. As a result, even though I have watched countless journeys performed by many people, *Ephémère* continues to surprise me, as participants experience/create sights and sounds I have never seen or heard before.

More than anything, *Ephémère* is like an interactive "opera" with its myriad of lively visual and aural elements, all coming and going in different ways in response to the Immersant at its centre: Or perhaps, even more suitable as a metaphor, *Ephémère* is like a delicately responsive and immaterial *landscape* whose encircling horizon ever expands, as the Immersant roams within it, going here and there, engaged in contemplative reverie. In Chapter II, I quoted Anne Spirn who writes that landscapes must be *performed* to be experienced, that is, they must be experienced *in situ* to be fully known:⁴³ Similarly, an immersive virtual environment such as *Ephémère* is, albeit paradoxically, like landscape, because even for all its virtuality (and accordingly, its lack of living beings and material "thereness"), it can effectively be experienced as *place*. Accordingly, there are limitless trajectories through this work: in the following pages, I shall make up just one.

Prologue / Winter Swamp: When an Immersant first enters *Ephémère*, she will find herself floating among a large number of star-like points of light in empty black space. This brief introduction was designed to allow a few moments for the attendant to calibrate the Immersant's breath and balance, and also provide the Immersant with an opportunity to become accustomed to the interface in terms of looking through the helmet, and breathing in to rise and out to descend.

After a few moments, the points of starlight begin to fall, falling all around the Immersant like flakes of snow. At the same time, the pitch blackness gives way to a thick gray fog, which over the course of the next few minutes transforms from a violet gray twilight to the darkness of night. Meanwhile, all around the Immersant are sounds of wind blowing and rattling, knocking wood. If the Immersant looks down, below her body, she will see dark elongated strokes stretching vertically towards her. Upon exhaling, the Immersant may descend and drift among them, realizing that they are trees whose branchless trunks suggest they are but relics, no longer living.

⁴³ Anne Spirn, *The Language of Landscape*, 81.



Semi-transparent trees in the Winter Swamp, Ephémère
Digital image of 3-D virtual environment captured in real-time through HMD, 1998

In this realm of Winter Swamp, everything is semi-transparent and all is shades of gray rather than colour. Here, unlike the *Osmose* Clearing with its spatially-anchoring tree to which immersants could repeatedly return, no place remains the same: Every element is engaged in a constant process of transformation, in terms of coming into appearance, lingering, and passing away, both visibly and aurally. It is almost as if the immersant has floated down into a ghostly realm, actively engaged in its own processes of becoming and un-becoming. Enveloped in ebbing light and falling snow, the immersant can explore if she so desires. If, for example, she floats towards a barren Tree and deliberately or even mistakenly passes *through* its semi-transparent trunk, in response she will hear a distant cry like ripping wood as an almost transparent ghostly-white Tree (the *Osmose* tree in cameo) slowly falls and crashes before her. If she passes through other Trees, this Ghost Tree falls again, and again.



River and grasses in the Winter Swamp, Ephémère
Digital image of 3-D virtual environment captured in real-time through HMD, 1998

By now the immersant may have heard rushing sounds (behind her or perhaps beyond the Trees) of a dark and swiftly flowing river, which contains bright particles streaming within it. It is possible to follow this river towards the edges of the Winter Swamp, but not to leave it yet, because the semi-transparent skeletal Trees, each accompanied by its own rattling and knocking sound, constantly reconfigure themselves around her. There are other elements here as well, including wild grasses which tremble in the wind as the immersant moves by.

Most noticeably, the Trees are surrounded by the semi-transparent and ovoid-spherical forms of Rocks and Boulders. These, like everything else in the swamp, are constantly engaged in coming-into-appearance and disappearing, each one at a different rhythm between an entire range of transparency and visibility, and each issuing forth a deep base booming sound. If the immersant

slowly approaches one of these semi-transparent Boulders and steadily gazes at it from a tactful distance (before it inevitably disappears), it may respond to her presence by "opening" and summoning in a phantom visual and aural landscape.



Interior Landscape (Arctic) Appearing inside Boulder in the Winter Swamp, Ephémère
Digital image of 3-D virtual environment captured in real-time through HMD, 1998

This Interior Landscape, appearing first *inside* the Boulder as a blue gray, semi-abstract and amoeba-like shape, quickly expands until it completely envelops her, as a semi-transparent veil superimposed over the environment she is already in. For a few moments she can look about, seeing its encircling horizon of Arctic-like bergs of ice and snow, along with its accompanying sounds. After a few moments, this phantom landscape fades away, leaving her where she was, in the Winter Swamp.⁴⁴



Twilight in the Winter Swamp, Ephémère
Digital image of 3-D virtual environment captured in real-time through HMD, 1998

Meanwhile, as the immersant is floating through the Trees and Boulders (all of which are engaged in coming into being and passing away), the ambient light gradually transforms, becoming darker and more violet as dusk ebbs into night. Conceptualized as the prologue to *Ephémère*, the realm of Winter Swamp has been "choreographed" to last several minutes: Accordingly, the immersant is not allowed to leave it until a certain amount of time has passed. For example, if the immersant exhales with the intention of dropping below the semi-transparent ground (as was possible in *Osmose*), she will find it is "frozen" and she cannot descend; similarly, if she attempts to exit horizontally by moving towards the gray perimeter of trees that surround the swamp, she will find the perimeter remains beyond her reach, as more Trees and Boulders continually surround her. However, once night has come and eases into dawn, she is free to leave, or stay.

⁴⁴ This phantom landscape strangely prefigured my first real experience of the Arctic three years later (2001) on a sandbar surrounded by the ice-strewn Beaufort Sea where the wide curving horizon consisted of pale mirages of snow and ice.

Level I: Forest Landscape: If the immersant chooses to remain where she is, she will soon discover that everything around her has transformed. It is now early morning, during spring, and she is surrounded by a Forest Landscape. This realm is much more abstract and spatially ambiguous than the previous, and is characterized by intermingling semi-transparent layers of various greens, as well as vertical flows of luminous particles. These, along with the more familiar Trees and Boulders, are also engaged in various rhythms of emerging and withdrawing, appearing and disappearing, all the while reconfiguring around the immersant as she floats among them.

Meanwhile, the entire realm itself is transforming, irrepressibly engaged in seasonal progression from the pale green and blues of springtime to the denser greens of summer and eventually, the climatic siennas and ochers of autumn decay. This progression takes place over 900 seconds (i.e., the 15 minutes of an immersive session) without heed for the immersant, much like the various living elements in an actual landscape are compelled to engage in their own precise processes of becoming, regardless of whether we are present.



Spring in the Forest Landscape, Ephémère



Summer in the Forest Landscape, I, Ephémère



Summer in the Forest Landscape, II, Ephémère



Autumn in the Forest Landscape, Ephémère



Autumn in the Forest Landscape II, Ephémère
Digital images of 3-D virtual environment captured in real-time through HMD, 1998

Here, in the Forest Landscape, the Boulders are also “sensitive” to the immersant’s behaviour, and if approached in a certain way with slow and steady gaze, will responsively “open”, revealing an Interior Landscape within. This landscape, of smooth-sloped brown mountains and accompanying sounds, instantly expands to surround the immersant like a semi-transparent veil, and then, almost before the immersant can realize where she is, fades away.⁴⁵



Interior Landscape (Brown Mountain) appearing in a Boulder in the Forest Landscape, Ephémère
Digital image of 3-D virtual environment captured in real-time through HMD, 1998

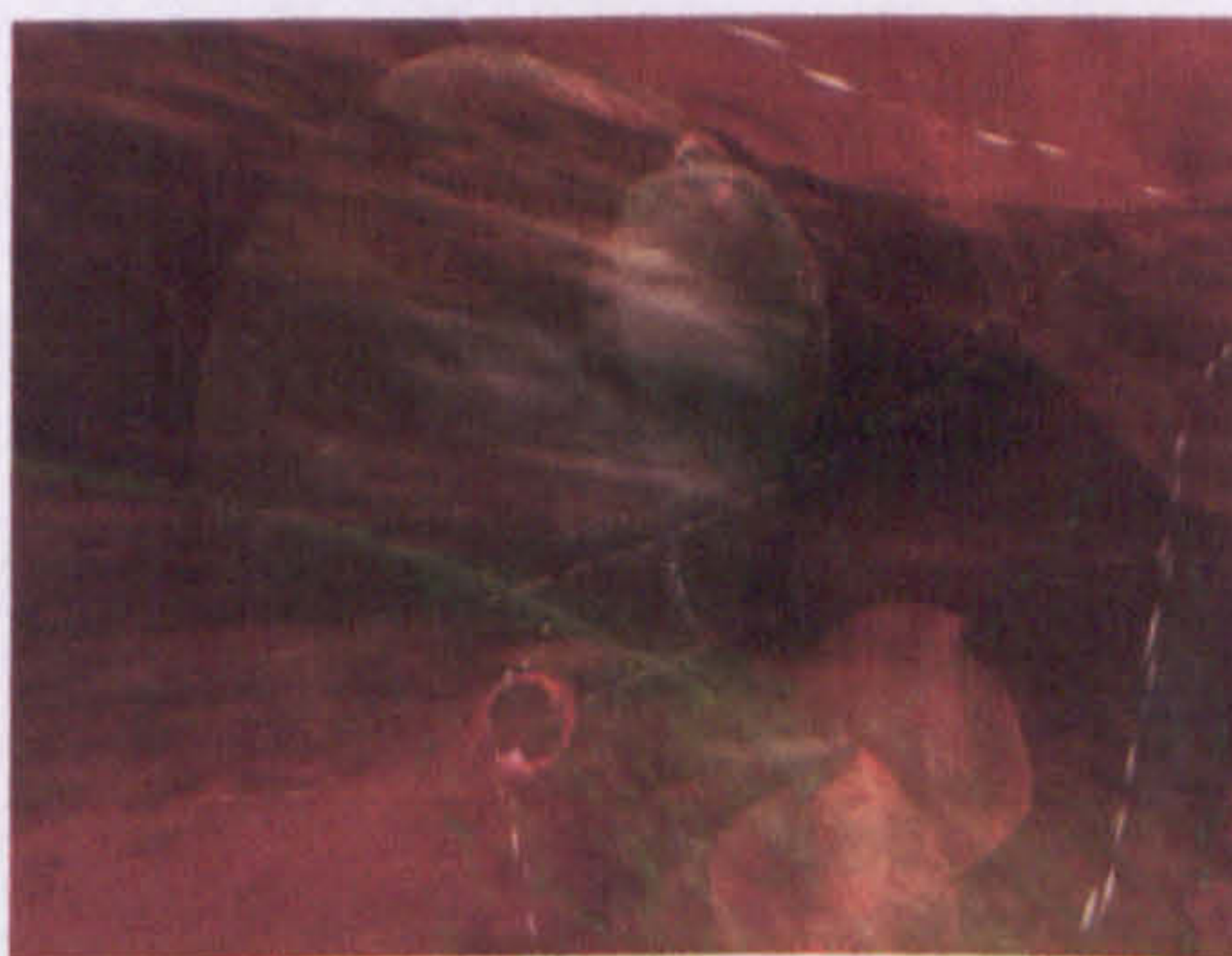
There is also a River in the Forest Landscape, swiftly flowing and making considerable noise. If the immersant finds it and surrenders to its gravitational pull, she will be sucked into it and effortlessly carried along as it rushes throughout the forest. If she stays within this River for a length of time, it will randomly transform into one of its symbolic counterparts, either underground stream or bloodstream (each with its corresponding sounds) along with their spatio-temporal contexts of Under-Earth or Interior Body. In this way, the River offers a non-linear way of navigating through the work. The immersant can choose to spend her entire 15 minute journey within the Forest Landscape, or leave it (via the River, or by breathing in to ascend, or out to descend) only to return later if she so desires. If she does return, she will discover that in her absence, the landscape has progressed over time, transforming through summer to autumn.

Level II: Under-Earth: If the immersant exhales deeply, she can descend vertically through the semi-transparent ground, past the spreading roots of trees, into a vast Under-Earth. Here she will hear deep rumbling sounds of shifting rock, as seemingly gigantic boulders drift, and slowly appear

⁴⁵ This phantom landscape, of a vast river valley and brown hills seen from a bird’s-eye view, inexplicably prefigured yet another place I experienced in 2001 – the extremely isolated Mackenzie Mountains wilderness in Canada’s Northwest Territories. Needless to say, it was a strange feeling to “recognize” the Arctic horizon and the Mackenzie River valley, from having unknowingly constructed an uncannily similar *virtual* version of them several years before

and disappear. The comings and goings of these rocks have all been choreographed, some in groups, some individually, at different depths of stratification. They are richly hued in ochers and siennas, and like everything else are semi-transparent. As in *Osmose*, the immersant is able to see through them and float through them as well, with the ensuing changing spatial relationships between the various semi-transparent layers generating abstraction and ambiguity. As the immersant floats among this realm, she will also pass through various veils of coloured flecks, and numerous vertical streamings of luminous particles.

If the immersant looks down, she may see the River element below, manifested here as an underground stream, a luminously flowing green ribbon suspended in space, issuing its own distinctive wet and echoing sounds. If immersant approaches close, its gravitational pull will seize her as did the forest's River, and carry her along, while summoning in either the Forest Landscape or the Interior Body realm below. Perhaps she will surrender (for it takes bodily effort and skill to move away from its pull) and find herself randomly back in the Forest Landscape, its various abstractions now engaged in the lushness of summer.



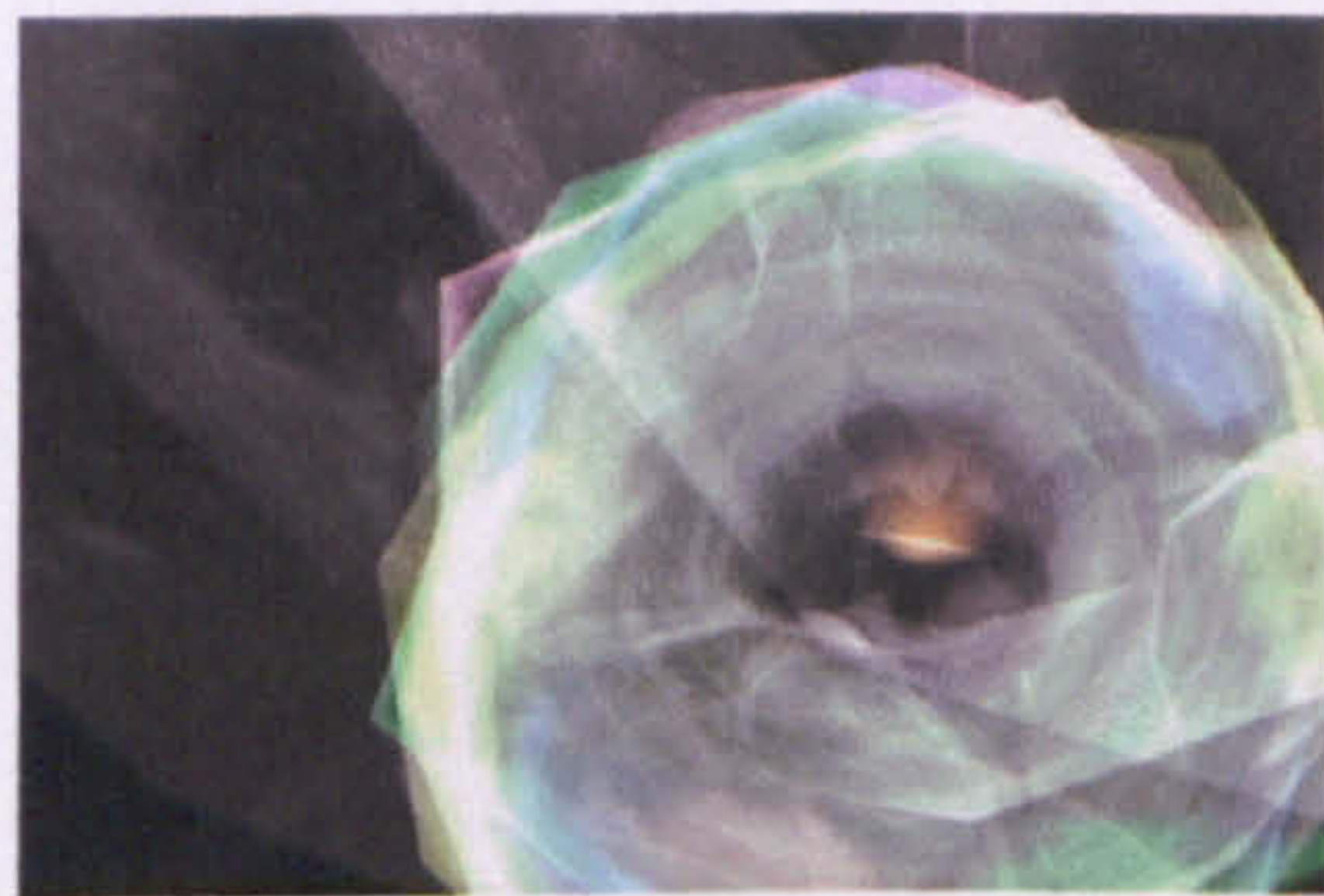
Rock or Boulder with Particle Streams and Flickering Seed in the Under-Earth, Ephémère
Digital image of 3-D virtual environment captured in real-time through HMD, 1998

The immersant may, however, choose to remain longer in the Under-Earth, seeking the responsive Seeds. Suspended at certain depths among the boulders, and appearing at only certain times within the temporal progression of the work, at first glance, these elements of seeds resemble large boulders. However, if the immersant is attentive, she will notice that some of what appear to be boulders have subtle horizontal stripes, and are ovoid-spherical or pod-like in shape. These are the Seeds, which, like the other elements in *Ephémère*, are visibly and audibly engaged in coming into being, lingering and passing away. They are also "watching" the immersant.



Germinating Seeds in the Under-Earth, Ephémère
Digital image of 3-D virtual environment captured in real-time through HMD, 1998

If the immersant directs her attention towards a Seed, and gazes at it from a certain distance, the Seed will begin to flicker in acknowledgment that it has "sensed" her presence, and will begin to "open". If the immersant is sufficiently skilled, she can approach the Seed (controlling her breath and balance, and bending her knees to increase speed). If she reaches it before it completes its germination and withdraws into invisibility, she can enter inside to experience its luminous blooming. Once enveloped *within* its translucent and shimmering veils, she can hear the tinkling sounds associated with its transformation, and look down to see its single root extending into the depths, or up to see its tendril-shoot extending above as if seeking light. After the Seed has climaxed, it will fade away and she will find herself alone again in the subterranean realm.



Blooming Seed in the Under-Earth, I, Ephémère



Blooming Seed in the Under-Earth, II, Ephémère



Blooming Seed in the Under-Earth, III, Ephémère



Blooming Seed in the Under-Earth, IV, Ephémère

Digital images of 3-D virtual environment captured in real-time through HMD, 1998

Some immersants never notice the Seeds because they are traveling too quickly through the work; others see them but do not pause long enough to initiate their germination. Some immersants deliberately seek out the Seeds (returning to the Under-Earth over and over again to do so), finding one seed after another, which they attentively approach, in order to enter their luminous interiors and experience their blooming.

Level III: Interior Body: Below the Under-Earth is yet another realm, the Interior Body, intended to suggest the internal pulsing frothing rhythms, aural and visual, of a subjectively-inhabited flesh body engaged in its own processes of living (referring not only to the immersant's body, but to *all* living bodies, including nonhumans). This realm has been placed at the "bottom" of *Ephémère* to function metaphorically as the work's substrate or foundation, under the fertile earth and bloomings of the land, recalling the words of Joseph Campbell: "Myths and dreams... are motivated from a single psycho-physiological source – namely the human imagination moved by the conflicting urgencies of the organs..."⁴⁶ As in the other realms of *Ephémère*, here, all body organs, bloodstreams and other artery or vein-like elements are semi-transparent and semi-abstract, and along with multiple veils of flowing flecks and luminous particles, are engaged in choreographed yet random appearings and disappearings, emergings, lingerings and passings away.



Interior Body, Ephémère

Digital image of 3-D virtual environment captured in real-time through HMD, 1998



Bones in the Interior Body, Ephémère

Digital image of 3-D virtual environment captured in real-time through HMD, 1998

If the immersant floats to a certain depth within the Interior Body realm, she may be surrounded by a slow rain of blazing white egg-like forms, which eventually drift by and slowly fade away. (While I had wanted these Eggs, like the Seeds and Boulders, to be sensitive to the immersant, "opening" to reveal other realms inside, perhaps activated by laser lines of sperm, production deadlines caused this idea to be abandoned.)

⁴⁶ Joseph Campbell, *The Inner Reaches of Outer Space: Metaphor As Myth and As Religion*, 12.



Eggs in the Interior Body, Ephémère
Digital image of 3-D virtual environment captured in real-time through HMD, 1998

In this realm too, there is the recurring element of River, manifested here as a bloodstream, from which issues forth the sounds of calling voices. Sampled from recorded animal cries, these are intended to subliminally affirm *embodied* presence. Like the Forest Landscape's River, and the Under-Earth's stream, the bloodstream has a gravitational pull and if the immersant surrenders to its flow, she can "ride" it, and after a certain length of time, it will respond by summoning in either the Earth or the Landscape all around her. As in the Under-Earth above, all the elements here are differentiated on a vertical axis (in all of *Ephémère's* spatial realms, horizontal navigation by the immersant causes the various elements to constantly reconfigure themselves around the immersant so that there are no outer limits).

Thorns - Vertical Transition: At any time from within the Interior Body, the immersant may deliberately inhale in order to ascend through the various layers of the Body, floating up through the Under-Earth, and if she so desires, continuing upwards into the ever-changing Forest Landscape, and even further. Or, from within the Interior Body, the immersant may choose to go even lower, descending through its deepest depths until she reaches a transitional realm of red Thorns (or neurons, as I wrote about them in the working notes) suspended in empty black space. If she keeps descending, their bright red colour shifts to green, and she will discover she has been "recycled" to the upper foliage of the Forest. Similarly, if while within the Forest Landscape, the immersant chooses to rise up through its highest reaches, she will find the upper foliage has given way to green Thorns which change to red as she continues to ascend until she finds herself rising up through the lowest depths of the Interior Body. The Thorns thus function as a vertical transition, enabling the immersant to cycle vertically through *Ephémère*. (As already explained, if the immersant attempts to seek out the work's horizontal limits, her quest will reveal that each realm is without end, as their elements constantly reconfigure themselves around her.)



Thorns, Ephémère
Digital image of 3-D virtual environment captured in real-time through HMD, 1998

While the immersant could choose to spend the entire duration of her journey in only one of *Ephémère's* three realms, it is more likely that she will pass through them several times. Even so, she can never return to the same place twice. This is because everything around her, all the elements, visual and aural, in all three realms, are constantly in flux.

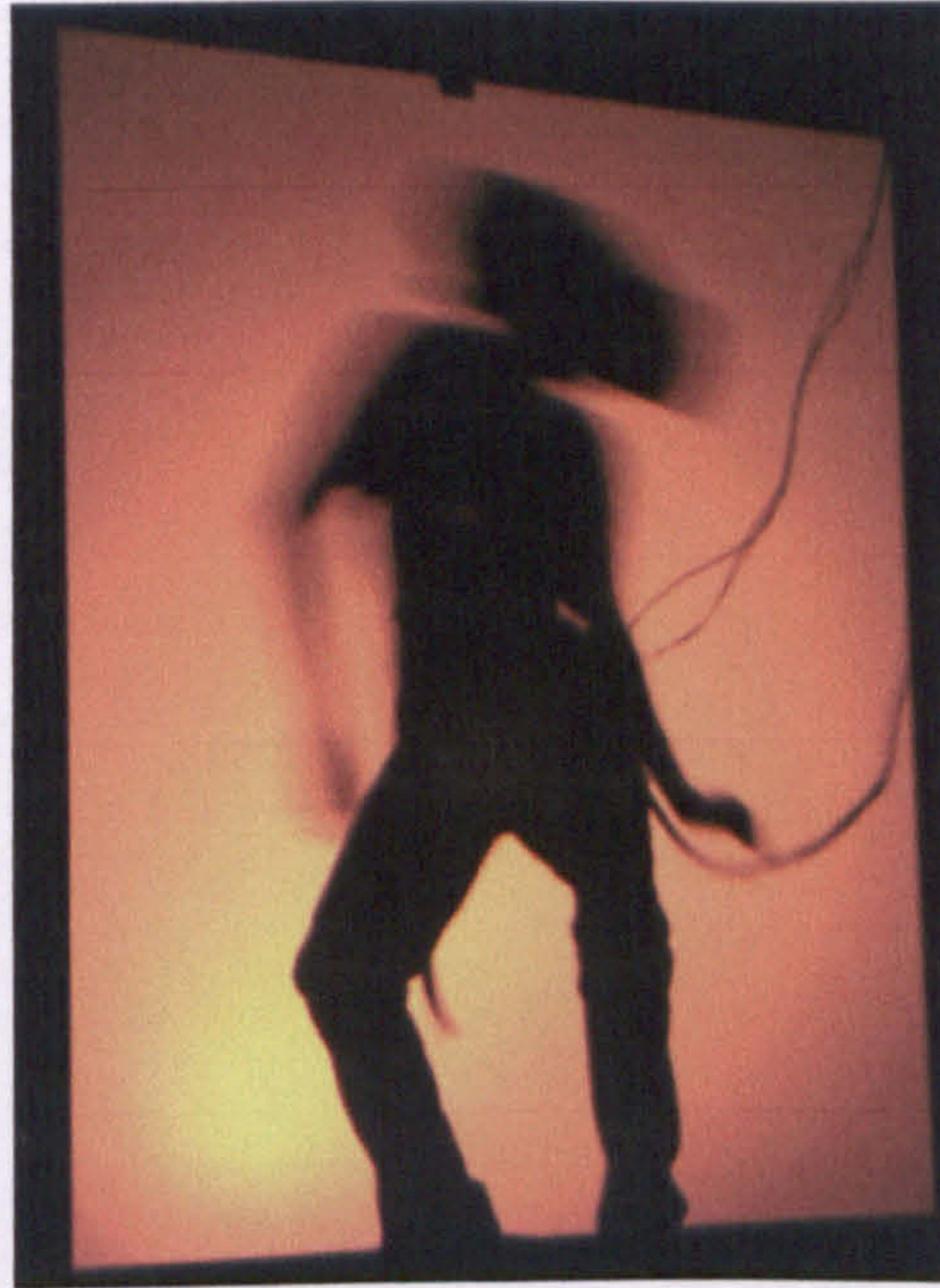


Ending (with bones) in the Interior Body, Ephémère
Digital image of 3-D virtual environment captured in real-time through HMD, 1998

Ending(s): There are several "endings" in *Ephémère*, all of them dependent on where the immersant is during the last phase of her experience. If the immersant is in the Forest Landscape a dozen minutes into the duration of the work, she will find herself enveloped by an abstract realm of oranges and siennas, with trees falling (again, the *Osmose* ghost tree that appeared in the Winter Swamp, but here as a dark silhouette). If she chooses to remain in this autumnal burning, eventually everything drops away until all that remains are ochre leaves falling around her in black space. If she is within the Under-Earth at this late phase, she will experience a distinctive shift in the richness of its sounds and various visual elements, as they begin disappearing, until there are only embers falling in empty space. And if she is within the Interior Body, she will experience the pulsing body organs and bloodstreams giving way to luminous filaments of bone, which in turn also fade away, leaving only ashes drifting through space, ending the immersant's life passage in dissolution.

VI

Strategies and their Implications in the Immersive Experience



*Shadow-silhouette of immersant in Ephémère
during live immersive performance, 2003*

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

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

In the current chapter, I will discuss the specific strategies used in *Ephémère*, primarily in terms of their experiential implications. In this context, I would like to draw the reader's attention to the words of D. W. Griffith above, "*The task I'm trying to achieve is above all to make you see*". In response to the reader's question, "see what?" the answer lies in my two entwined agendas, first mentioned on page 1 of this doctoral text. Both of these agendas, or tasks, are related to transforming perception.

In the context of Griffith's phrase, my first task can be interpreted as wanting to *make people see*, in terms of "undoing" habituated perception and directing attention to the mystery of the presencing of Being: This goal is related to my ongoing quest to articulate my perceptions of subjectively being *in* the world, informed by an attempt to understand our existence in non-dualistic terms, beyond the categories of subject/object, interior/exterior, and human/nature which still go mostly unquestioned in contemporary Western culture. As I have already explained in Chapters II

and III, my intense desire to *re-present* the world, suggesting how it might be, *could* be, beyond our culturally-inscribed assumptions, originates not only in theory but in my own experience. Such experience includes my epiphany in the field, wherein my mind-body expanded to merge with the landscape in total fusion of self and world; and the artistic reclaiming of my extreme myopic vision wherein all distinction between solid form and so-called empty space is effectively dissolved.

In the process of seeking to explore and express such sensibilities through painting, I developed particular strategies and techniques, including the use of semi-transparency and ambiguity as a means of breaking down boundaries, not only between so-called "things", but between perceiver and perceived. At the same time, as a painter I strived to reaffirm the corporeality of the viewing experience, describing space as bodily-enveloping with the perceiver as pivoting centre within an encircling, expansive horizon. I also sought to go beyond our habitual perception of the world as a collection of separate static objects, describing it instead in temporal terms, as transformation and flux; and in doing so, I became increasingly intent on presenting life-flow as emergent (as in an arising or blooming, in the sense of Heidegger's *physis*), and as a flowing-through all things. In my paintings and later 3D digital still images, I also attempted to visually describe an experiential intermingling of spatialities, wherein the culturally-reinforced, habitually-perceived separation between interior and exterior, self and world, was collapsed or entwined in a "post-dualistic" unity.

In the current chapter, I will revisit my strategies for conveying these concerns, in context of their translation into immersive virtual space, and particularly *Ephémère*. I will explain, for example, how my earlier attempt to represent space as all-encompassing has been revisited through use of a stereoscopic head-mounted display (HMD) with a wide field-of-view and low image resolution. In this context, I will also discuss the significance of three-dimensionally localized sound as a means of intensifying experience of spatial envelopment. Next, I will explain how my painterly effort to reaffirm our embodiedness has been translated into a body-affirming interface based on breath and balance; and how the integration of this interface with gaze becomes a means of evoking responsivity through an attitude of *Gelassenheit*, or "letting-be". Additionally, I will explain how I have used painterly semi-transparency in combination with transformation, in an attempt to not only "de-objectify" the virtual realm, but metaphorically present nature as a myriad of comings into being, lingerings, and passings away (as *physis*); as well as to confuse figure/ground relationships and create perceptual ambiguity, thereby "opening" the work to the participant's imagination. I will then discuss the physical installation of *Ephémère* (the same as *Osmose*) in its public context, examining the paradox of presenting subjective experience as public performance, revisiting the "doubled point-of-view" discussed in earlier chapters. (Here, I also want to remind the reader that the very content and structure of my virtual environments with their emphasis on enveloping landscape, subterranean earth – and in *Ephémère*, interior body – along with their recurring elements of roots, rocks, seeds, streams and so on, are a continuation of the themes that preoccupied me as a painter: namely, the metaphoric correspondence of interior body-self with exterior world, and the ephemerality of our life passage, i.e., our mortality as embodied beings.)

As for my second agenda, considered in the context of the wanting to *make people see* – from the very beginning, my intent has been to demonstrate that the medium of immersive virtual space can serve as a means of enabling perceptual transformation. As explained in Chapter III,

most of my concerns and many of my strategies preceded my involvement with digital technology: Indeed, the desire to find a medium which might prove more effective as a means of "carrying" my ideas led to my abandonment of painting more than 15 years ago, for the virtual space associated with 3D digital imaging technology and virtual environments. Even then however, I was well aware of the technology's ideological bias and how its tendencies towards objective realism, disembodiment, and dominating behaviour, reinforce the very technologizing worldview I was attempting to critique and move away from. Hence, my second agenda arose out of necessity: using various strategies, many borne from painting, to deliberately subvert or at least circumvent the technology's representational and interactive conventions. In this context, I wanted to "light lamp in a dark corner" as I have written earlier, demonstrating that the medium of immersive virtual space could be used to express a different sensibility than the status quo. I also wanted to prove that – because of its paradoxical capacity for enabling an artist's vision to not only be seen, but (effectively) *bodily* inhabited – this medium could serve as an *experiential* arena for exploring and questioning our perceptions.

Accordingly, within the last section of this chapter, I discuss the immersive experience itself, describing patterns of behaviour and response of Immersants in *Osmose* and *Ephémère*: In doing so, I draw on psychological research into altered states of awareness, and more specifically, on theories regarding perceptual and cognitive dehabituation and "deautomatization", for it is in this capacity that I believe the transformational potential of the medium lies.

I want to emphasize here that the following discussion of strategies and implications is written from the perspective of artistic/philosophical intent. As the artist who has created such work, it is not my role, nor the purpose of this text, to evaluate whether my intentions have succeeded: this can only be judged with the passing of time.¹

1. The Head-Mounted Display

In *Ephémère*, we deliberately employed a stereoscopic head-mounted display system with a wide field-of-view and low image resolution (as well as audio headphones) as in *Osmose*. I had specific reasons for doing so, which I will discuss below. But first, I want to alert the reader to the fact that few artists are working with HMDs: While in the past, this was an issue of access and expense, at the present time it is more likely that, in the minds of many, this technology has been surpassed by more advantageous methods of display. As a result, even though a decade ago, HMDs were considered technologically advanced, they are now more commonly thought of as somewhat obsolete. Nevertheless, I have continued to use them because of my own particular concerns, and from the belief that no other method exists, which is as capable of meeting my artistic needs.

For readers who are unfamiliar with this technology, inside such a helmet are two small rectangular LCD screens,² each projecting a slightly different and overlapping "view" of the

¹ For interested readers, an extensive bibliography of reviews, articles and essays about my work is included in the Appendix. Many of these can also be read online at www.immersence.com

² The reader may have noticed that this is the first time I have referred to the word "screen" in my entire text. While indeed there are two LCD screens inside the HMD, the specific notion of the "screen" has not been significant to my conceptualization of the medium of immersive virtual space. While many have written about the screen in relation to VR, in comparison, my own conceptualization of virtual space is based on my experience with the two-dimensional surface of

computer-generated three-dimensional scene so as to recreate the effect of human binocular vision with stereoscopic spatial depth. The two views of the scene are generated by the computer in real-time, i.e., on the fly, according to the immersant's "point-of-view" (as she turns her head to look in all directions, including not only forward and to the side, but also behind, above, and below), which is calculated from a motion-detecting sensor located on the top of the helmet. Also, inside the helmet are two stereo audio speakers, important for establishing a sense of spatial presence.

All-encompassing spatiality

Such technology enables a perceptual experience whereby the participant feels *as if* she is inside an all-encompassing spatiality (spherically 360x360-degrees, rather than 360-degree panoramic), a sensation which is effectively realized through her motility *into* and *through* the three-dimensional scene in all its depths. (I want to qualify here – as already explained in Chapter II, when defining the medium of Immersive virtual space and the "virtual" – that in reality, of course, there is no "actual" space there, but rather a *perceptual experience* of such space which is made possible by various technologically-enabled visual, aural and kinesthetic effects. That this experience *feels* real and actual to the immersant is the medium's greatest paradox, and I believe the source of its most intriguing potency. I ask the reader to keep this in mind during the rest of this chapter.)

These days however, HMDs are disparaged for being inconvenient and cumbersome,³ and for limiting access to one person at a time. While admittedly, HMDs may be less convenient than a so-called unencumbered approach – as a scuba diver who willingly dons a mask, skin, wetsuit, fins, regulator, octopus, wrist computer, buoyancy control vest and air tank, *plus* a dozen pounds of weights, to enter the enveloping realms of oceanic space – I consider wearing an HMD to be a minor hindrance in "accessing" so-called virtual space. Furthermore, in comparison to HMDs, other available display systems hinder, or even prevent, the particular effects which interest me. For example, a viewer situated within a panoramic, half/full dome display or even a six-sided CAVE, is able to see numerous visual elements which are extraneous to the virtual realm, including not only (in some cases) the edges of the frame, but more importantly her own body, and various interface devices and the floor itself, as well as other people who may be standing nearby. Such evidence of the "actual" world not only reorients a solitary experience to one of social interaction, but also serves to maintain the viewer's critical distance from the images being displayed. While this may be useful and even necessary in certain applications, such intellectual distancing reinforces the very separation between subject/object, perceiver/perceived that I am attempting to collapse through my work, as explained in Chapter II. As for the solitary aspect, I will return to this shortly.

the painterly picture plane ("picture plane" defined here as "the two-dimensional physical surface on which representation is realized", Edward Casey, *Representing Place: Landscape Painting and Maps*, 125). Hence, my very deliberate emphasis in the subtitle of this text, i.e., *A Painter's Exploration of Immersive Virtual Space...*

As I have already mentioned in a footnote in Chapter II when defining Immersive virtual space, an historical analysis of optical devices antecedent to VR, such as the panorama, diorama, and stereoscope, is outside the scope of the current text. Interested readers should consult Jonathan Crary, *Techniques of the Observer: On Vision and Modernity in the 19th Century*; Erkki Huhtamo, "From Kaleidoscomaniac to Cybernerd: Notes toward an Archeology of Media"; and Oliver Grau *Virtual Art: From Illusion to Immersion*.

³ I am aware that various studies have questioned the safety of HMDs: however, given that immersion in my virtual environments is limited to 15 minutes per session, I do not consider this a pressing issue in the context of my own work.

First of all however, I want to explain that *not* being able to see one's own body (or anyone else's for that matter) during the Immersive experience is an essential aspect of enabling the particular effects I am seeking, in terms of increasing the Immersant's sense of Immateriality while at the same time intensifying her sense of subjective embodiment through use of breath and balance in the interface (a paradox I will return to in the next section). In particular, I want to emphasize that I have deliberately chosen not to visually represent the Immersant's body as a cyber-hand or iconic model, because to do so objectifies the body, turning it into a thing "out there" (thus reinforcing the Cartesian disconnect between thinking subject, *res cogitans*, and object world, *res extensa*): In comparison, I am attempting to approach the participant's body as a subjectively "lived-body" or "*I-body*"⁴ inhabiting virtual space.

Wide field-of-view

Returning to my discussion of HMDs, I believe that if the artist/designer's intention is to enable sensations of total, full-body spatial envelopment, as it is in my case, it is essential that the stereoscopic HMD has an *extremely* wide field-of-view (i.e., at least 110-degrees with the two overlapping views). Whereas helmets with narrower fields-of-view present little more than a rectangle directly before the viewer with evident edges of the frame, an HMD that is expansive enough to contain the viewer's entire peripheral vision⁵ can potentially facilitate a different kind of perceptual experience. In such experience, rather than merely looking at/through the frontally-oriented window⁶ of a two-dimensional planar surface, it is as if the viewer-now-Immersant has effectively crossed *through* the picture plane, *beyond* the confines of the frame, and *into* a body-

⁴ See the "Translator's Preface" by Alphonso Lingis, in Merleau-Ponty, *The Visible and the Invisible*, (p. *liv.*) In this context, Lingis is referring to Merleau-Ponty's concept of the "subject's own corporeity as given to him as his 'lived body' or 'I-body' distinguished from his objective body, appearing publicly as a thing among things of the world", (Ibid.) as developed in the *Phenomenology of Perception*. Here however, Lingis is actually differentiating between this earlier concept and Merleau-Ponty's later and ultimate understanding of the body as flesh, in terms of chiasmatic intertwining, as "the visible seer, the audible hearer, the tangible toucher - the sensitive sensible" (Ibid.) and so on - which I am not referring to in this section of my text.

While discussing the spatiality of the subjective body in the *Phenomenology of Perception*, Merleau-Ponty, emphasizes that "We must ... avoid saying that my body is *in* space, or *in* time. It *inhabits* space and time". 139.

⁵ While I do not have time here to discuss the experiential implications of the difference between foveal and peripheral vision, I want to quote the following to provide the reader with an idea of where such a discussion could go. As cited in David Michael Levin, *The Opening of Vision: Nihilism and the Postmodern Situation*, Jean Paris' comments (in *Painting and Linguistics*) on J.F. Lyotard's philosophical appropriation of an analysis of vision by the scientists Barre & Flocon in *La perspective curviligne*, by summarizing: "... the weakening of the peripheral vision to the benefit of the foveal one deprives us of a 'vast lateral fringe' that 'the focalized attention represses'; and the ocular mobility, by structuring only the 'knowable',... [succeeds]... in making us reduce the 'true' space, which is curved, to our three arbitrary dimensions". (As cited in Levin, 239-240.) And further (omitting here Paris' longer comment regarding the scientists' suggestion of setting the eyes on a single point for an extended period of time in order to eliminate "organized vision"): "and soon 'instead of the rectangular, stabilized, constant, central space of the foveal vision', you will discover 'this curved twilight, evanescent, lateral space'...." (cited in Levin, 240.)

⁶ The window analogy originates with the Renaissance theoretician Leon Battista Alberti, who in his 1435 treatise on art, *Della Pittura (On Painting)*, translated by John Spencer [New Haven: Yale, 1966], and cited by Panofsky in *Perspective As Symbolic Form*, 76) writes: "I inscribe a quadrangle... which is considered to be an open window through which I see what I want to paint". According to Hubert Damisch in *The Origin of Perspective*, this concept of the image as window (and of "perspective as *seeing through*") was replaced by the very different notion of the perspectival paradigm developed by Brunelleschi and advanced by Piero della Francesca's language. (67.)

enveloping, all-encompassing spherical spatiality. (Again, I want to emphasize that I am referring to immersion in a spherically 360x360-degree environment, including beneath one's body, rather than the 360-degree panorama or even half domes/cubes more commonly associated with VR.)

This effect, however, necessitates a strange kind of artistic surrender (one could even suggest a releasement (*Gelassenheit*) or letting-be), whereby the traditional painterly or even photographic endeavour of carefully composing imagery in relation to the energizing confines of the frame⁷ must be relinquished to the Immersant's motile point-of-view *inside* the space. And, when this happens, i.e., when the frame is experientially transcended by the Immersant, not only is a significant amount of prior artistic control diminished, but the containment of the imagery within the frame is also sacrificed and what Edward Casey calls its "pictographic energy"⁸ is lost. However, from the standpoint of Keiji Nishitani, when the framing apparatus of "perspective, picture frame, or camera" is withdrawn, so too the oppositional duality between subject and object: then, just as the unframed object opens out "omnidirectionally onto the universal surround", so the viewer is also "radically dis-framed".⁹ Similarly, when the frame - which, as David Summers suggests, is a "condition for both 'objectivity' and 'subjectivity'"¹⁰ - is abandoned, then what I have previously referred to as the painterly paradox of the "doubled point-of-view" also falls away.

⁷ See my extensive footnote in Chapter II, 3.5, *Landscape, as virtual place*, regarding Edward Casey's discussion on the pictorially-energizing effects of the frame. (Casey, *Representing Place: Landscape Painting and Maps*, 125-126.)

⁸ *Ibid.*

⁹ Norman Bryson, "The Gaze in the Expanded Field", 100. As Bryson explains it, "Nishitani's move is to dissolve the apparatus of framing which always produces an object for a subject and a subject for an object. Passing on to the field of *sunyata*, the object is found to exist, not at the other end of tunnel vision, but in the total field of the universal remainder. The object opens out *omnidirectionally* on to the universal surround ... The viewer who looks out at the object sees only one angle of the visual field where the object resides, one single tangent of the 360 degrees of the circle, and of the 360 degrees in all directions of the radiating sphere of light spreading out from the object into the global envelopment". And, as Bryson further explains, "In the same way that Nishitani takes the object away from the framing apparatus - the picture frame, the legitimate construction - and places it on the expanded field of blankness or *sunyata*, so the viewer is pulled away from the aperture of the viewfinder or lens and redefined as radically dis-framed. The viewer still has his or her eyes open: the universe does not disappear. But the viewer is now a being that exists through the existence of everything else in the universal field, and not just as the subject-effect of the object that appears at the end of the viewing tunnel. Let us say that the viewer's eyes look out a segment of the total field that surrounds the viewer omnidirectionally." 100.

As Bryson further writes, "Once dis-framed, the brightly luminous segment [the small conical section that the viewer sees, which is a "fraction of the field of universal surround"] is found actually to be constituted *within* the invisible, the dark or unmarked remainder that extends beyond the edge of peripheral vision into the space that wraps its way round behind the spectator's head and behind the eyes. What can be seen is supported and interpenetrated by what is outside sight, a Gaze of the other enveloping sight on all sides. *How can such a Gaze be represented? For surely now we stand at the very limits of representation.* From this point on, only a technique which undermines the frame can stand in for the invisible which the frame excludes. And if we try to picture to ourselves the Gaze of *sunyata* or blankness, it must be in terms of the nonrepresentational or the anti-representational. ... The fullest expression of *sunyata* in the visual field is undoubtedly the practice that immerses itself in this concept, *Ch'an* painting". 101.

In context of describing such painting, (i.e., 15th century *Ch'an*: Chinese; or *Zen*: Japanese.) Bryson explains that "...in the flying of the inks there is an entry into the visual field of something totally dark and opaque that stands for absolute alterity: the otherness of the rest of the universe, a surrounding field that decenters the subject and the subject's vision completely. When a painter or calligrapher throws ink, there is renunciation of all claim to act as universal center and at the same time (*pace* Sartre) renunciation of the object as *alternative* universal center". 104.

¹⁰ Summers, *Real Spaces: World Art History and the Rise of Western Modernism*, 526.

(However, I revisit this paradox in my installations whereby the Immersant's point-of-view can be observed by viewers exterior to the virtual scene, as I will explain later in this chapter).

Most significantly in the context of Immersion in virtual space, when the frame is effectively transcended, there is potential for a radical experiential shift: Rather than being viewed from *without*, the contents of the artwork are now effectively viewed from *within*; and when this happens, two-dimensional *image* is transformed into three-dimensional *space*, and *representation* into bodily *experience*. Or, as phrased another way, the represented visual field (or field of vision¹¹) ceases to be read as an upright planar surface or screen (that one can look at and through), and, in effect, becomes an *enveloping field*, encircling the viewer's body all around.¹² It is precisely because of this transformation, that I believe this medium is well-suited for artistically representing the circumambient, overflowing horizontal experience of landscape (as I have already suggested in Chapter II) – but more than that – I would also venture to say for presenting an interpretation of subjective experience of the phenomenal world itself,¹³ whereby it is no longer represented *frontally* in terms of *world-as-picture*,¹⁴ but rather as spherically-encompassing *world*, that the perceiving subject bodily inhabits, i.e., is in and of.

This experiential shift cannot take place, however, if the Immersant is wearing an HMD with a narrow field-of-view (or if she is in a panoramic display or CAVE). And, unfortunately for my purposes, in the past few years, commercial manufacturers of relatively low-priced HMDs for games, scientific visualization and other applications, have been narrowing the field-of-view of

¹¹ "Field of vision" one is defined by Summers as following: "A surface treated as if it were an essentially *optical* continuum of light, dark and color. The incident of a natural surface in light might be treated as such a field, but unity and analogy to vision are usually further defined by *framing*". 684. In this context, Summers further defines "frames/framing" as "presupposing planar surfaces and their division; in the case of framing, the division of surface is identified with virtual spaces and with the limits and unity of a *field of vision*". 685.

¹² The issue of frontal planarity and surface in relation to optics, vision and virtuality is discussed at length by Summers. (See my previous discussion of virtuality in my Chapter II, 2.1, *The virtual*.) More relevantly to my current discussion, he suggests that "Planarity might be called *anoptical*, while surficiality [as he calls it] is inherently optical, and so is related to the virtual"; and further, that "the surficial, as analogous to the optical, underlies all virtuality". 336. And most significantly in regards to images, he writes that "Virtuality presupposes the *presentation of the world as a (usually upright) format*, and the transposition of the surfaces of things seen onto that surface". 341. Emphasis mine.

Summers' comments become particularly interesting when applied to immersive virtual space, whereby, in effect, the experience goes beyond the "surficial" to become all-enveloping. Again, I want to point out that I am speaking of *experiential effect* rather than actuality, because, of course, there are two planar surfaces, i.e., the LCD screens, in the HMD. However, as I have already explained, it is not this issue which interests me, but rather the perceptual experience which is facilitated or enabled by the particular characteristics of the technology as I have approached them.

¹³ In referring to subjective perceptual experience here, I am speaking only of humans. Although at times I have considered attempting to extend this beyond the human in my work, to do so immediately raises not only the issue of anthropomorphizing but of human arrogance, i.e., that one could even presume to understand, much less represent, the subjective world or *umwelt* (von Uexkull, 1926) of another, non-human, creature. Also, in context of my statement above, I am talking within the limits of artistic representation, rather than one's subjective experience of the actual world with its unfathomable depths of living and non-living beings.

¹⁴ See Heidegger, "The Age of the World Picture", whereby he writes that "The fundamental event of the modern age is the conquest of the world as picture. The word 'picture' [*bild*] now means the structured image [*Gebild*] that is the conquest of man's producing which represents and sets before". 134. Earlier in Heidegger's essay, the translator William Lovitt, in footnote #8, explains that the word "represent" suggests "an objectifying", as in a "bringing to stand as object". 120.

HMDs, as much as to 30-degrees, while developing higher image resolution instead.¹⁵ (While such high-resolution may be important for applications involving scientific visualization, medicine and so on, this privileging of sharper visual detail over field-of-view arguably reflects a bias towards objective realism, as suggested in Chapter I.) In any case, as a result of such prioritizing, there are no new HMDs available which meet my requirements.¹⁶ Therefore, we have had no choice but to continue using, for exhibition purposes, the helmets I obtained more than a decade ago, because they do have a wide (110-degree) field-of-view. These particular helmets also have reduced image resolution, which has been remarked upon by many who expect to see high-definition images when "entering" my work. There is, however, a significant advantage to such low resolution.

Low-resolution visuals

Contrary to what most people assume, low resolution in the graphics actually *intensifies* experience of immersion. My explanation is that such low resolution creates a pronounced softness (or fuzziness) in the visual field which effectively counteracts or disables the dominant sense of sight, allowing the body's non-visual modes of perception (including hearing) to come forward. This enables a much more embodied experience of space, whereby it feels not empty but viscously full and enveloping, nestling close upon the skin: Or so I would say, as someone who goes through the world with extremely myopic eyes.

In this context, I would also suggest that the "visual acuity" associated with normally sharp binocular sight (and equally, a high-resolution HMD, especially with a narrow field-of-view) tends to literally "focus" one's perceptual attention on what lies *before* or *in front* (as a collection of hard-edged "objects" distantly "out there"), accompanied by one's cognitive attention also being "focused" on what lies before, not only spatially, but temporally, in terms of expectations of the future.¹⁷ As a result, one becomes attentionally absent to the present. Conversely, when visual acuity is softened, whether due to extreme myopic eyesight or a very low-resolution/wide field-of-view HMD, one's perceptual attention is redirected (for the simple reason that one can no longer see), to what one "feels" lies *all around*, including the immediate sensation of contact with the ground beneath one's feet. Accordingly, one's cognitive attention is also redirected (from what David Michael Levin calls "the 'frontal' ontology of our modern, nihilistic world"¹⁸) to an awareness of one's own subjectively embodied presence *inhabiting* space, in the present here and now.¹⁹

¹⁵ My comments do not refer to research being pursued by the U.S. military. One can assume that such research includes developments that far exceed what I am discussing here.

¹⁶ The current impossibility of locating new HMDs which meet my particular research and exhibition requirements may well lead to the ending of my work in immersive virtual space. More optimistically, I have recently become involved as the initiating artist in a multi-year university engineering project in Québec funded by the Canadian government, with the specific aim of developing an HMD system which might meet my requirements. This has positive implications for the legacy of my work, as well as whether I continue to do research in this field, in terms of creating additional immersive virtual environments.

¹⁷ My comments about this shift of awareness associated with myopic vision and low resolution computer graphics are based on my own experience rather than on theories or analyses by others.

¹⁸ David Michael Levin, *The Opening of Vision: Nihilism and the Postmodern Situation*, 68. For example, he writes, "In the authoritative texts of modern philosophy, vision is always re-presented by a straight line of sight, sharply focused, absolutely clear, and fixed on its object, something positioned directly in front". *Ibid.*

¹⁹ If we had been using helmets with higher image resolution, no doubt, in order to achieve this same effect, we would have had to develop (i.e., to program) a compensatory filtering method to

This phenomenon, which I have referred to in Chapter III in context of my own myopic vision, also recalls my critiques of modern visuality in previous chapters.²⁰ Most interestingly, it resonates with my earlier discussion of Scheibler's account of Heidegger's concept of releasement (*Gelassenheit*), as a shifting of awareness away from an "awareness of a world of objects to an awareness of the field of awareness".²¹ I will return to this shift of awareness again.

Solitary, cloistered, and bodily-fluid

I now want to mention several other characteristics of the HMD which are integral to my work: this includes its solitary and cloistering nature.²² In comparison to interactive works which seek to facilitate social interaction with other people (whether physically present or remotely), my virtual environments are deliberately designed for solitude, requiring that the immersant withdraw from the shared human world to undergo the experience. Such withdrawal also involves a temporary and voluntary isolation from the everyday physical world, effectively placing the immersant in a realm which is entirely art-ificial. This is very different from the so-called "augmented reality" enabled by certain HMDs designed to enable the viewer to see virtual graphics superimposed over her actual surroundings: In comparison, for my purposes it is essential that the immersant is not only cloistered from the actual world but is totally encompassed *within* my spatio-temporal construct, in what was once known as the "artist's vision", now effectively expanded beyond the 2D painterly picture plane to become spherically, bodily, enveloping.

Because of this solitary aspect of my work, the issue of access has sometimes been raised, particularly because each participant is immersed for an entire quarter of an hour (900 seconds to be precise), so that only 20 to 30 individuals are able to undergo the experience each day. Accordingly, I have been asked why I did not make these works more accessible by designing them for more than one individual at a time, or why I did not shorten the immersive sessions to allow more people to have the experience in a single day.²³ My answer has always been the same: that both *Osmose* and *Ephémère* were designed as "modes of access" to *solitary* contemplation, which, when combined with deep and rhythmic breathing over 15 minutes, can potentially facilitate transformations of perception. In this context, I believe that the possibility of such transformation is dependent on turning the immersant's attention away from so-called external, habitually-perceived

soften and reduce the sharpness or acuity of the visuals. I say this because when we did test higher resolution HMDs, the immersive experience became more conventional, with the habitual reliance on sight taking precedence over other means of "sensing" space as all-around.

²⁰ See my references to critiquing modern vision and Cartesian perspective in Chapter I, 1.1, *The cultural bias in 3-D computer imaging techniques*; seeing "from a distance" in Chapter II, 3.2, *Landscape, as representation*; discussion of my myopic eyesight and Merleau-Ponty's description of night in Chapter III, 1.3, *The painter's body: Soft sight reveals "a spatiality without things"*.

²¹ See my discussion in Chapter I, 2.1, *techne as poiesis*. (Scheibler, "Heidegger and the Rhetoric of Submission: Technology and Passivity", 128-129.)

²² This too is similar to diving, whereby even if in the company of other divers, the experience is primarily solitary, accompanied only by the sound of one's own breath, inhaling, exhaling and bubbling upwards to the surface. If one holds one's breath, which one is *never* supposed to do for safety reasons, it becomes possible to hear all the creatures going about their secret lives...

²³ Soon after *Osmose* came out, I approached by a location-based entertainment company interested in commercializing the work. They, of course, asked me such questions: My response was that I was not interested in compromising the integrity of my work by altering it to enable more "throughput" for such purposes.

reality, and redirecting it towards the sensations of her "interior" experience of the immersive environment.

According to Bachelard, such interiority, as experienced through solitude, is linked to spatial immensity: "Immensity is within ourselves" he writes, and "... is attached to a sort of *expansion of being* that life curbs and caution arrests, but which starts again when we are alone".²⁴ (Similarly, Rilke writes that "The world is large, but in us it is deep as the sea".²⁵) Indeed, as Bachelard explains, "It would seem, then, that it is through their 'immensity' that these two kinds of space – the space of intimacy and world space – blend. When human solitude deepens, the two immensities touch and become identical".²⁶ Bachelard's comment recalls my previously described experience in the field, as an "expansion of being" whereby interior and exterior, intimate and world space, became one. Here I want to emphasize that this experience could only have happened while I was alone, that is, in the very solitude to which Bachelard refers. I also want to point out that it took place in darkness, when my visual acuity was dramatically reduced and my body's other ways of sensing space had come forward: That this was so, further supports my belief that HMDs (with the characteristics outlined above) are the most effective means of immersive display for enabling the perceptual effects that interest me, at least at the present time.

Lastly, I want to comment on yet another reason that I favour using an HMD, and this has to do with its capacity for allowing body *fluidity* (that is, not mobility in terms of actually going somewhere, but of maintaining the body's inherent fluidity even while remaining in the same place, as in Tai Chi,²⁷ as suggested in Chapter II, 2.4 *Reaffirming subjective embodiment in immersive virtual space*). In comparison to VR display systems which require the viewer to sit/stand immobile at manual controls, or be attached to a viewing device (all of which confine, reduce and even negate the expressivity of the immersant's lived body, as suggested in Chapter I), an HMD integrated with a breath and balance interface encourages the immersant to be wholly present and balanced *in* her body. In fact, for my work, the richness of the immersive experience *depends upon* the immersant being physically flexible as well as proprioceptively aware – not only turning all around to see and hear, but also breathing, balancing, bending and crouching and so on. In comparison to merely watching and pushing buttons, or manipulating levers (in a continuation of habitually rational and controlling behaviour), here the immersant's subjectively-inhabited body literally becomes the medium for *bringing the work into being*. (Considering the interface in this way, recalls Heidegger's notion of art, as *poiesis*, in terms of bringing-forth...)

²⁴ Bachelard, *The Poetics of Space*, 184. Emphasis mine.

²⁵ Rilke in Bachelard, 183. In the same chapter, entitled "Intimate Immensity", Bachelard also quotes Rilke as follows, "(Space, outside ourselves, invades and ravishes things:/If you want to achieve the existence of a tree,/Invest it with inner space, this space/That has its being in you. Surround it with compulsions/It knows no bounds, and only really becomes a quest and tree/If it takes its place in the heart of your renunciation.)" 200.

²⁶ *Ibid.*, 203. In this context, Bachelard further writes, "In one of Rilke's letters, we see him straining toward 'the unlimited solitude that makes a lifetime of each day, toward communion with the universe, in a word, *space*, the invisible space than man can live in nevertheless, and which surrounds him with countless presences". In this context, Bachelard goes on to explain that "This coexistence of things in a space to which we add consciousness of our own existence, is a very concrete thing. Leibnitz's theme of space as a place inhabited by coexistants has found its poet in Rilke. In this coexistentialism every object invested with intimate space becomes the center of all space. For each object, distance is the present, the horizon exists as much as the centre". 203.

²⁷ In this context, I do not mean Tai Chi specifically, but any body-practice which involves subtle control of bodily balance and movement, while remaining standing vertically in one place.

2. Sound

Even though, as a former painter, I tend to emphasize the more visual implications of my approach to the medium of immersive virtual space, the significance of sound in enabling experience of full-body immersion should not be underestimated.

In addition to being a visually immersive environment, *Ephémère*, like *Osmose* before it, incorporates three-dimensionally-localized sound which plays through stereo headphones in the HMD. Most significantly, the sounds in both works have been designed to transform on the fly, i.e., in real-time, in response to the immersant's behaviour. The result is an all-encompassing nonlinear auditory environment which is in constant flux, consisting of endlessly recombining sounds, whose qualities of tone, pitch, rhythm and melodic cyclings are wholly dependent on the immersant – e.g., her continually-changing direction of gaze, relative body position and speed/slowness within the scene, and her proximity to various visual and aural elements – in addition to the ever-transforming relationships between the elements themselves, and various meta-cycles of temporal processes within the work. (My conceptualization of the sound in *Ephémère*, in terms of its ambiguity and so on, is best explained in the email to the sound crew included in the *Ephémère* working notes of February 1997, as well as other references to sound in those same notes. More technical descriptions of the sound design, written by Dorota and Rick, are included in the Appendix.)

Such all-enveloping, nonlinear and responsive sound – when combined with the previously discussed visual and spatial effects of the HMD – plays a very significant role in providing spatial cues which intensify the immersant's sense of being spatially and temporally immersed in the virtual realm. In this context, the work's visuals and sounds are experienced through what could be described as a synaesthetic merging of the immersant's eyes and ears. As David Abram explains, in addition to the "chiasm between the two eyes, whose different perspectives continually conjoin into a single vision" (approximated here through the stereoscopic effect of the two views in the HMD), according to Merleau-Ponty, there is a chiasm or confluence between the "various sense modalities, such that they continually couple and collaborate with one another".²⁸

This confluence takes on particular importance when the HMD has low-resolution graphics: As I have already proposed earlier in this chapter, when the visual acuity associated with sharply-focused sight is decreased or disabled through a low-res HMD (just as in extreme myopia), other perceptual modalities, such as hearing, come forward in compensation. The resulting experiential effect is a shift of awareness from what lies in front (usually in terms of discrete objects viewed as separate from one's self) to what lies "around" in the immediate present: Sound, because of its inherently all-encompassing quality, plays a huge role in supporting this attentional shift. Furthermore, because the listening subject is enveloped by auditory flux which seems to penetrate the boundary of the skin, sound can effectively confuse, or undo, dualistic distinctions between interior and exterior, with and without. Accordingly, the Australian sound theoretician Frances Dyson has said that "Metaphysically, sound has an ontology that challenges the solid world".²⁹

²⁸ David Abram, *The Spell of the Sensuous: Perception & Language in a More-Than-Human World*, 128.

²⁹ From my own notes, regarding comments made by Frances Dyson at the ISEA conference in 1994. I have chosen not to write further about sound in virtual space since others such as Dyson have done so with far more insight than I, as a primarily visual artist, could bring to the subject. See for example, Dyson, "A Philosophonics of Space: Sound, Futurity and the End of the World".

3. The User Interface

The user interface in *Ephémère* (as in *Osmose*) has been deliberately designed to be body-centered, dependent on the intuitive and interior processes of breathing and balance, as well as the immersant's gaze, in combination with her relative proximity to certain responsive elements. By emphasizing the Immersant's living breathing body as medium for the Immersive experience, my intention is to affirm the essential role of the subjectively-inhabited body in virtual space.

As I have already explained when describing *Osmose* in an earlier chapter, the breath and balance interface involves the use of motion-capture sensors integrated into a vest worn by the participant: one sensor is integrated into a device³⁰ that measures the expansion and contraction of the chest as the immersant engages in breathing. Two other sensors are placed vertically in the back of the vest along the participant's spine to measure changes in balance as he or she leans forward, back or sideways (moving in the "x" or "z" axes around a vertical "y" axis, to use Cartesian terms), and also, changes in relative height by bending the knees. Another sensor is incorporated into the HMD which tracks the rotational direction of the Immersant's head. These sensors are linked to the computers and digital sound synthesizers/processors. Accordingly, depending on the Immersant's body movements (looking all around, including behind, above and beneath; inhaling or exhaling to rise up or descend; leaning and shifting balance to move in various directions; and crouching to increase speed), the computer calculates the Immersant's point-of-view and relative spatial position and generates the appropriate visual elements and aural effects in real-time.

Breath

There are several aspects of the interface that I wish to examine here. First of all, as I have mentioned before, the use of breathing – in to rise and out to fall – is intended to facilitate a sensation of "floating", as if the Immersant's body were free of gravity. This sensation is intimately known to scuba divers who use breath and balance to subtly control their body's buoyancy when maneuvering vertically or horizontally in oceanic space. Such sensations in virtual space (as well as in oceanic space) can evoke euphoric feelings of immateriality and even disembodiment, even though of course, in actuality, they are thoroughly embodied.

In *Osmose* and *Ephémère*, we have purposefully amplified such sensations of immateriality by employing semi-transparency in the visuals, as I will explain in the next section, to enable the Immersant to see through and virtually pass through everything around her (and experience everything passing through herself as well) – as if she had no physicality at all. Most significantly however, at the same time we have deliberately *confounded* such sensations by simultaneously

³⁰ Several years ago, because of comments received from Immersants regarding difficulty in moving up or down using breath, we decided to upgrade our methods of measuring the breathing. Our original device had consisted of a variable resistor, which would slide back and forth as Immersants inhaled and exhaled, i.e., as their chests expanded and contracted. Ultimately, this proved not to be adequately sensitive. We therefore began experimenting with other devices, and finally contacted a medical design company which constructed a small high-quality device placed on a bellows which was mounted on the interface vest. As the Immersant breathes, the bellows expands and contracts accordingly, affecting the air pressure in a tube connected to a highly sensitive air-pressure sensor. The air pressure is then converted to a voltage which is converted to a number ranging from 1-255, which is then transmitted to the computer. Since we have begun using this optimized system, it has become much easier for all Immersants to use breathing as a means of navigating in *Osmose* and *Ephémère*.

anchoring or "grounding" the experience in the Immersant's own body, that is, in her own breathing, balance, and proprioceptive skill. In doing so, my intention was not only to reaffirm the Immersant's subjective embodiment, but also, by enabling her to feel simultaneously "afloat" and bodily grounded, to deliberately confuse, and even interfuse, hitherto dualistic categories of immaterial and material, mind and body, virtual and actual. This becomes most literal, since the Immersant, even while experientially (effectively) within virtual space, is breathing the air, in and out, in and out, from the actual environment around her.³¹

In this context, Drew Leder's discussion of the Zen meditation practice of following one's breath is quite relevant, particularly when he writes of breath as a "potent tool for surpassing dualism".³² "Physiologically", Leder explains, "respiration stands at the very threshold of the ecstatic and visceral, the voluntary and the involuntary": thus, even while it is possible to modulate one's breathing at will, it basically remains an automatic function, whereby the meditator finds that she "is breathed" as much as she is "the breather".³³ Accordingly, he explains, "breathing becomes the very prototype of Zen/Taoist *wu-wei*, literally translated as 'non-action'", a term referring to the "effortless acting typical of one who has broken free from ego-identification".³⁴

There is also another way, Leder suggests, in which "meditation on the breath can carry one beyond the separative ego", explaining that "... breathing actualizes our one-body relation with the surrounding world. ... Inside and outside, self and Other, are relativized, porous, each time one takes a breath".³⁵ Even the air itself, he says, is constantly "transgressing boundaries, sustaining life through inter-connection".³⁶ This notion (which I have already mentioned in Chapter II, 5.4, *A permeability of boundaries*) can remain an abstract idea, Leder cautions, even if one has spent years studying the mystics on the "unreality of dualism": "But in following the breath", he explains, "one begins to embody this truth".³⁷

Our use of breath in the *Osmose/Ephémère* interface has yet another implication as well: When sustained over an uninterrupted duration of 15 minutes, such breathing can have a very calming and relaxing psychological and physiological effect on Immersants. This too recalls Leder's description of Zen meditation practice, whereby, when attention is repeatedly returned to the act of breathing, "the rise and fall of the breath serves as a repetitive and calming stimulus" which "establishes a neutral focus that frees one up from customary thought processes".³⁸ (I will return to the implications of this in the final section of this chapter, when discussing techniques for bringing about such perceptual dehabitation.) Similarly, the use of breathing in *Osmose* and *Ephémère* can potentially facilitate a kind of "mindfulness", whereby the Immersant's attention is

³¹ In this instance, Summer's comment (in context of the development of virtuality in early Chinese landscape paintings) about breath (Latin: *spiritus*) as akin to the life principle as in the Taoist *ch'i*, seems strangely prescient: "Virtual spaces might thus be seen to be defined not just by atmosphere, but by the breath or spirit of a place, or of the world, in which the viewer is by implication also enclosed." 466.

³² Drew Leder, *The Absent Body*, 171. Emphasis mine. I have quoted some of his following comments earlier in the *Osmose* white paper in Chapter IV.

³³ *Ibid.*

³⁴ *Ibid.*

³⁵ *Ibid.*

³⁶ *Ibid.*, 171-172.

³⁷ *Ibid.*, 172.

³⁸ *Ibid.*, 171.

constantly being returned to the presence of her own body, in the present here and now: this is particularly so when combined with the need to continually maintain her centre of balance while seemingly floating in virtual space.

Balance

When first conceptualizing our use of balance in the interface – in terms of the Immersant's shifting around her body core – I found the insights of David Michael Levin very helpful in imagining how balance could also be used to overcome dualism. In *The Body's Recollection of Being: Phenomenological Psychology and the Deconstruction of Nihilism*, Levin writes of balance as a question of "centering".³⁹ In this context he explains that "When we are properly centered, our experience of Being is in equilibrium": And once we are "well-centered", we can encounter other beings in "a more open, receptive way".⁴⁰

Accordingly, *finding* one's centre becomes an essential step in the development of one's "ontological capacity to open [oneself] to the larger measure of Being and to encounter other beings with equanimity, justice, and a presence that is deeply responsive": Or, phrasing it another way, Levin writes, "Coming 'home' to our true centre of being, we can begin to relax our egological defences and begin to experience things outside the subject/object polarization".⁴¹ For Levin, being "well-centered in Being" is at the very root of what he calls "*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".⁴² This attitude (introduced in Chapter I, in context of Heidegger's meditative thinking), is one I will return to shortly.

Levin writes that "Balance concerns our vertical alignment, our standing in relation to a vertical axis. The two poles of this axis are the earth and the sky, the element of our grounding and the element that teaches us spaciousness".⁴³ Such a statement can also be applied to our use of balance and breath in *Osmose* and *Ephémère*: Here, the vertical axis of the Immersant's body – as subjectively experienced not only through grounding contact with the actual floor,⁴⁴ but also in terms of rising vertically or descending in virtual space, by inhaling and exhaling – is mirrored in the spatial structure of both works, with their emphasis on "above" and "below". (As well, the under-earth of both works could be interpreted as Levin's "ground which holds us up and at the same time pulls us down, weighing us with the gravity of our own mortality".⁴⁵) Similarly, the

³⁹ Levin, *The Body's Recollection of Being: Phenomenological Psychology and the Deconstruction of Nihilism*, 274. I want to draw the reader's attention to the fact that these words are those of David Michael Levin. I first quoted his comments on balance in the *Osmose* white paper in 1994, and in several essays since: In doing so, I misattributed his comments to Drew Leder (because of the similarity of their names) who I was quoting at the same time in regards to breath. Upon realizing my error, I have made all attempts to correct it, with sincere apologies to Mr. Levin.

⁴⁰ Ibid.

⁴¹ Ibid.

⁴² Ibid.

⁴³ Ibid., 273.

⁴⁴ Many years ago, after I had given a lecture about my work's emphasis on keeping participants bodily grounded during the immersive experience, an engineer from NASA came up to me and said that much to his astonishment I had disapproved their theory of the "leans", by which he was referring to people losing their balance in virtual environments and becoming nauseous.

⁴⁵ Ibid.

horizontal "cardinality"⁴⁶ of the Immersant's body, extending from her body's centre (my painterly "pivot") towards an enveloping horizon, is mirrored in the more horizontal spatial realms of *Osmose* and *Ephémère*, within which their various elements constantly reconfigure themselves around (and *through*) the Immersant's continually moving body-self.

In this context, the Immersant's self-movement or navigation within the virtual environment depends upon remaining centered/balanced *within* her own actual body: for when navigating through a virtual realm without any stable static surfaces and within which she can buoyantly float in any direction, the only spatial reference is her own body cardinality (illustrating Merleau-Ponty's concept, discussed previously, that space *begins* from the perceiving subject, "starting from me as the zero point or degree zero of its spatiality"⁴⁷). This further resonates with Merleau-Ponty's statement that "motility" is not merely "a handmaid of consciousness, transporting the body to that point in space of which we have formed a representation beforehand", but rather, "consciousness is [a] being-towards-the-thing through the *intermediary* of the body"; and motility is learned only when "the body has understood it, that is, when it has incorporated it into its world, [whereby] to move one's body is to aim at things *through* it; ... to allow oneself to respond to their call..."⁴⁸

There is, of course, a cognitive/perceptual paradox here, related to the medium of immersive virtual space itself, of experientially (effectively) being in two places at the same time: for even as the Immersant is experiencing sensations of floating through virtual space, she is standing firmly (particularly so, because she is constantly balancing herself through the soles of her feet) on the actual floor. Rather than this situation being disjunctive however, for my purposes it is intended to further confuse Cartesian dualities, even while anchoring the immersive experience in the Immersant's living breathing body.

Gaze, as focused attention and Inter-responsivity

I now want to explain yet another aspect of the interface in *Ephémère*, involving our use of gaze. In order to contextualize my comments, I ask the reader to recall my discussion in Chapters I and II on the cultural bias in modern visuality – as the privileging of a disembodied, distanced and dominating subject – and its reinforcement by conventional 3-D computer imaging techniques;⁴⁹ as well as my discussion in context of Heidegger, of technological thinking as a challenging and enframing the world as standing-reserve.⁵⁰

⁴⁶ Summers, 683, defines cardinality as "The specific *conditions* of individual human real spatiality, defined by uprightness, size, facing, capacities for movements and actions". 683. In this context, Panofsky's ideas about the structure of psychophysiological space (quoted in my Chapter III, footnote #100) are also relevant regarding the *non-homogeneity* of subjectively-experienced "perceptual space" in comparison to the homogeneity of computer-generated geometric space: Panofsky, for example, quotes Ernst Cassirer, from *Philosophy of Symbolic Forms*, "Visual space and tactical space [*tastraum*] are both anisotropic and unhomogeneous in contrast to the metric space of Euclidean geometry: 'the main directions of organization – before-behind, above-below, right-left – are dissimilar in both [as visual and tactical] physiological spaces'". Panofsky, *Perspective as Symbolic Form*, 30.

⁴⁷ Merleau-Ponty, "Eye and Mind", 178.

⁴⁸ Merleau-Ponty, *Phenomenology of Perception*, 138-139. Emphasis mine.

⁴⁹ I am referring here to my discussion in Chapter I, 1.1, *The cultural bias in 3-D computer imaging techniques* and its footnotes, of critiques of modern visuality and Cartesian perspective as expressed by Coyne, Evernden, Foster, Irigaray, Jay, Lefebvre, Tikka, et al. Also, in this context, see my discussion on "seeing from a distance" in Chapter II, 3.2, *Landscape, as representation*.

⁵⁰ See Chapter I, 2.1, *The essence of technology*.

Accordingly, when I first began considering gaze as a possible interface modality in 1993, I qualified: "Not the voyeuristic gaze – a gaze that measures and surveys, but rather a gaze that drinks in ecstatically, a gaze that seeks union".⁵¹ And, in the earliest *Ephémère* working notes, I wrote more specifically that "Gaze, as a means of evoking response, could create change all around the Immersant. This approach supports the 'perceptual relativity' and 'inter-responsivity' that I have wanted for this work ... gaze – as focused attention – to reveal another dimension/level of activity in the environment, opening..."⁵² Thus, in the completed work, if the Immersant goes near certain elements (which, in turn, have been watching out for the Immersant) and attentively gazes upon them for certain amount of time, they will "open" in response, "revealing" interior spatial realms.

This interactive dynamic – of gazing and being gazed upon – could be interpreted in context of Merleau-Ponty's intertwining of multiple perceivers and perceived,⁵³ (as in Drew Leder's entwining of perspectives in "mutual validation",⁵⁴ and David Abram's "perceptual reciprocity"⁵⁵), which I have already discussed in Chapter II. As evidenced by the *Ephémère* working notes however, I was not only approaching this in terms of what (at the time) I called "perceptual relativity", but also "inter-responsivity". What I meant by this was rather than staring *willfully* to make things happen (from an attitude of challenging-forth and ordering⁵⁶), our use of gaze was intended to serve as a means of inviting or evoking response from certain elements, which are already watching the Immersant. Thus, there is an aspect of reciprocity involved, at least metaphorically, for when gazed upon and approached (but not touched or manipulated), such elements will "reveal" previously hidden interior aspects of themselves to the Immersant, before withdrawing into non-visibility, if, for example, the Immersant looks away.⁵⁷

Interpreted through concepts introduced in Chapter I, this dynamic involves rewarding the Immersant's attitude of sensitive attention (as in *Gelassenheit*) with a doubled "revealing", in terms of *poiesis* as in bringing-forth from concealment into unconcealment. I mean this in the sense of *poiesis* as a poetic or metaphorical bringing-into-appearance (through *poiesis* as *techne*) of *poiesis* in its highest sense, as *physis* (nature) defined by Heidegger as an "arising of something from out of itself" as in the "bursting of a blossom into bloom, in itself".⁵⁸ For example, in *Ephémère*, the

⁵¹ See the "Osmose white paper", excerpted in Chapter IV.

⁵² See *Ephémère* working notes, dated Sept 26, 1996, excerpted in Chapter V.

⁵³ See my entire discussion regarding Merleau-Ponty in Chapter II, 5.5, *The "intertwining" of perceiver(s) and perceived*: In particular, Merleau-Ponty's comments, from "Eye and Mind" (p.160), that "associated bodies must be brought forward along with my body"... "the 'others' along with whom I haunt a single, present and actual Being..."; and also my footnoted reference to his statement that "The flesh of the world is of the Being-seen, i.e., is a Being that is *eminently percipi*", from *The Visible and the Invisible*, 250.

⁵⁴ Leder, *The Absent Body*, 63-64. I have already quoted Leder in this context in Chapter II, section 5.5. His entire sentence reads as follows: "Our perspectives on the world, though never quite coinciding, intertwine in mutual validation [whereby] the reality of the world is secured via its presence to *other* perspectives than my own".

⁵⁵ David Abram, *The Spell of the Sensuous: Perception and Language in a More-Than-Human World*, 56. I have quoted this phrase by Abram in Chapter III, I.I, "Seeing which is not seeing".

⁵⁶ I use these terms, which could also include controlling, manipulating, dominating, etc., in context of Heidegger's description of instrumental thinking, as described in Chapter I.

⁵⁷ There are intriguing unexplored implications here related to Merleau-Ponty's understanding of the invisible, such as when he suggests "The invisible is *there* without being an *object*, it is pure transcendence, without an ontic mask". *The Visible and the Invisible*, (Working Notes), 229.

⁵⁸ I discuss such doubling of *poiesis* – whereby *techne* is employed not to manipulate or control but as *poiesis*, to artistically, metaphorically *reveal* the *revealing* – in Chapter I, 2.2, *Techne as poiesis*. This phrase from Heidegger (in "The Question concerning Technology", p.10) is quoted in

Seeds in the Under-Earth will "signal" their receptivity by flickering, and then, in response to the immersant's proximity and gaze, will begin to "germinate", whereby the Immersant can, if she is sufficiently skilled, float into their swelling interiors and remain within their luminous "blooming", before they perish.⁵⁹ Similarly, Boulders in the Winter Swamp or Forest Landscape, when approached and gazed upon, will reveal "interior landscapes" which expand to envelop the Immersant in translucent veils before fading. This happens not only visually but aurally, intended as a metaphor for the transformations that can take place when one is engaged in focused attention through contemplation (whether in actual or, as in *Ephémère*, in virtual space).

Such inter-responsivity, of course, is completely missed by Immersants who pass through the work quickly. Even if they experience a kinesthetic thrill from racing around, there is much more to be gained, in terms of the work's subtleties, through attentive perception, slowness and bodily self-control. In this context, I want to emphasize that the practice of gaze in *Ephémère* is a necessarily physical yet self-collected activity, issuing as it does from a lively and instable body. (I say this in context of my intent to affirm the subjective embodiedness of the immersant as an alternative to conventional approaches to representation, based on, as Norman Bryson suggests in *Vision and Painting: the Logic of the Gaze*, the disappearance of the viewer's body.⁶⁰)

context of my preceding discussion of *physis* in Chapter I, 2.1, *The essence of technology*. I want to remind the reader that in *Ephémère*, such "blooming" of the seed was not an illustration of Heidegger's example, but was already a recurring element in my work – and as such, could itself be considered an example of *poiesis*, in terms of such Imagery arising or manifesting of-its-own-accord from a poetic "wellspring", as I have suggested at the beginning of the *Ephémère* working notes.

⁵⁹ The following is John Harrison's technical description, as a software engineer, in relation to gaze and Seed: "Each object in *Ephémère* is running a program, so each object *can be aware* of what the Immersant is doing. If the Immersant gazes at an object [which is calculated according to the rotational position/direction of the Immersant's head, rather than eye-tracking] the object *knows* it is being watched, and starts a timer: If the Immersant continues to look at the object for a pre-specified time (which can be different for each object, but is usually a second or two), the object can then start a behaviour. So, for example, if the Immersant gazes at a seed, the seed becomes aware that the Immersant is looking at it. After the Immersant watches for the Seed for couple of seconds, the Seed will begin its behaviour, which is to start growing. Once the Immersant looks away from the Seed, its behaviour ends, and the seed converts itself to a 2D texture image of itself (for graphics efficiency.) All of this is controlled by the program running in the Seed: as the program runs, the Seed can add detail to itself, such as its spinning veils and growing shoots/roots to suggest growth, and eventually replace itself with the 2D image of a grown seed."

⁶⁰ I want to point out that my use of the word "gaze" is *not* intended in the same sense as Norman Bryson's, who writes in *Vision and Painting: the Logic of the Gaze* of the "Implied dualism of the Gaze and the Glance". Accordingly he explains, "Painting of the glance addresses vision in the durational temporality of the viewing subject; it does not seek to bracket out the process of viewing...." In comparison, "the gaze of the [Western] painter arrests the flux of phenomena, contemplates the visual field from a vantage-point outside the mobility of duration, in an internal moment of disclosed presence...." 94. Next to his text are my own notes, written in the margin of his essay more than a decade ago (before I had begun working in Immersive virtual space): "*I do not want to arrest the flux of phenomena but enter into the duration of that flux*".

Bryson goes on to describe the corporeal, spasmodic vibrancy of flux characteristic of embodied vision. 95. He also explains, in the context of Western representational painting (compared to early Chinese landscapes, such as the Ch'an paintings he discusses in context of the withdrawal of the frame – discussed in my footnote #9 in this chapter – which incorporate temporality and flux) that "The logic of the Gaze is therefore subject to two great laws: the body (of the painter, of the viewer) is reduced to a single point, the *macula* of the retinal surface; and the moment of the Gaze (for the painter, for the viewer) is placed *outside* duration. Spatially and temporally, the act of viewing is constructed [in Western painting] as the removal of the dimensions of space and time, as the disappearance of the body...." 96. Considered in this context, *I would say that my entire artistic endeavour of the past two decades has consisted of attempting to undo these two great laws; in my*

For example, in the case of *Ephémère's* Boulders and Seeds, the Immersant must carefully manage her own breath and balance to approach a particular element, and then "hover"⁶¹ at close proximity (remaining relatively motionless while spatially suspended, i.e., without floating up or sinking down) – all the while steadily focusing her attention upon it. Once the element has responded by "opening", the Immersant must then further maneuver through breath and balance – in order to either remain within the boulder's expanding interior landscape or float into the seed during its brief transformation. (If she happens to look away while within their flowing sphericity, such effects will vanish. Or, a seed may flicker in response to the immersant's gaze, and proceed through its process of blooming – only to fade before the Immersant can bodily reach it...)

"Gazing" thus involves a combination of activity *and* non-activity on the part of the immersant, requiring not only proprioceptive skill in terms of interior body awareness, but also of looking steadily in a particular direction, adjusting the amount of air in her lungs, holding her position while crouching, and so on, all the while paradoxically situated in two spaces, or places, the actual and the virtual, at the same time.

Here again I will use a diving analogy, of buoyancy control, whereby maintaining one's "neutral buoyancy" underwater (and being able to hang in "mid-space" while absolutely still, without rising up or floating down) takes a surprising amount of practice and very subtle skill, involving both breath and balance: Most interestingly, the *only* time I have ever managed to achieve such neutrality perfectly (while suspended 50 feet below the ocean surface, remaining completely passive, as my body – out of its own inherent balance – slowly rotated and tilted into a horizontal lying position, even while I was floating as if in mid-air), involved a strange kind of mental and physical surrender or "letting go" – a calm yet euphoric sensation which lasted only a few moments, because as soon as I became self-conscious of what I was successfully (and thrill-fully) achieving, I immediately "fell" out of position and began to literally float away. Such experience (of literally *letting-go*) seems resonant with Heidegger's notion of "releasement", of letting-be...

"Letting-be" (Gelassenheit)

Returning to my discussion of gaze, Levin writes that "The ideal of *Gelassenheit* calls for a gaze which is relaxed, playful, gentle, caring; ... a gaze which is alive with awareness; a gaze at peace with its self, not moved, at the deepest level of its motivation, by anxiety, phobia, defensiveness and aggression...."⁶² Such tranquility, he suggests, "depends on steadiness, on relaxation – a distinctive modalization of the tensions inherent in intentionality, [a modalization which] depends, in turn, on 'circumspection'..."; and, as he further specifies, "In the achievement of *Gelassenheit*, the gaze would move with a motility grounded in a deep sense of serenity. It would not be moved

virtual environments, I have attempted to experientially re-immersant the viewer in enveloping space and in flowing time, grounded in her own living, fluxing, breathing body.

⁶¹ I have been using the word "hover" for probably a decade to describe the proprioceptive skills necessary to fully experience "floating" through *Osmose* (and more recently *Ephémère*). Just recently, i.e., autumn 2004, I read the following statement by Levin, in *The Opening of Vision: Nihilism and the Postmodern Situation*, whereby he writes "But the gaze which is tightly enframed will be incapable of the *gentle, hovering, balanced attention*, and the playfulness, which would elicit that aspect [of meaningful depths] of the visual field". 68. (Emphasis mine.) His statement resonates very evocatively with my attempts to dis-enframe vision.

⁶² Levin, *The Opening of Vision: Nihilism and the Postmodern Situation*, 238.

by a need for violence".⁶³ Such letting-be, he explains, "is neither a 'cold', theoretically disinterested staring-at, nor a looking-at totally possessed by instrumental calculations [but rather] an interested looking which cares; it is a being-with which cares; it is a response-ability to the presencing of Being which lets it come forth, lets it be present, *without* needing to master and dominate its presence".⁶⁴ As such, Levin writes, "Letting-be ... constitutes a *radically different relationship* with beings".⁶⁵

In this context, I want to emphasize that in conceptualizing a user-interface integrating breath and balance with gaze, I have sought to develop an alternative to conventional hand-based modes of interaction (keyboards, dials, pointers, joysticks, steering wheels, data gloves, etc.) which not only deny the participant's presence as a wholly embodied subject, but also reinforce a controlling and manipulative (as in "manual") stance towards the world.⁶⁶ In doing so, I have deliberately attempted to shift the metaphors associated with *Inter-activity* to *Inter-relationship* – as in the already discussed "perceptual relativity" and "Inter-responsivity" – whereby the interface is intended to serve not as a channel for "control" but rather "communion"; and the immersive experience is not about "doing" but "being". Accordingly in *Ephémère*, instead of acting willfully upon the world in order to change it (doing-this-to-that-to-make-that-happen),⁶⁷ the goal is to give up such goals, and surrender to its flux and flows...⁶⁸

Here again, I will refer to insights gained from scuba diving, whereby not only are new divers encouraged to slow down and pay attention, but also, to keep their hands behind their backs – because "handling" underwater creatures can cause mutual harm. As a result, diving becomes an essentially contemplative *non-activity*, involving care-full and patient behaviour (as in quietly *waiting* for extended periods of time, while hovering motionlessly and in close proximity, for some shy and highly-sensitive creature to emerge from its hidden abode.) In this context, such "letting-be" can literally be interpreted as approaching the world with tact, proposed earlier by Verena Conley as a first step towards "developing an ecological rapport".⁶⁹

⁶³ Ibid.

⁶⁴ Ibid., 244-245. As Levin explains, "Normal perception, the optical perception of anyone-and-everyone, is inveterately grasping, as the very word itself should remind us. It is an anxiety-driven, restless intentionality.... But such perception cannot see the whole of things, because wholeness, unlike totality, is not something that can be grasped. In *Being and Time*, Heidegger points out that 'Letting something be encountered is primarily circumspective; it is not just sensing something, or staring at it [but] implies circumspective concern, and has the character of becoming affected in some way...'. [176]. 'Circumspective concern' characterizes a vision, a gaze, which is deeply affected by – which allows itself to be affected by – the presencing of the visionary field as a whole: a gaze whose global character as panoramic caring lets that field to be present in its wholeness. A gaze moved by 'circumspective concern' is a vision in touch with its *felt* sense of the visionary field, whose primordial wholeness it embraces through its inherent ontological attunement". 234-235.

⁶⁵ Ibid., 244.

⁶⁶ See my critique of conventional modes of interaction in Chapter I, 1.1, *The cultural bias in 3-D computer imaging techniques*; and also my discussion of Heidegger's concept of *techne* as Enframing, as a challenging-forth or commanding, in Chapter I, 2.1, *The essence of technology*.

⁶⁷ Regarding "acting upon things in order to change them", I am referring to notions of interactivity discussed in context of the "virtual" in Chapter II.

⁶⁸ Several years ago I was approached by a corporation interested in redesigning *Osmost* or *Ephémère* as a commercial game, whereby the interface would have been a conventional gaming console, without using a stereoscopic HMD or breath & balance interface. I emphatically declined such an offer, because repurposing these works without their spatially-enveloping quality and grounding in the body, would be to miss the point of these works entirely, and in doing so would negate everything I have attempted to achieve.

⁶⁹ Discussed in Chapter I, 2.2, *Techne as poiesis*. Conley, "Eco-Subjects", 79.

I want to pause for a moment to explain why I keep referring to diving. In Chapter II, I quoted Bachelard who suggests that places like the deep sea can be psychically-innovating because they are *unlike* the environments to which we are habitually accustomed: In this context he cites Philippe Diolé, who says to "go down into the water or into the desert is to *change space*".⁷⁰

Indeed, while diving I have had astonishing perceptual experiences, which have significantly informed my non-conventional understanding of Immersive virtual space.⁷¹ In general, while diving, the sensations of floating, without desiring to control things, combined with deep and rhythmic breathing over a silent and solitary hour, can cause a dramatic shift from habitual goal-oriented, activity-based behaviour to a more gentle, receptive state of being. Such transformation can indeed be interpreted in terms of *Gelassenheit*, particularly when considered through Richard Coyne's account (quoted in Chapter I, 2.2, *Techne as poiesis*) of *Gelassenheit* as an attitude whereby we learn to "encounter things – in their essence and in their mystery",⁷² approaching creatures not as objects to be manipulated for human gain, but out of respect for their mysterious processes of being and becoming.⁷³ Such surrender of the ego-self (already mentioned in context of Drew Leder's discussion of breath and Zen/Taoist *wu-wei* or "non-action", as "effortless acting typical of one who has broken free from ego-identification"⁷⁴), could well be what Diolé was referring to when he suggests that one who is familiar with the deep sea can never be like others again.⁷⁵

⁷⁰ See my discussion in Chapter II, 2.5, *Immersive virtual space as a means of transforming perception*. Bachelard, *The Poetics of Space*, 206. Philippe Diolé (from *Le plus beau desert du monde*, 118) in Bachelard, 207.

⁷¹ Diving introduced me to an experience of space which is vastly different from our habitual experience as terrestrial beings, i.e., of space experienced as voluminous and *full*, pressing close upon the skin, sensually enveloping. And even though at depth, the ocean takes on a quality of pure limitless space, *at the same time*, because of its all-encompassing fluidity, it feels interior, embryonic. And as mentioned earlier, divers do not walk or drive or manipulate joysticks, but *float*, using subtleties of breath and balance to control their buoyancy, ascend and descend, or hover motionlessly, hands-free, without seeking to control or manipulate the creatures around them.

Also, while diving, I have had experiences involving startling ego-boundary dissolution: For example, once while floating over a blue hole, ascending between alternating layers of cold white cobweb-like algae and warm ochre gas-clouds with no earthly reference at all, for several moments I lost all sense of *what* I was: whether I was incomprehensibly floating *inside* my own brain, had been ingested a hallucinogenic substance, or had actually, inexplicably, been transformed into a flying bird. So strange was this experience that I became quite alarmed: as a result all my attention was redirected, away from the diving activity, to intensely *questioning* my perceptions.

Similarly another experience, had while floating a hundred feet below the ocean surface over a six thousand foot abyss, where there were no external visual references except a single horizontal cable-line: here, while gazing into the endless enveloping blue (at this depth, the sea does not feel like water but viscously enveloping space) where there was nothing to look at (i.e., "no things"), I saw a luminous speck passing by – but could not distinguish whether it was the brightly flashing body of a distant barracuda or shark, a tiny translucent jellyfish only inches away, or a rod misfiring *inside* the retina of my own eye. This *confusion*, this perceptual and conceptual *slippage* – whereby the usual boundaries between near and far, subject and object, as well as inside and out, disappeared – left me spellbound in the true sense of the phrase, for I effectively entered into some kind of altered mental state which lasted for some time afterwards.

⁷² Coyne, *Designing Information Technology in the Postmodern Age: Method to Metaphor*, 144.

⁷³ *Ibid.*, 66.

⁷⁴ Leder, *The Absent Body*, 171. Similarly, Steve Odin writes in *Process Metaphysics and Hua-Yen Buddhism*, that "...*Gelassenheit* as letting-be (through not-willing), in the sense of ancient Taoist *wu-wei* as non-interference or non-action, means to "let beings be as the beings which they are", by allowing them the freedom to show themselves as unhidden phenomenon through exfoliation into overtness and revealment in the open-dimension of Being, which is itself the dimension of primordial truth as *aletheia* or nonconcealment". 42.

⁷⁵ Diolé, in Bachelard, 207.

As I have experienced diving, one's awareness can also shift beyond the "things" in one's frontal vision, to an awareness of the entire environmental surround – of the sea itself – as a field of possibilities *all around*. Most recently, I have come to see a relation between such experience, and *Gelassenheit* – as a shifting of awareness away from the world of objects to an awareness of the *field* the objects are within – and as an awareness of the enveloping *horizon* as an "openness" which, to quote Heidegger directly, "comes to meet us"...⁷⁶ This phenomenon (which would include my experience of *expanding to become the horizon* in the field) is described by Steve Odin as a "shift of attention or widening of focus from determinant form to its surrounding field or horizon of openness", characteristic of the *sunyata* experience of perceptual awareness.⁷⁷ In this context, he suggests Husserl's notion of horizons-perception, in which "Every experience has its horizon; every experience has its core", is a *corrective to our habitual perception* of "mere focal actualities" seen in isolation from "their contextual location within a co-present margin or peripheral background".⁷⁸

As Odin further explains, "This concept of *noetic* reversal from core to horizon is precisely what in Heidegger's descriptive phenomenology is called *Gelassenheit*, i.e., 'letting-be' or 'releasement'", whereby, in Heidegger's own words, "*Gelassenheit* means 'to release oneself into the openness'".⁷⁹ As already suggested in Chapter I, Odin also points out that Heidegger developed the phrase *Gelassenheit* from the mysticism of Meister Eckhart, wherein it assumed the meaning of 'non-attachment': As such, Odin writes, "the non-attached and non-focal mode of perceptual awareness achieved through *Gelassenheit* exhibits an especially close proximity to Buddhist *prajna*, in which perception of openness (*sunyata*) through nonattachment to dharmas is the basis of enlightened experience and liberated vision".⁸⁰

⁷⁶ See my discussion in Chapter I, 2.2, *Techne as poiesis*, in which I quoted Scheibler, "Heidegger and the Rhetoric of Submission: Technology and Passivity", 128-129; and Anderson, Introduction to Heidegger's *Discourse on Thinking*, 24; and Heidegger, "Conversation on a Country Path", 64-65.

⁷⁷ Steve Odin, *Process Metaphysics and Hua-Yen Buddhism*, 37. Note that the "field of *sunyata*" has been referred to earlier in this chapter (footnote #9) in context of Bryson's discussion of Nishitani in "The Gaze in the Expanded Field", 100; and also in Chapter II, 4.2, (footnote #208) in context of Nishitani's own discussion of nature (*physis*) from *Religion and Nothingness*, 149.

⁷⁸ Odin writes that "It is precisely this notion of a co-present horizon surrounding the focal core of the perceptual field which was subsequently termed the 'Region of Openness' in the descriptive phenomenologies of Heidegger and Merleau-Ponty. For instance, in his famed *Gelassenheit* [*Discourse on Thinking*] essay, Heidegger articulates the notion about horizon as a peripheral phenomenon 'which encircles the view of a thing – the field of vision ... we look into the horizon. Therefore the field of vision is something open, but its openness is not due to our looking.' In such a manner then, the Husserlian phenomenological datum of a horizons-phenomenon designates the open-dimension of the perceptual field". 36.

Odin continues: "According to the phenomenological hermeneutic of Buddhism pioneered by [Herbert V.] Guenther, the traditional Buddhist form/emptiness (Skt. *rupam/sunyata*) distinction is not simply an abstract metaphysical formula, but is a literal descriptive profile of the core/horizon, foreground/background or centre/openness gestalt ratio characterizing the perceptual field of global presence. Thus, whereas 'determinate form' (*rupam*) signifies the foreground or focal core of the perceptual field, 'emptiness' or 'openness' (*sunyata*) signifies its background as peripheral horizon. ... Consequently, the traditional Buddhist dictum concerning the indivisibility of form and emptiness is retranslated by Guenther into the descriptive proposition that 'openness is present in and actually presupposed by every determinate form'". (Ibid.) Odin further quotes Guenther as follows: "*Sunyata* [openness] can be explained in a very simple way. When we perceive, we usually attend to the delimited 'forms' of objects. But these objects are perceived within a 'field'. Attention can be directed either to the concrete, limited forms or to the field in which these forms are situated. In the *sunyata* experience, the attention is on the field rather than on its contents'." 37.

⁷⁹ Ibid., 38.

⁸⁰ Ibid., 39.

4. The Visuals

I cannot emphasize enough the importance of semi-transparency in my approach to Immersive virtual space. While others have commented extensively on our development of the breath/balance interface, no one has adequately understood the significance of transparency in my work, even though I have publicly been referring to this for more than a decade.⁸¹ As I have explained in Chapter III when describing the emergence of my key concerns in painting, my earliest use of semi-transparency originated in an intuitive desire to go beyond the surface appearances of things and collapse boundaries between objects and space; and ultimately, dissolve the distinction between subject-self and object-world.⁸² When I began working with 3-D digital imaging technology in the late 80's, my prior use of transparency became a means of necessarily subverting the technology's conventions of objective realism, Cartesian space and artificial perspective – all of which reinforce the very dualist/objectifying worldview I had been attempting to dismantle. Since I have written about this in earlier chapters,⁸³ I will not repeat myself here, but instead focus on the significance of combining semi-transparency with transformation, and the attendant effects of ambiguity, in context of the dynamics of immersion in *Ephémère*.

Semi-transparency and transformation, as *physis*

While an Immersant is experiencing *Ephémère*, everything she sees in the surrounding environment is semi-transparent. Accordingly, as she changes her spatial location and point-of-view within the scene, there is a continually transforming interrelationship between herself and the various three-dimensional elements (with their attendant translucencies, tonalities, hues and textures) around her. This fluxing interrelationship becomes all the more complex because she is able to see *through* a depth of up to 40 semi-transparent surfaces simultaneously.⁸⁴ The intended experiential effect is that form and space seem fluidly intermingled, and no element appears apart, but is interfused with every other. I had first attempted to achieve this through painting in the mid 80's, in terms suggesting not only disparate things but hitherto dualistically separate "spaces" (such as interior flesh and exterior landscape) coexisting by occupying *the same place at the same time*.⁸⁵

⁸¹ My earliest public lecture dealing with semi-transparency was presented in 1993, ("Painting in Virtual Space: Towards an Alternative Aesthetic", 4th International Symposium on Electronic Art, Minneapolis, USA).

⁸² See Chapter III, 2.2, *Going beyond objects and surface*, and 2.6, *Interlacing space: the "intertwining" of interior, exterior, self and world*.

⁸³ See Chapter III, 3.3, *The transitional images: creating on the other side of the picture plane*; Chapter IV, 2.1, *The Osmose white paper*; and Chapter V, 1.1, *The Ephémère working notes*.

⁸⁴ I want to emphasize that I am not speaking of superimposition (in digital terms, "compositing") of two-dimensional surfaces or polygonal 3D models. See my discussion in Chapter III, 3.3, *The transitional images: creating on the other side of the picture plane*. According to our calculations, in *Ephémère* it is possible to see through a depth of up to 40 semi-transparent "surfaces" simultaneously (e.g., through twenty three-dimensional forms, each with an anterior and posterior surface); and 20 such "surfaces" in *Osmose*. This was why we needed a computer with powerful graphics processing capability – because we were rendering this in *real time*. As the last of the *Ephémère* working notes show, we had a huge problem with rendering frame-rates even on a high-end Silicon Graphics Onyx computer, necessitating the unfortunate removal of numerous elements so that the frames would render fast enough to provide a sense of real-time immersion without lag. Now, this might not be a problem, as the PC that both works currently run on is much faster than the SGI. It is, of course, too late to return to the work and put such elements back in.

⁸⁵ See Chapter III, 2.6, *Interlacing space: the "intertwining" of interior, exterior, self and world*.

Such spatial complexity is dramatically increased in *Ephémère* (unlike in *Osmose*) by the fact that all the semi-transparent elements are engaged in transformation. The reader should note that I am not referring here to the mere movement, or animation, of elements within the scene, but rather – and this is crucial to the entire meaning of *Ephémère* (and accordingly, its title) – all elements are variously emerging into being, lingering, and passing away. This metaphorical “presencing” or “coming-forth from concealment into unconcealment” takes place very much in the sense of Heidegger’s *physis*, manifested here through semi-transparency: i.e., each element “arises” from 100% transparency and transforms over a range (of visibility) up to and including near (but never total) opacity, and then withdraws into non-visibility. Furthermore, in *Ephémère*, a myriad of elements are doing this simultaneously, all at their own paces and rhythms and over various durations – while accordingly, the Immersant is able to see *through* all of them, as well as engage some of them in further “revealing” through reciprocal gaze and inter-responsivity.

In this context, I want to mention two aspects of *physis* which might not have been evident in my earlier definitions of the word. As Michael Harr (who I want to quote here, especially because I was reading his concept of *physis* while conceptualizing *Ephémère*) explains, Heidegger – “In identifying Heraclitus’ *physis* with *aletheia*, in retranslating Heraclitus’ famous Fragment 123, *physis kryptesthai philei* (‘nature loves to hide itself’), and interpreting *physis* as ‘what arises favours self-concealing’ – is suggesting that the essence of *physis* is *aletheia*.⁸⁶ (I have already defined *aletheia* as “revealing” in Chapter I, and have referred to it in this chapter, when discussing gaze.) As I interpret and necessarily simplify Harr’s explanation, the significance of this is that for Heidegger, *physis* involves a kind of “interior life, or elementary pulsation”, which occurs according to a “simultaneity of showing-itself and self-withdrawal”: Such withdrawal is not simply a “hidden dimension ... but a true reserve that ‘feeds’, so to speak, emergence”.⁸⁷ In this context, Harr explains, “One must understand that the withdrawal contains the ‘essential possibility of emergence’, which means preserves it, protects it, maintains it, [and therefore] there is no nature without potentiality, without reserve...”.⁸⁸

Furthermore, Harr suggests, the second internal trait of *physis* is that of “favour”, as a gift, as “the very play of arising and withdrawal”, and as such, it is “the marvel as well as the enigma of the ‘there is’”.⁸⁹ This notion of “favour” seems suggestively related to Scheibler’s account of

⁸⁶ Michael Harr, *The Song of the Earth: Heidegger and the Grounds of the History of Being*, 49. (Underline mine.) I have quoted Harr’s reference to Heidegger’s definition of *physis* twice earlier, from *Heraklit* (but note, here Harr provides a slightly different version than his p. 8 version that I have cited previously, using “arising” instead of “blooming”): “In truth, other than the specific connotation of mountains, sea, and animals, *physis* signifies the pure arising (*des reine Aufgehen*) in the power of which all that appears appears and thus ‘is’”. 50. In this context, Harr explains that while the word *physis* may intuitively suggest images of vegetal growth, the “...pure blooming of *physis* does not need these ontic models and images. It is anterior to them as the condition of their appearance.” Ibid.

⁸⁷ Ibid.

⁸⁸ Ibid., 50-51.

⁸⁹ Ibid., 51. Harr’s statement, in greater length (but still excerpted), reads, “The second and most important internal trait of *physis*, comes to light in the word that translates *philei*; ‘dispense favor’ (*Gunst*). Blooming favors withdrawal. ... Favor is the freest gift that occurs as a moment of grace. ... Thought of as the essence of *physis*, favor does not signify any being or thing but rather the very play of arising and withdrawal ... [whereby that which emerges does so] only from a return into itself and from a saving, from the deep shelter where what does not spring forth collects itself – such is the marvel as well as the enigma of the ‘there is’”. 51.

Heidegger's *Gelassenheit*, discussed in Chapter I, as a kind of waiting in *gratitude*.⁹⁰ There seems to be an implied reciprocity here, between favour and gratitude, involving as Scheibler explains, a kind of "thanking" as if given a gift, an attitude towards nature based on respect, not only for its emergence but its self-withdrawal, which differs dramatically from our culture's calculative-instrumental approach, ordering it forth as standing-reserve.⁹¹ As such this notion can also be applied to my earlier discussion of gaze and revealing, as inter-responsivity, in *Ephémère*.

Semi-transparency and transformation, as "mobile continuum"

Meanwhile, for the Immersant, the effect of being within all of this coming-forth into appearance and passing away – enabled through semi-transparency and transformation – is as if she has entered into a realm in which everything is de-objectified and in flux, where discrete "things" have dissolved and figure/ground relationships⁹² are in constant play. Here, there are no duality of separate, static, bounded objects, and empty, isometric space. Instead, she will find herself inside a flowing and ebbing interpenetration of form and space,⁹³ a fluxing continuum, an enveloping field of transformation.

What I have just written here bears further explanation: First of all, I am not referring to an *optical* continuum in terms of the perceiver's visual field, nor the "quantum continuum" of Panofsky,⁹⁴ but rather to something altogether different. My use of the words "continuum" and "field of transformation" in this context dates back to the 1993 *Osmose* white paper – when I first referred to Nishitani's efforts (as described in Bryson's "The Gaze in the Expanded Field") to dismantle the Cartesian anthropocentric subject-*cogito* which "conceives itself as universal center, surrounded by the stable plenitude of an object world", whereby objects manifest as "separate entities" with permanent form and stable locations.⁹⁵

⁹⁰ Scheibler, "Heidegger and the Rhetoric of Submission: Technology and Passivity", 128.

⁹¹ Ibid.

⁹² According to Levin, in *The Opening of Vision*, "If we want to understand the impact of [traditional Western] metaphysics on the historical character of our vision, then we must give thought to the being and presencing of the ground in our vision of *figure and ground*". 240. Emphasis mine. He goes on to say that, following Heidegger, "Our [traditional Western] metaphysics requires three things: (i) constancy of presence, (ii) permanence of presence, and (iii) fixity or rigidity of presence." 240-241. In comparison he suggests, "If the vision of *Gelassenheit* is a vision no longer stuck within our historical 'metaphysics of presence', we may suppose, *a fortiori*, that it engages a vision which no longer finds itself compelled to experience the presencing (*Anwesenheit*) of Being with a need to require, and impose upon it, the metaphysical conditions of constancy, permanence, and fixity". 241. *Gelassenheit* can thus be vision which is open to a different "response-ability, to the presencing of Being". Ibid. There are interesting parallels between Levin's comments above and Bryson's following comments from "The Gaze in the Expanded Field", quoted below in footnote #95.

⁹³ I want to remind the reader of Steve Odin's earlier reference, contained in my footnote #78, to the foreground/background, core/horizon or centre/openness gestalt in terms of the traditional Buddhist form/emptiness (Skt. *rupam/sunyata*) distinction as developed by Guenther: whereby 'determinate form' signifies the foreground or focal core of the perceptual field, and 'emptiness' or 'openness' signifies the background or peripheral horizon. And further, it bears repeating Odin's comment here regarding Guenther's retranslation of the Buddhist dictum concerning "the indivisibility of form and emptiness" into the proposition that "openness is present in and actually presupposed by every determinate form". (Odin, *Process Metaphysics and Hua-Yen Buddhism: A Critical Study of Cumulative Penetration vs Interpenetration*, 36)

⁹⁴ Panofsky, *Perspective As Symbolic Form*, 31; 42-44.

⁹⁵ Bryson, in "The Gaze in the Expanded Field", 96-101, compares Nishitani's critique (*Religion and Nothingness*) of the "Cartesian self-enclosure of the *cogito*" with Sartre's *Being and*

As I quoted in the *Osmose* white paper, by Bryson's account, what we habitually conceive as an "object" - i.e., a stable entity with bounded outline - is preserved only by an optic that casts "a perceptual frame" around each entity, *cutting* it from the "universal field of transformations"; - and when that frame is withdrawn, "the object is found to exist as part of a mobile continuum that cannot be cut anywhere".⁹⁶ Thus, to use Bryson's example, a flower is only "a *phase* of incremental transformations between seed and dust: at no point does the object come under arrest that would be mobilize it as form or eidos"; and as such, it does not occupy a single location, nor achieve separation from the field of transformations or acquire a bounded outline.⁹⁷ Even though I had wanted to deal with this concept in *Osmose*, as explained at the end of Chapter IV, we did not succeed: Accordingly, in 1996 when beginning to think of the following work, I wrote directly into the margin of Bryson's text, "What if that world [i.e., the virtual realm] was in flux? What if the objects were not separate entities, were not stable or enduring?" I have attempted to achieve this in *Ephémère*, as explained above, through semi-transparency combined with transformation.

As for the perceiving subject as Cartesian *cogito* independent or separate from the objects around it - with its position, as Bryson writes, "of universal center, around which the object world clusters or converges as the subject's experiential horizon"⁹⁸ - this too I have attempted to disable, not only by dismantling hard-edged opaque objects through semi-transparency, but also through my own effort to collapse boundaries between perceiver and perceived. For in *Ephémère*, not only is the immersant able to see through all the transforming and semi-transparent elements around her, she can also (as I have explained elsewhere) effectively pass through everything, and most significantly in this context, reciprocally experience everything passing through herself as well (effectively, passing *through* her own retinas, especially in terms of *Ephémère's* veils of "flecks", which have their foundation in the "floating strokes" and "flecks" in my paintings, intended to suggest, as written in Chapter III, the "intertwining of the visible with the seeing".⁹⁹)

This not only recalls Klee's painterly comment on being penetrated by the universe;¹⁰⁰ but also Izutsu's description (discussed in context of my experience in the field, in Chapter II, 5.2) of the interpenetration of interior and exterior whereby the perceiving subject as "mind-and-body, has become completely *transparent*, having lost its existential opaqueness that would offer resistance to all things coming from the 'outside'",¹⁰¹ and whereby ultimately, there is no "interior" or "exterior",

Nothingness, which I referred to in Chapter III, footnote #97. In this context, Bryson describes the self as a "universal center" surrounded by the "stable plenitude of an object world", in which "subject and object exist in a state of mutual confirmation and fixity". Here, according to Bryson, the subject looks out from "its center amidst the world of things" and perceives objects as "separate entities" manifesting to the subject as having "(i) stable location in a single place; (ii) independent self-existence... ; (iii) permanent or enduring form". Similarly, the subject is assumed to exist (i) in one place only; (ii) independently, i.e. separate, from the objects around it; (iii) remain itself despite transformation in the material world; and also, unlike the objects in its world, (iv) have a "position of universal center, around which the object world clusters or converges as the subject's experiential horizon". 96-97.

⁹⁶ Ibid., 97.

⁹⁷ Ibid., 97-98.

⁹⁸ Ibid., 97.

⁹⁹ Jacques Taminiaux, "The Thinker and the Painter", 287, as quoted in my discussion of painting in Chapter III, 2.4, *Representing the embodied perceiver in enveloping space*.

¹⁰⁰ Merleau-Ponty, "Eye & Mind", 167. (He quotes André Marchand saying after Klee, "I think that the painter must be penetrated by the universe and not want to penetrate it...".)

¹⁰¹ Toshihiko Izutsu, *The Interior and Exterior in Zen Buddhism*, 19. Emphasis mine.

but only being, "all-transparent".¹⁰² Thus, in context of *Ephémère*, by using semi-transparency, I have attempted to collapse oppositional categories of interior and exterior, object and subject, so that they might be experienced as interpenetrating, occupying the same space at the same time.¹⁰³

However, as suggested in the *Ephémère* working notes (late October 1997), I was also seeking to conceptualize certain elements as having their own watchful "fields of awareness" and resistance to the Immersant, so that even if *transparent* to the Immersant's gaze, she cannot willfully enter their interiors unless they indicate their receptivity.¹⁰⁴ In this context, my intentions were aimed at offsetting the dominating, central and separate Cartesian subject with an alternative ecological understanding, whereby, as suggested by David Abram (quoted at greater length in Chapter II), the subjectively-perceiving body is conceived as our "insertion in the common, or intersubjective, field of experience"; and "our sensory perceptions [are] simply our part of a vast, interpenetrating webwork of perceptions and sensations borne by countless other bodies – supported, that is, not just by ourselves, but by icy streams ... owl wings ... and by the unseen, imperturbable wind".¹⁰⁵

Ambiguity, and the "open" work

The use of semi-transparency, in combination with the dynamics of my work, has more formal implications as well, related to ambiguity in terms of representation and viewer experience. As the Immersant moves within the virtual realm, and turns to view the ever-emerging or withdrawing, flowing and interfusing, of semi-transparent forms around her, the resulting fluctuation of figure/ground causes the contents of her visual field to continually coalesce into order and fall apart *simultaneously*. (The implications of which are discussed in the previous section, e.g., Ftnt #93.)

This effect is further amplified by my attempt to keep all representation within an elusive zone, between recognizable figuration and abstraction, with the intent of maintaining constant perceptual and cognitive ambiguity within the work.¹⁰⁶ I have already discussed such ambiguity in context of painting in Chapter III, 2.3, whereby I explained that its attainment was one of my greatest technical challenges, and remains so today, regardless of the medium.

¹⁰² Ibid., 36.

¹⁰³ In this context, the following comment by Odin also becomes quite interesting, given my earlier discussion of shifted awareness from determinant form to surrounding field: "The perception of core/horizon gestalt environments through phenomenological *Gelassenheit* as well as the envisionment of what *Hua-Yen Sutra* calls Buddha *ksetras* (fields), i.e., indivisible form/voidness, ... are both in full concordance with the matter/field or object/space model of reality operant in contemporary relativity and quantum physics. ... Thus, at the level of perception one can actually observe the solid surfaces and opaque boundaries defining physical objects become 'transparent outlines' which seem to dissipate into the surrounding openness of pure space, as is directly experienced in the Hua-Yen enlightenment experience of *li-shih-wu-ai*". 39-40.

¹⁰⁴ I want to mention an important issue here, in regards to my discussion of dissolution of boundaries and opacity. As I earlier quoted Val Plumwood in Chapter II, footnote #316, she suggests that "It is the *master* consciousness which presumes to violate boundaries and claims to subsume, penetrate and exhaust the other", and that therefore "Acknowledging the other's boundary and opacity of being is part of respect for the other". (Plumwood, *Feminism and the Mastery of Nature*, 178.) While in the context of my own work, I have attempted to develop an alternative to interaction which reinforces attitudes of mastery and domination, replacing this with notions of inter-responsivity and *Gelassenheit*, I have not had the opportunity to fully explore the implications of her comments in regards to opacity and the use of semi-transparency in my work.

¹⁰⁵ Abram, *Spell of the Sensuous: Perception of Language in a More-Than-Human World*, 44; 65.

¹⁰⁶ See my discussion in Chapter III, 2.3, *Evoking perceptual and cognitive ambiguity*.

According to Umberto Eco, in *The Open Work*, the "liminal situation" created by such ambiguity provides the "richest form of communication possible – richest because most open" he writes, while emphasizing the "delicate balance" required to maintain such order within disorder.¹⁰⁷ As he further explains, this balance involves a dialectic which opens the work to indeterminacy and suggestivity even while – and this is key – directing the viewer "toward a particular field of possibilities":¹⁰⁸ This, he explains, is what painters do in even their most casual creations.¹⁰⁹ Furthermore, when an artwork strives for *suggestiveness* (rather than literal illustration), it implicates the viewer much more deeply, inviting, as Eco says, the "full emotional and imaginative resources of the interpreter".¹¹⁰

Most significantly, what Eco calls the poetics of an open work "sets in motion a new cycle of relations between the artist and his audience, a new mechanics of aesthetic perception, a different status for the artistic product in contemporary society":¹¹¹ While Eco's comments are made in context of modern art, they could equally be applied to the interactive medium of virtual environments. As I have explained in Chapter II, an immersive virtual environment is by its very nature an "open" work, for there is no predetermined composition or narrative, other than the intentional "arc" or journey that the Immersant creates herself during her own motile exploration (which, especially in a work like *Ephémère* where everything is in transformation, is essentially unrepeatable): all the while of course, remaining within what Eco calls the artist's (as in my own) "intentional organization of its field of possibilities".¹¹²

Such openness is further amplified in works such as *Osmose* and *Ephémère* due to my use of semi-transparency, whereby there are no finite images since the Immersant can see through everything at all times. This spatial simultaneity (as I call it) combined with the Immersant's motility and fluidly changing point-of-view, resonates with Eco's description of a work by Dubuffet, where he quotes James Fitzsimmons that such "multiple vision is quite normal: this is how we really see things during a walk in the country, as we climb a hill or follow sinuous paths"; and further, "This tendency to view things from different spatial perspectives at the same time suggests that the same simultaneity is also possible with time".¹¹³

Eco also draws on modern psychology's and phenomenology's term "perceptive ambiguities" in reference to what he calls new cognitive positions which "allow the observer to conceive the world in a fresh dynamics of potentiality *before the fixative process of habit and familiarity* comes into play".¹¹⁴ This notion is very similar to that which I have already discussed in Chapter III, in regards to painterly (and poetic) seeing; and will return to at the end of this chapter.

¹⁰⁷ Umberto Eco, *The Open Work*, 98.

¹⁰⁸ *Ibid.*, 99.

¹⁰⁹ *Ibid.*

¹¹⁰ *Ibid.*, 9. Using the reading of poetry as an example, Eco writes of the process by which we try to "adapt our personal world to the emotional world proposed by the text", a process which is even truer of works that are based on suggestiveness, since such a work deliberately sets out to "stimulate the private world of the addressee so that he can draw from inside himself some deeper response that mirrors the subtler resonances underlying the text". Accordingly, he explains, the "reader" will be excited by the freedom of the work, by its "infinite potential for proliferation", and by its "inner wealth and the unconscious projections that it inspires". 91.

¹¹¹ *Ibid.*, 22-23.

¹¹² *Ibid.*, 100.

¹¹³ *Ibid.*, 91. Eco quotes James Fitzsimmons (*Jean Dubuffet*, Brussels, 1958, p. 43.)

¹¹⁴ *Ibid.*, 16. Emphasis mine.

The reader should note that here too, that the concept of the "open horizon" arises, as in Eco's citing of Husserl: "...perception itself includes horizons which encompass other perceptive possibilities, such as a person might experience by changing deliberately the direction of his perception, by turning his eyes one way instead of another, or by taking a step forward or sideways, and so forth";¹¹⁵ all of which becomes very relevant to an Immersant exploring within an ever-unfolding virtual landscape such as *Ephémère*.

In this context, Eco quotes Merleau-Ponty asking "How can anything ever *present itself* truly to us since its synthesis is never completed?"; and further, "How could I gain the experience of the world... since none of the views or perceptions I have of it can exhaust it and the horizons remain forever *open*?"; and most significantly to the present discussion, "This ambiguousness does not represent an imperfection in the nature of existence or in that of consciousness; *it is its very definition*".¹¹⁶ Similarly, Eco writes that "'Openness'... is the guarantee of a particularly rich kind of pleasure that our civilization pursues as one of its most precious values, since every aspect of our culture invites us to conceive, feel, and thus see the world as possibility".¹¹⁷ In this context, he emphasizes that the "open" work, rather than proclaiming "the death of form", proposes "a new, more flexible version of it - *form as a field of possibilities*".¹¹⁸

Lastly (and leading us on to the next section), Eco describes the dialectic between the work and its openness as a guarantee of "both communication and aesthetic pleasure".¹¹⁹ Here, he refers to the "reader" (or as I would say, participant or Immersant), "... who, at the very moment in which he abandons himself to the free play of reactions that the work provokes in him, [and] goes back to the work to seek in it the origin of the suggestion and the virtuosity behind the stimulus, is not only enjoying his own personal experience but is also appreciating the value of the work itself, its aesthetic quality".¹²⁰

¹¹⁵ Ibid., 16. Eco quotes Husserl, *méditations cartésiennes*, Med 2. par 19 (Paris:Vrin, 1953:39)

¹¹⁶ Ibid., 17. Emphasis mine. Eco quotes Merleau-Ponty from the French *Phénoménologie de la perception* Paris: Gallimard, 1945, pp. 381-383.) Here, Eco suggests that phenomenology proposes to the artist, as well as to philosophers, certain declarations which "are bound to act as a stimulus to his creative activity in the world of forms": and in this context he again quotes Merleau-Ponty: "It is therefore essential for an object and also for the world to present themselves to us as 'open' ... and as always promising future perceptions". (p. 384).

¹¹⁷ Ibid., 104. In comparison, conventional design approaches to 3-D digital imaging, interactive and otherwise, when based on objective realism and artificial perspective, could be considered a belated and conservative expression of classical Renaissance form (a premise also suggested by Simon Penny in "Virtual Reality in the Completion of the Enlightenment") which according to Eco is essentially unambiguous, static and closed-in. Of such perspective, Eco writes, "The scientific and practical development of the technique of perspective ... led to a tendency to operate against the 'openness' of the work, to favor its 'closing out'. The various devices of perspective were just so many different concessions to the actual location of the observer in order to ensure that he looked at the figure *in the only possible right way* - that is, the way the author of the work had prescribed, by providing various visual devices for the observer's attention to focus on". 5.

¹¹⁸ Ibid., 103.

¹¹⁹ Ibid., 104

¹²⁰ Ibid., 103.

5. The Artwork as Installation

In this section, I will describe *Ephémère* as a physical artwork installed in a public venue such as a museum, whereby the solitary immersive experience is expanded to a live performance/spectacle viewed by an audience. This "doubling", first mentioned in context of painting in Chapter III, is an important component of my overall work, and I have therefore always declined to exhibit my immersive virtual environments without this full context.

In such a context, visitors to the installation first pass through a dark passageway (serving as a light trap) and enter a large darkened viewing/observer area approximately 30' x 30'. This space is doubly illuminated: by the warm fire-like glow of a translucent screen set over a vertical doorway-like opening (approx. 8 x 4 ft); and by the flickering projection of imagery cast horizontally in landscape format (approx. 8' by 16') upon a facing wall. The acoustics of this space are deliberately muffled, providing a quiet background for the work's sounds which are broadcast through surrounding speakers. There are also benches, and several pairs of stereo audio headphones. Individuals scheduled for immersion usually arrive early and settle down in the darkness, watching/listening to several live immersive experiences of others before them.

When the appointed time arrives, the participant is ushered into a small chamber away from public scrutiny. An attendant then helps her put on the interface apparatus, consisting of the mask-like HMD and breathing/balance vest, which are linked by an umbilical-like cable to the computers and sound processors in an adjacent room. The donning of such gear is subtly ritualistic, necessary as it is to transform the viewer into participant into immersant, who then "enters" the virtual realm. Also subtly ritualistic is the accompanying presence of the attendant (who sometimes serves as a guide through voice or touch) as the immersant undergoes the experience; and equally, the deliverance of the immersant into the care of the attendant at the journey's end. (I will discuss the immersive experience in the next section.)

Experience of the work, however, does not take place only through immersion: in public exhibitions, there is a performative aspect as well. During the 15 min. immersive session, the immersant's body is lit from behind by a single stage light within the immersion chamber which casts a warm fire-like glow and dark shadow-silhouette upon the translucent screen. As the immersant moves throughout the experience, i.e., breathing, leaning to shift balance, bending and crouching, as well as turning her head to look and spontaneously gesturing, her dark shadow-silhouette can be observed from the adjacent viewing area.¹²¹ At the same time, as the immersant

¹²¹ The situating of the shadow within a warmly lit vertical doorway recalls a long-recurring element in my work, i.e., that of the luminous doorway as "threshold", described in Chapter IV, in the *Ephémère* working notes, Aug. 1996. I want to point out here that my use of the shadow was not intended in homage to Plato's allegory of the cave, which I had mentioned in my 1991 statement (included in Chapter I) in context of warning against the dangers of so-called virtual reality. Although I have no written notes regarding my earliest conceptualization of the shadow-silhouette in the installation design for *Osmose* in 1995, if anything, it would have been a reference to remind the audience that *Osmose* itself was based on artifice (similarly to my use of the code-realm as a substratum in *Osmose* to remind immersants that their experience was not of some "pristine other world" but was being enabled by digital technology).

Richard Coyne, in *Technoromanticism: Digital Narrative, Holism, and the Romance of the Real*, (50-51) makes some interesting comments about how most cyberspace narratives, in the tradition of what he calls "technoromanticism", borrow heavily from the legacy of Plato's concept of the real - whereby the world is divided into a realm of shadows (the sensible imperfect world perceived through our bodily senses) and a transcendent realm beyond appearances, of perfect ideas,

experiences the virtual environment and interacts with its various visual/aural elements, what she sees is displayed as a large-scale data projection¹²² on the wall of the viewing/observer area; and what she hears is cast through surrounding audio speakers and stereo headphones. Accordingly, and most significantly, viewers can "witness" the Immersant's experience as it takes place *in real-time* from the Immersant's own point-of-view.

Thus, even while the Immersant is fully attentive to her own intimate experience, she is nevertheless doubly a performer of the work, as both her body shadow-silhouette and the ensuing imagery/sound become public spectacle. On a practical level, this strategy is intended to provide a shelter of privacy (and anonymity) for the Immersant, even while expanding her solitary experience to enable an audience – often comprised of individuals who are about to undergo, or have just undergone their own immersive sessions – to observe the Immersant's shadow and watch/listen to her experience as it is taking place.

Most obviously in this context, the Immersant becomes *both* perceiver and perceived: but there are other implications as well.

Reaffirming the body, as ground and medium

First of all, this strategy – of casting the Immersant's shadow-silhouette through an illuminated opening adjacent to (or facing) a luminous data projection of what she is seeing within the virtual realm – is intended to draw attention to the relationship between the Immersant's living breathing body and the resulting work. (When there is no one "inside" the work, imagery/sound continues to be displayed in real-time randomly, but the warmly lit doorway is empty, and the absence of a bodied shadow-silhouette within it signifies that the virtual realm is uninhabited.) In drawing attention to such correspondence, such *dependency*, between the Immersant's shadow-body and the imagery/sound (i.e., the immersive realm itself), my intent is to emphasize the essential, *pivotal* role of the subjectively-inhabited body in immersive virtual space: not only as subjective "ground" for the experience (as everything the Immersant perceives is grounded in her own breath/balance), but also as "medium" for the public spectacle, whereby everything the audience witnesses is literally seen/heard *through* the Immersant's body.

Such affirmation is intended in deliberate contrast with conventional approaches to virtual environments (artistic and otherwise) whereby the presence of the participant's body is usually overlooked, or rather denied. As I have explained in Chapters I and II, such denial serves to reinforce traditionally dualistic attitudes towards the body: In comparison, most simply said, my work seeks to reaffirm the living subjective body as experiential ground and medium for our very existence as mortal beings.

universals and unchanging forms, which is considered the real, and the unity, beyond the fluxing multiplicity (as celebrated by the Pre-Socratics such as Heraclitus). As I have attempted to show throughout my text, and indeed my artworks, I emphatically do not subscribe to Platonic Idealism.

¹²² In some instances, the visual data has been projected in stereoscopy, enabling visitors wearing simple glasses to watch the Immersant's journey in full stereoscopic depth; however during most exhibitions of the work, only one eye from the HMD has been projected in order to simplify installation and reduce cost.

The doubled point-of-view

There is yet another aspect to this strategy, which I have earlier referred to as the "doubled point-of-view", related to the paradox of representing subjective experience. I have already mentioned this paradox in context of painting in Chapter III, in terms of my attempts to represent a voluminous three-dimensional space as it might be experienced by a perceiving-subject *within* (i.e., landscape or architectonic space experienced as body-enveloping "place"), while simultaneously viewed from *without* as a framed two-dimensional composition (i.e., pictorial space as "image"). I have also explained that it was my desire to resolve this paradox that eventually led me to abandon painting for the medium of immersive virtual space, whereby the viewer is no longer on the outside, but can effectively experience the work as if from within.

During public installations of my work however, whereby the immersive experience is combined with a cast shadow of the immersant's body and live projection of what she sees and hears, I deliberately revisit the "doubled point-of-view", but this time combining so-called subjective experience and objective viewing/representation in a more complex way. First and foremost in this context, is the participant's subjective experience of immersion in the virtual realm; second, is the cast shadow-silhouette of her body viewed externally; and third, is her subjectively-perceived ever-changing visual field displayed/represented (live, through her point-of-view as the immersive experience is unfolding) as a rectangularly-framed image for outside viewers to observe (as well as hear). This third aspect, involving as it does an "exteriorization" of "interior" experience, is intended to collapse, or at least confuse, the spaces of so-called subjectivity and objectivity, as well as virtual and actual, solitary and social.¹²³ As such, this strategy embodies my long-standing concern with subverting dualistic categories such as interior and exterior, within and without, as described in previous chapters.¹²⁴

¹²³ This metaphor of collapsing such categories can be further interpreted through Summers' notion of "double distance"; whereby he writes (apropos painting, not virtual environments), that "Any virtual space states its own spatio-temporality, its own distance; but because any virtual space presupposes a surface or *format*, it is also integral with a social space"; and accordingly, "For the modern interpreter, every virtual space thus represents a *double distance*, the represented space and the culturally specific decorum of its first spaces and times of use". 684. While this issue becomes more complicated by the apparent transcendence of the surface during firsthand experience of immersive virtual space (which I have referred to earlier in this chapter, when discussing the implications of using an HMD), it becomes more obvious when, as in the case of my installations, the contents of the immersant's visual field are displayed/represented on a surface/wall in the museum/gallery setting.

As Summers further writes: "Images on surfaces entail a *double distance*; they necessarily place what is shown in the context of relations (planar or virtual) only possible by means of surface itself, at the same time that they inevitably present image and relations in the real, social space of the observer/viewer. ... A surface is always a real surface in relation to other real surfaces – a wall in relation to other walls, for example – which are social spatial. An image placed on a wall takes its place within an institution, thus setting any observer within a range of appropriate behavior. This is really no more than to say that the principle of double distance is compatible with the principle ... that real space is the fundamental principle." 338-339.

¹²⁴ See for example, Chapter II, 5.2, *The "unification of interior and exterior"*; and Chapter II, 5.5, *The "intertwining" of perceiver(s) and perceived*. In the context of painting, see Chapter III, 2.4, *Representing the embodied perceiver/perceived in enveloping space*; and Chapter III, 2.6, *Interlacing space: the "intertwining" of interior, exterior, self and world*.

As performance

I now want to examine this strategy from the perspective of performance theory, as articulated by Stanton Garner, who suggests that phenomenology, with its "twin perspective" on the world as both perceived *and* inhabited (with Merleau-Ponty's emphasis on embodied subjectivity), can uniquely illuminate the experiential duality of the stage (and I would add, installations such as mine).¹²⁵ As Garner explains, the field of performance is both environmental space, "'subjectified' (and inter-subjectified) by the physical actors who *body forth* the space they inhabit", *and* scenic space, "given as spectacle to be processed and consumed by the perceiving eye, objectified as field of vision for a spectator who aspires to the detachment inherent in the perceptual act".¹²⁶ Theatrical space is thus "phenomenal space, governed by the body and its spatial concerns, a non-Cartesian field of habitation which undermines the stance of objectivity and in which the categories of subject and object give way to a relationship of mutual implication".¹²⁷ Such implication, he suggests, includes the audience, situated in the "phenomenological continuum of space through physical proximity ... and the uniquely theoretical mirroring that links audience with performer in a kind of corporeal mimetic indemnification".¹²⁸ As such, he writes, "The embodied *I* of theatrical spectatorship is grounded, one might say, in an embodied eye".¹²⁹

First of all, Garner's comments have an obvious correspondence to what I have called the "doubled point-of-view" in context of my discussion on painting: here, his terminology of objectified "scenic space" could be considered equivalent to "pictorial space" with its predetermined compositional frame; and his subjectified "environmental space" corresponds to my definition of "landscape or architectonic space" as subjectively-experienced body-enveloping 360x360-degree "place". But even more relevantly, his scenic space of public spectacle can be seen as the *Ephémère* installation space with its shadow of the Immersant's performing body and projection of images and sounds on the museum wall; and his "environmental space" subjectified by physical actors is, of course, the intimate and private space of solitary immersion.

In my installations there is, as already explained, an intentional intermingling of these two spatialities, whereby the projected images/sounds which the audience can witness are constructed *through* the subjective body of the Immersant, as source and medium for both the private and shared experience. In this context, Garner's insights are also relevant, for he suggests that the performance field (as disclosed by phenomenology) is characterized by an "ambiguity between the perceptual and the habitational, in which space and object oscillate between visual objectification and phenomenal embodiment", at the center of which is the human body, "simultaneously subject and object".¹³⁰ In this context, he suggests, "theatrical space is 'bodied' in the sense of being comprised of bodies positioned within a perceptual field, but it also 'bodied' in the more fundamental sense of 'bodied forth', oriented in terms of a body that exists not just as the object of perception, but as its

¹²⁵ Stanton B. Garner, *Bodied Spaces: Phenomenology in Performance in Contemporary Drama*, 3. Garner describes phenomenology here as the study of "givenness" (from the Greek *phainomenon* deriving from *phainein*, to show), of the world "as it is lived rather than the world as it is objectified, abstracted, and conceptualized." 26.

¹²⁶ *Ibid.*, 3. Emphasis mine.

¹²⁷ *Ibid.*, 3-4.

¹²⁸ *Ibid.*, 4.

¹²⁹ *Ibid.*

¹³⁰ *Ibid.*

originating site, its *zero-point*".¹³¹ Furthermore, he writes, to "stage this body in space before the witness of other bodies is to engage the complex positionality of theatrical watching":¹³² I would equally attribute such complex positionality to my installations, whereby viewers can witness the exteriorization of the interior experience of those undergoing immersion in the virtual realm.

6. The Immersive Experience

At the time of this writing, more than 30,000¹³³ people have been individually immersed in *Osmose* and *Ephémère* in public exhibitions around the world (not including the many others who have witnessed such experiences). During the past decade of gathering written comments and recorded interviews, I have noticed some intriguing patterns of immersant behaviour and response.¹³⁴

For example, at first, new participants are usually intent on moving through the virtual realm to see as much as possible, in what appears to be an extension of everyday action-based, goal-oriented behaviour. Within several minutes however, their behaviour undergoes a noticeable change (I'm speaking of the majority here, not all): facial expressions relax, body gestures loosen, and instead of rushing, they slow down. Similarly, their attitudes seem to undergo a shift, as if away from rational "doing-this-to-make-that-happen" to simply "being", as their attention is redirected to contemplating their own percepts, in terms of the unusual sensations of floating and seeing/passing through things.

When immersants emerge from the experience, they are often in a state of astonishment, even more so when they realize they have lost all track of time, and cannot verbalize in rational sentences for several minutes afterwards. They also tend to feel an uplifting sense of mental and physical calm (no doubt caused by a ¼ hour of deep breathing). Furthermore, immersants describe their experiences in remarkably similar terms, reporting not only, most obviously, floating and seeing/passing through things (enabled through the work's design); but more inexplicably, that they feel they have been *out* of their bodies and *in* them simultaneously; that they have been in a *real* place, somewhere *else* (even if they do not know where *there* was); along with feelings of euphoria, often combined with a sense of sadness and loss when the experience was ending. Additionally, some immersants (to my knowledge, always men) have gone off to a quiet place after their experience, and cried.

What is going on here?

As I have mentioned at the beginning of this chapter, it is not my intent to analyze the effect of my artworks on others: however, in this context, some further discussion is warranted. But first however, I ask the reader to turn back briefly to Chapter III, and read again the sections "*Seeing which is not seeing*", and *Painterly (and poetic) seeing* – for there, I introduced the notion of how we go along on perceptual autopilot, normally out of touch with the "realness" of our own

¹³¹ Ibid. Emphasis mine. This recalls Merleau-Ponty's reference to the subjectively-lived body as the zero-point, in "Eye and Mind" (p. 178), as I have quoted in Chapter II, 2.2, *Immersion*, and Chapter III, 2.4, *Representing the embodied perceiver in enveloping space*.

¹³² Ibid.

¹³³ We stopped estimating the number of immersants in the work after *Osmose/Ephémère's* exhibition in Perth, Australia in 2003. Since then there has been a 4 month-exhibition in Melbourne, and so on.

¹³⁴ Such responses have been gathered through written comments & video interviews during exhibitions of *Osmose & Ephémère* in Canada, the USA, England, Australia and Mexico, since 1995.

being and the world. To this end, I quoted Merleau-Ponty, Abram and Levin, and even Coleridge, Blake, and Huxley, as well as Nishitani, each of them saying, in a different way, that there is (to re-quote Levin) "...in all of us, a certain blindness: a blindness characteristic of what Heidegger calls 'the everyday perception of mortals'", whereby even though we begin our lives eyes wide in wonder, by adulthood our vision *conforms* to the gaze of our social order, and our "ingrained tendency to live by habit and in the projections of desire blocks or obscures our vision".¹³⁵ In other words, we look, but *we do not see*...

Considered in this context, my approach to Immersive virtual space is based on the belief, presented in earlier chapters,¹³⁶ that this medium is capable – *if, and only if*, its conventional reinforcement of habitual perception/behaviour is subverted – of providing an experiential context for facilitating a temporary release from this "blindness", not only in terms of perceptions lulled and dulled by the familiarity of the everyday, but of culturally-ingrained assumptions based on a dualistic objectifying and technologized interpretation of the world. (The paradox, of course, is that this medium itself is technologically-based, which is why subversion of its inherent biases is so essential.) And in facilitating such release, such "undoing", I believe carefully-constructed virtual environments can provide a brief opportunity for glimpsing perception beyond the Cartesian divide, for seeing *freshly*, and in so doing, perhaps even for experiencing, as Levin so eloquently writes, a "recollection of Being".¹³⁷

"Deautomatizing" perception

In order to illuminate this possibility, I want to draw on the research of the psychologist Arthur Deikman into traditionally-induced altered states of awareness.¹³⁸ From his perspective, the "blindness" referred to above originates in perceptual and cognitive "automatization",¹³⁹ a process wherein human "development from infancy to adulthood is accompanied by an organization of the perceptual and cognitive world that has as its price the selection of some stimuli ... to the *exclusion* of others".¹⁴⁰ When this automatization is reversed, he suggests, or even temporarily suspended, "aspects of reality that were formerly unavailable may then enter awareness".¹⁴¹ According to Deikman, age-old traditions such as contemplative meditation (already referred to Chapter II, 5.3, in context of Drew Leder's discussion of Zen practice) are specifically aimed at "deautomatization",

¹³⁵ See my quotation of Levin, in Chapter III, 1.1, "Seeing which is not seeing" (Levin, *The Opening of Vision: Nihilism in the Postmodern Situation*, 55; 58; 65.)

¹³⁶ See Chapter 1, 2.2, *Techne as poiesis*; and Chapter II, 2.5, *Immersive virtual space as a means of transforming perception*, on Bachelard's comments on the psychologically invigorating potential of unfamiliar environments; and Chapter II, 4.3, *Transforming habitual perception of nature through virtuality*, on facilitating a questioning of perceptions we take for granted.

¹³⁷ Levin, *The Opening of Vision: Nihilism and the Postmodern Situation*, 26.

¹³⁸ I have already quoted Deikman in Chapter II (footnote 271) in context of my epiphanic experience in the field, regarding his definition of spontaneous, untrained mystic experiences.

¹³⁹ Arthur Deikman, "Deautomatization and the Mystic Experience", 42. Deikman attributes the concept of "automatization" to H. Hartmann's *Ego Psychology and the Problem of Adaptation* (1958). A much more simple discussion of Deikman's hypothesis is contained in my 1997 essay "Changing Space: VR as an Arena of Being".

¹⁴⁰ *Ibid.*, 52. In his essay, Deikman references studies of many of colleagues and predecessors, which I will not take the time to detail here.

¹⁴¹ *Ibid.*

Involving "the undoing of automatization, by *reinvesting* [previously habituated] *actions and percepts with attention*".¹⁴²

As Deikman further explains, such techniques involve the deliberate redirection of intense attention toward percepts while avoiding all abstract categorization and thinking. Since automatization normally involves "the transfer of attention *from* a percept or action to abstract thought activity, the meditation procedure exerts a force *in the reverse direction*", whereby "cognition is inhibited in favour of perception", and "an active intellectual style is replaced by a receptive perceptual mode",¹⁴³ which he elsewhere describes in terms of passivity and self-surrender.¹⁴⁴ (There are echoes here of my earlier discussions of Heidegger's notion of *Gelassenheit* as meditative thinking and cultivation of wonder.¹⁴⁵ Considered in this context, Levin's interpretation of releasement (*Gelassenheit*), as a "transition from willing to 'letting be'",¹⁴⁶ may explain why men have cried after *Osmose*.)

Deautomatization through such procedures, Deikman explains, can produce *unusual* sensibilities, involving "alterations in the visual perception of sensory and formal properties of the object [being perceived], and alterations in ego boundaries - all in the direction of fluidity and breakdown of the usual subject-object differentiation".¹⁴⁷ (These can include feelings of intense "realness", unusual percepts, undifferentiated unity, ineffability, and transensate phenomena, all of which, Deikman writes, are principal features of the mystic experience.¹⁴⁸) In this context, he writes, deautomatization can be conceived "as permitting the adult to attain a new, fresh perception of the world by freeing him from a stereotyped organization built up over the years and by allowing adult synthetic and associative functions access to fresh materials, to create with them in a new way that represents an advance in mental functioning."¹⁴⁹

(Most interestingly, Deikman suggests that "The search of the artist to find a new expressive style [and, I would, medium] may be viewed as the struggle to *deautomatize* his perception and the evolution of styles is accordingly necessary to regain vivid, emotionally

¹⁴² Ibid., 42. Deikman draws on the concept of "deautomatization" developed by M. Gill and M. Brennon, in *Hypnosis and Related States*, 1959)

¹⁴³ Ibid., 43. Emphasis mine. Deikman emphasizes that training in contemplative meditation is specifically directed toward attaining a state with these characteristics: a) heightened attention directed to the sensory pathways; b) an absence of controlled, analytic thought; and c) an attitude of receptivity to stimuli instead of defensiveness or suspicion. 50.

¹⁴⁴ Ibid., 40.

¹⁴⁵ See my discussion in Chapter I, 2.2, *Techne as poiesis*; as well as earlier in this chapter, in the section "Letting-be" (*Gelassenheit*).

¹⁴⁶ As Levin writes in *The Opening of Vision: Nihilism and the Postmodern Situation*, "In the conversation in [Heidegger's] *Gelassenheit* [Discourse on Thinking, p. 61], the scientist avers that, as he puts it, 'The transition from willing into releasement [*Gelassenheit*] is what seems difficult for me'. So it is - not, however, for the Scientist alone, but for each and every one of us. In the realm of vision, crying is an involuntary expression of this difficulty: it is a *will-breaking process* of letting go: letting go of our fixed ways of seeing things, our metaphysical habits, our cultural typifications, our obsessions, our defenses. In the realm of vision, therefore, crying must be a crucial phase in the transition from willing to 'letting be', a new practice of vision". 191. And further, Levin writes, "The breaking down of the social ego's traditional defenses ... is therefore an opportunity to 'break open', to abolish a painful 'difference' between subject and object, to see, in *some way*, beyond its historical shadow". 192. I do not know if people have cried after *Ephémère*.

¹⁴⁷ Deikman, "Experimental Meditation", 262.

¹⁴⁸ Deikman, "Deautomatization and the Mystic Experience", 47.

¹⁴⁹ Ibid.

significant experience".¹⁵⁰ Deikman's comment not only recalls my earlier discussion of painterly seeing and style in Chapter III, 2.2; but also in Chapter I, 2.2, of Heidegger's concept of art as *poiesis*, as a "poetic revealing" which "thrusts up the unfamiliar and extraordinary and at the same time thrusts down the ordinary and what we believe to be such".¹⁵¹ It also recalls, in Chapter II, 2.5, Bachelard's notion of deliberately leaving the space of our usual sensibilities to defamiliarize and thereby invigorate our perceptions; as well as McLuhan's belief that the artist's role is to "open the door of perception to people otherwise numbed in a non-perceivable situation..."¹⁵²) In this context, Deikman also suggests that the "struggle for creative insight in all fields may be regarded as the effort to deautomatize the psychic structures that organize cognition and perception".¹⁵³ Accordingly, he emphasizes, "In this sense, deautomatization is not a regression,¹⁵⁴ but rather an undoing of a pattern in order to permit a new and perhaps more advanced experience": and as examples, he cites not only the crayfish sloughing its rigid shell when new growth is required, but also the mystic, who through meditation, "may also cast off, temporarily, the shell of automatic perception, of automatic effective and cognitive controls in order to perceive more deeply into reality".¹⁵⁵

Considered in this way, Deikman suggests, "The general process of deautomatization would seem of great potential usefulness whenever it is desired to break free from an old pattern in order to achieve a new experience of the same stimulus or to open a perceptual avenue to stimuli never experienced before".¹⁵⁶ Furthermore, he writes, "it is possible that deautomatization may permit the awareness of new dimensions of the total stimulus array - a process of 'perceptual expansion', whereby the mystic experience of unity (which would include the *Zen satori* experience of interpenetration of interior and exterior; and the *sunyata* experience of widening of focus to the surrounding horizon of openness¹⁵⁷) "may in fact be a property of the real world that becomes perceptible via the techniques of meditation ... or under the special conditions, as yet unknown, that create the spontaneous, brief mystic experience of untrained persons".¹⁵⁸ This last comment most obviously pertains to my experience in the field (especially if, as suggested in Chapter II, 5.6, *Landscapes of longing*, that such experience may be the original source of my motivations and ongoing concerns as an artist).

¹⁵⁰ *Ibid.*, Emphasis mine.

¹⁵¹ See my discussion in Chapter I, 2.2, *Techne as poiesis*. (The phrase "poetic revealing" is from Heidegger, "The Question concerning Technology", 34-35; and the following phrase from Heidegger, "The Origin of the Work of Art", in *Poetry, Language, Thought*, 75.)

¹⁵² See my Chapter II, 2.5, *Immersive virtual space as a means of transforming perception* (Bachelard, *The Poetics of Space*, 206; and McLuhan, *Through the Vanishing Point: Space in Painting and Poetry*, 241.)

¹⁵³ Deikman, "Experimental Meditation", 262.

¹⁵⁴ Deikman, "Deautomatization and the Mystic Experience", 41. Deikman is referring here to the psychological and psychoanalytic literature which tends to interpret such experience as a regression to the early infant-mother symbiotic relationship. He includes Freud's reference to the "oceanic feeling" as a memory of a relatively undifferentiated infantile ego state, as well as other references to regression to intra-uterine experience, and so on. In this context, Deikman's stated intention is to explain mystic phenomena in terms of "attentional mechanisms in perception and cognition". 42.

¹⁵⁵ Deikman, "Experimental Meditation", 262-263.

¹⁵⁶ *Ibid.*, 263.

¹⁵⁷ Toshihiko Izutsu, *The Interior and Exterior in Zen Buddhism*, 19; Odin, *Process Metaphysics and Hua-Yen Buddhism*, 37. I have not taken the time here to explore the difference between these two concepts/experiences, although I believe they are essentially one and the same.

¹⁵⁸ Deikman, "Deautomatization and the Mystic Experience", 52.

Dehabituating perception in Immersive virtual space

But more relevantly, Deikman's comment brings me back to my discussion of the medium of Immersive virtual space, in terms of its capacity for enabling perceptual transformation through deautomatization and dehabitation. (I want to emphasize here that I am *not*, let me repeat, *not* suggesting that it is possible to have "mystic" experiences in virtual environments. If the reader were to think that this was my intention, then I have surely failed in the past six chapters of this text. Neither has it been my intention to approach the medium as some kind of substitute for traditional meditation: I say this especially as someone who, as yet, has never taken up this practice, even if I wish I had.)

What I am suggesting, however, is that it may indeed be possible (if the responses of those who have experienced my works are anything to go by) to experience a temporary undoing, dehabitation or deautomatization of habitual conventionalized perceptions in Immersive virtual environments which are constructed like *Osmose* or *Ephémère*.

And, in the midst of such undoing and dehabitation – i.e., in the *absence* of representation which reinforces habitually objectifying perceptions, and in the *absence* of interactive modalities which reinforce habitually dominating behaviour (and as importantly, in the *presence* of representation which seeks to "present" alternatively, and in the *presence* of interaction which seeks to encourage alternative behaviour) – it may be possible to facilitate experience, even if only a little bit, of what it might be like to perceive, to behave, without (or rather beyond) the confines of our conventional world-view (i.e., as far as this can be imagined and manifested by the artist who has made the work). That such experience might be "psychically-innovating" (in the sense of Bachelard in context of "changing space", not to change place, but to change our own nature¹⁵⁹) suggests a genuine shift of awareness might be involved.

As I have suggested in previous chapters,¹⁶⁰ there are certain paradoxical qualities or characteristics associated with the medium of Immersive virtual space which lend themselves expressly to this possibility. (I want to remind the reader here that when referring to "virtual space", I am, of course, speaking metaphorically – because there is no "actual" space there, but only a technologically-enabled perceptual experience of such – which is why I so often use the word "medium" with its dual meaning as both *experiential effect*, as in being sensuously enveloped in a medium like water, and as *expressive, artistic form*.)

I also want to emphasize again, as I have written earlier, that the medium's dehabituating, and thereby invigorating, potential is possible *only* to the extent that a virtual environment has been deliberately designed to be *unlike* our everyday perceptions and experience, i.e., that it does not seek to mimic surface appearances or represent via objective realism or artificial perceptives, nor reproduce habitual behaviour from the "actual" terrestrial world. When designed in ways that merely reflect such perceptions, attitudes and behaviours, these works forego all transformative potential, and serve to reinscribe the status quo.

¹⁵⁹ See my discussion in Chapter II, 2.5, *Immersive virtual space as a means of transforming perception*. (Bachelard, *The Poetics of Space*, 206.)

¹⁶⁰ See Chapter I, 2.2, *The Challenge: "Rethinking Technology"*, *Techne as poiesis*; and Chapter II, 2.5, *Immersive virtual space as a means of transforming perception*, and 4.3, *Transforming habitual perception of nature through virtuality*.

The following comments are therefore made only in context of my own work, whereby – instead of representing the world as a collection of separate, solid, static, opaque hard-edged objects in empty space, wherein subject and object are dualistically positioned – I have strategically employed semi-transparency, flowing particles and transformation in order to de-objectify the contents of the virtual realm – and rather than reinforcing habitually instrumental controlling behaviour, I have sought, through use of breath and balance combined with gaze, to encourage an alternative attitude and behaviour, involving sensitive attention, *Gelassenheit* and contemplation.

Accordingly, in my works, it is possible for Immersants to experience being enveloped in an immaterial virtuality even while within an apparently “real” spatial three-dimensionality; to float as if gravity free; and to see through and pass through everything (and reciprocally, experience everything passing through one's self); all of which evoke sensations of disembodied Immateriality *even while being “grounded”* in the body's rhythmic breath. Such paradox, such *slippage* (as I have written in Chapter II) between the so-called virtual and actual, between mental concept and bodily percept, can create perceptual and cognitive confusion. Such confusion is further increased as the Immersant finds herself adrift among multiplicities of ever-transforming, semi-transparent forms, all variously coming into being, lingering and passing away; whereby distinctions between inside and out, near and far, figure and ground, seem ambiguous; and boundaries between self and world, interior and exterior become permeable.

In this way, the “familiar” becomes the “un-usual”: and as a result, I would propose (following Deikman's model and my comments above) instead of remaining on perceptual autopilot, caught up in habitual assumptions and behaviour (including abstract thought and conceptualizing about the future), the Immersant may experience an intense redirection or transfer of attention towards her own unusual percepts and abilities, in the present here and now. This shift of attention is aided by the cumulative effect of breathing deeply over a 15-minute duration, as well as the solitary “cloistered” aspect of the experience, whereby she is sheltered from external everyday distractions by wearing the HMD and undergoing Immersion in a dark and quiet chamber.

“Turning the light to what is directly underfoot”

In Chapter II, 5.3, *Transforming habitual perception of nature through virtuality*, I quoted Keiji Nishitani who writes that normally, i.e., habitually, “we proceed through life, on and on ... always caught up with something within or without ourselves”: “It is these engagements”, he explains, “that prevent the deepening of awareness”.¹⁶¹ Among such engagements, he includes the arts – and in this context, he would surely include the artificial highly-technologized environments of virtual-reality. (As an artist, I am compelled to make artworks, whether paintings or virtual environments, all of which are mediated interpretations/constructions of reality, so that is not the issue here.¹⁶²) What is more interesting to me – as an artist working with immersive virtual space,

¹⁶¹ Nishitani, *Religion and Nothingness*, 4.

¹⁶² As Umberto Eco writes: “Our civilization is still far from accepting the unconditional abandonment to vital forces advocated by the Zen sage. He can sit and blissfully contemplate the unchecked potential of the surrounding world: the drifting of clouds, the shimmer of water, cracks in the ground, sunlight on a drop of dew. And to him everything is a confirmation of the endless, polymorphous triumph of the All. But we still live in a culture in which our desire to abandon ourselves to the free pursuit of visual and imaginative associations must be *artificially induced* by

motivated by intentions to dehabituate and transform perception, as I have explained throughout this chapter, and indeed this entire text – Is Nishitani's following comment:

Sometimes, he writes, the horizon opens up at the bottom of those engagements and "something seems to halt and linger before us", something which "brings the restless, forward-advancing pace of life to a halt and makes it take a step back", and in doing so, he suggests, as the Zen phrase says, this something "turns the light to what is directly underfoot", as in an illuminating of what is "underfoot of the self".¹⁶³ As I interpret what he means here, it is that sometimes, under certain conditions, we can be temporarily released from our distractions, our habits and everyday assumptions – to stop and question the very Being (and non-Being) of life, our own individual life, of all life, itself. When we do that, for a moment we can see our former "blindness", our taking for granted all of *this*...

Nishitani's statement resonates deeply with what I have attempted to accomplish as an artist. At the beginning of this text, I wrote that there are two agendas in my work, one of which was (and is) to communicate my sensibility of being in the world, embodied here now, so briefly, among this fluxing splendour, among *all this*...: And it is *this* which I am seeking to illuminate, for myself as well as others, *this*, which we habitually take for granted, "which lies underfoot". I also wrote that I came to the medium of immersive virtual space with the belief that it was more capable than any other for exploring and communicating this concern, but only if its instrumentalizing tendencies were subverted (thus, the necessary second agenda in my work): And in this context, I explained that more than a decade ago I had referred to my intentions as "lighting a lamp in a dark corner" so to speak, in terms of wanting to draw attention to, or rather illuminate, what I considered to be the most intriguing, yet overlooked, potential of this medium.

I say overlooked, because techno-romantic claims¹⁶⁴ for the technology have long overshadowed what I believe to be its richest, most paradoxical, capacity: for serving as a bodily-experiential, *experimental* arena, wherein not only habitual perceptions and behaviours may be dehabituated, but alternative visions of reality can be manifested and kinesthetically explored. When its biases and conventions are subverted, I believe that this medium can be used to temporarily release us – *not* from our bodies, as popularly imagined – but from the worldview (Heidegger's technological enframing) that constrains us, blinds us and blinds us, returning us to a remembering, a "recollection" of the very embodied and mortal beings that we are, among a myriad of other living beings, here, *with* us (all of us, so ephemerally, just passing through...)

As I have earlier quoted Richard Coyne, for Heidegger, "the antidote to the enframing of technology is not revolution but adopting a new attitude",¹⁶⁵ based not on mastery and control but involving wonder and astonishment at the very "isness" of the presencing of life itself. And this brings me back to *techne*, which I first talked about in Chapter I, as *poiesis*, as a poetic/artistic bringing-forth and revealing...; which returns me to *poiesis*, as *physis*, in terms of nature, not as a collection of separate objects or even beings, but all Being, presencing of its own accord...; and this returns me to Nishitani's reference to the Zen phrase of "turning the light" on to what is directly

means of an intentionally suggestive construct". The Open Work, 100. Emphasis mine. This, then becomes the role of the artist.

¹⁶³ Nishitani, 4.

¹⁶⁴ "Technoromantic" as thoroughly critiqued by Richard Coyne, in *Technomanticism: Digital Narrative, Pluralism, and the Romance of the Real*.

¹⁶⁵ Coyne, *Designing Information Technology in the Postmodern Age*, 85.

underfoot. For as Michael Harr suggests, for Heidegger, "'Nature' is emergence, coming into daylight; thus, essentially light: *physis* is the 'flame' that bursts into the non-lighted, and 'separates the clear from the obscure'...:"¹⁶⁶ And further, in Heidegger's own words, "*Physis* is the arising, the source of the clearing or lighting and thus *the hearth and the place of light*."¹⁶⁷

In this context, my seeking to use *techne* as *poiesis*, to metaphorically reveal the revealing (of *physis* as *poiesis*), can be interpreted through Nishitani, in context of my paradoxical effort to reveal, as in turn light upon, the overlooked potential of the paradoxical medium of immersive virtual space, to reveal, as in shine light upon, that which is "underfoot", hidden to us only by our culturally-enframed world-view.

It is in these terms that I believe this medium can be used for transforming perception. And in this context, I would like to end with the words of an Immersant: "[*This experience*] *heightened an awareness of my body as a site of consciousness and of the experience and sensation of consciousness occupying space; It's the most evocative exploration of the perception of consciousness that I have experienced since I can't remember when*".¹⁶⁸

¹⁶⁶ Michael Harr, *The Song of the Earth: The Heidegger & the Grounds of the History of Being*, 52.

¹⁶⁷ Heidegger (from *Erläuterungen zu Holderlins Dichtung*) in Harr, 52.

¹⁶⁸ Letter to the author from Yasmin Kharim, 1995.

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Appendix I

Technical Description of Ephémère

1. Onsite Installation

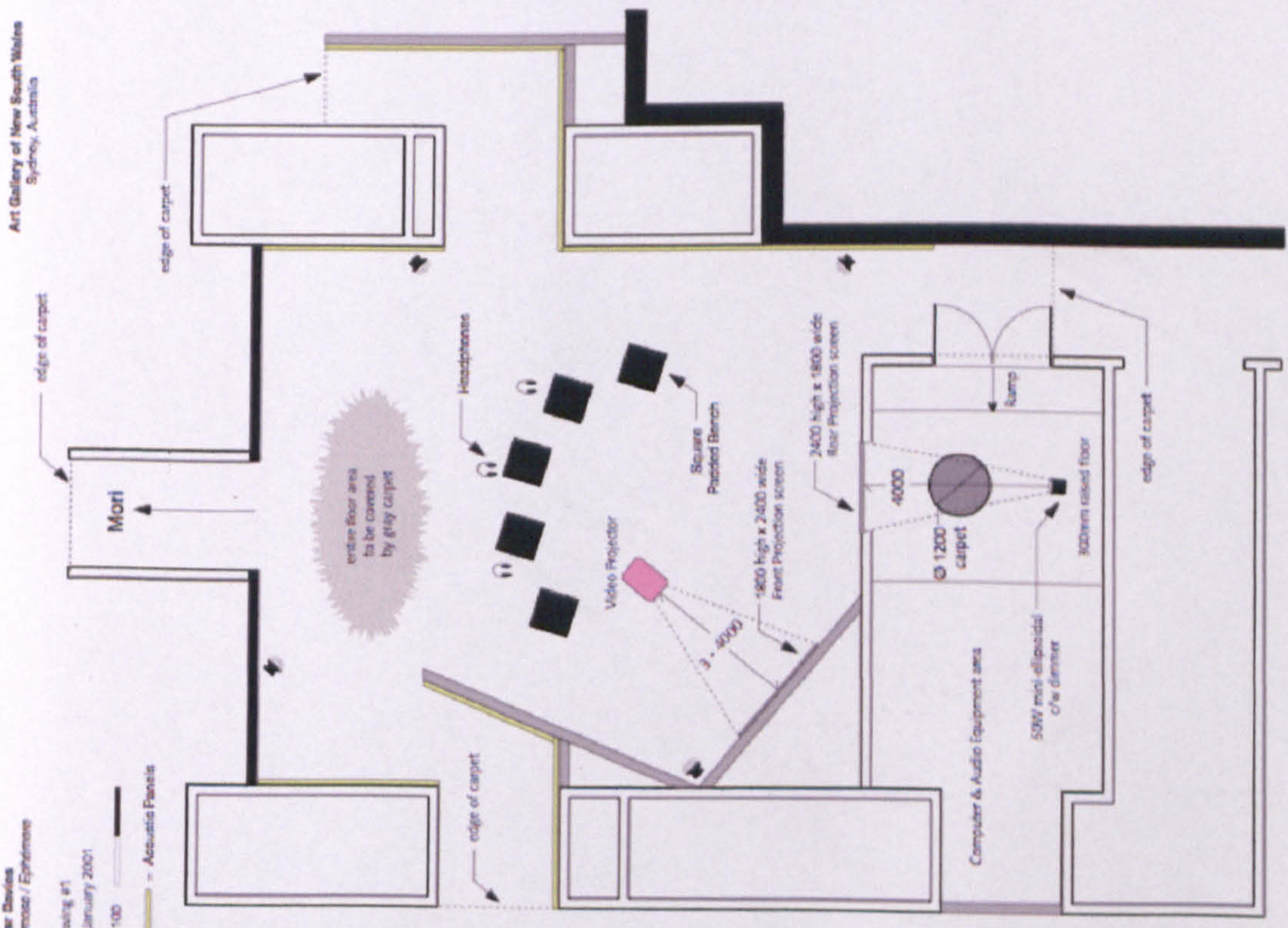
- Floor-plans
- Photographic Documentation

2. Technical Statements

- "Graphics & Interaction Programming Summary" by John Harrison
- "Sound Design Programming Summary" by Dorota Blaszcak
- "The Sound World of Ephémère" by Rick Bidlack

Char Davies
Osmose / Ephemere
drawing #1
16 January 2001
1:100

Acoustic Panels

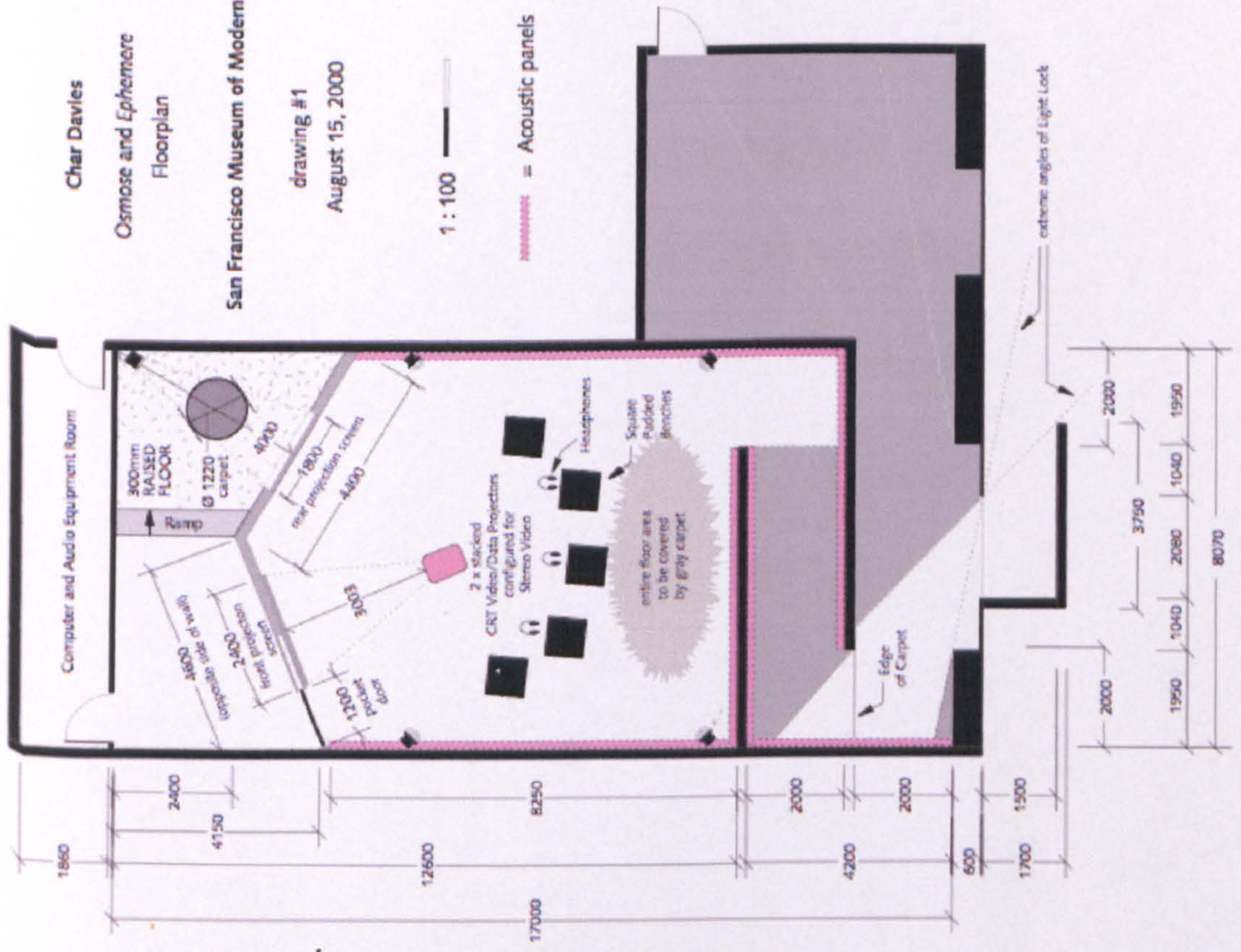


(Above) Osmose/Ephemere Floor Plan, Art Gallery of New South Wales, Sydney Australia, Jan. 2001.

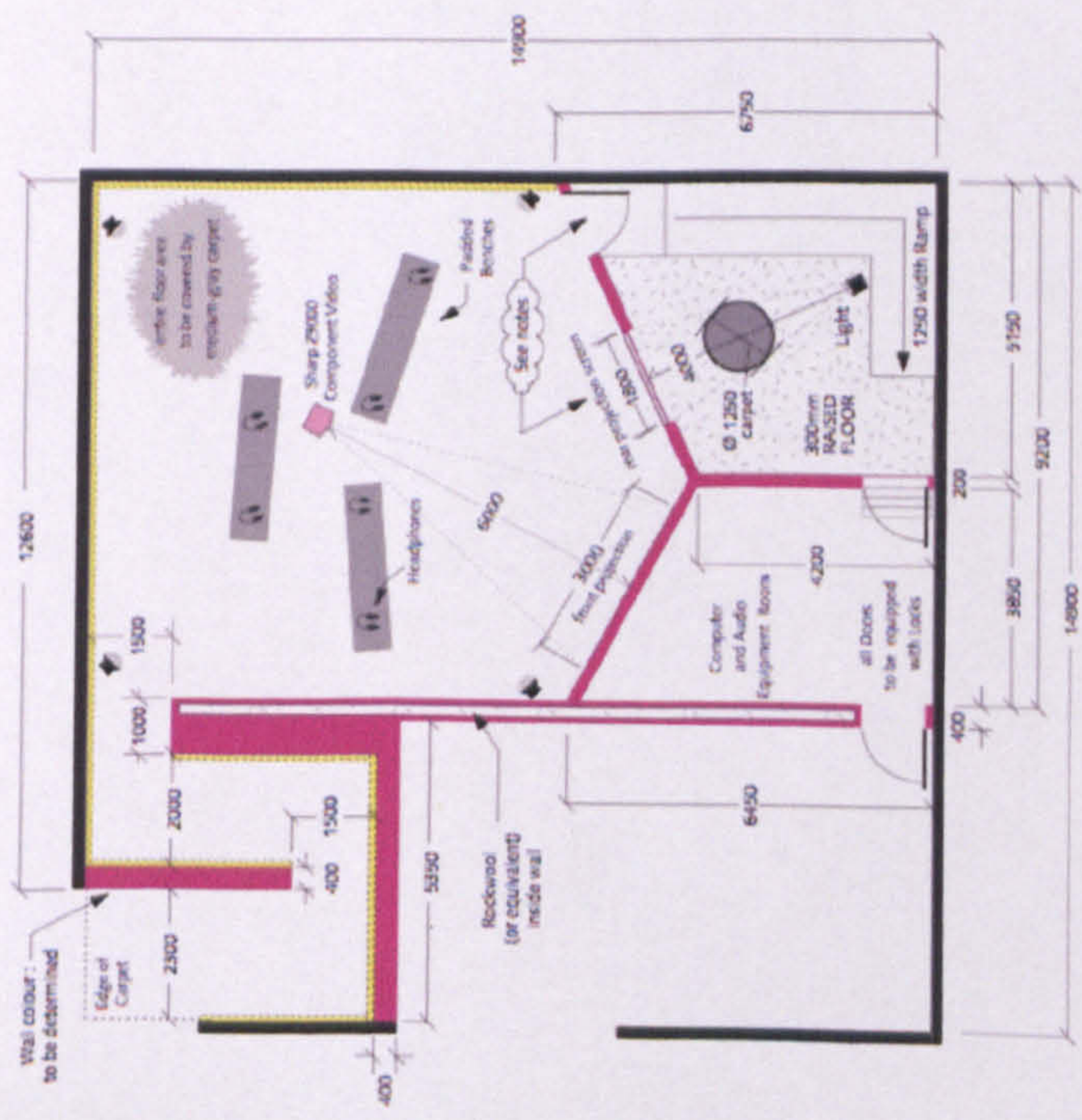
Char Davies
Osmose and Ephemere
Floorplan

San Francisco Museum of Modern Art
drawing #1
August 15, 2000
1:100

Acoustic panels



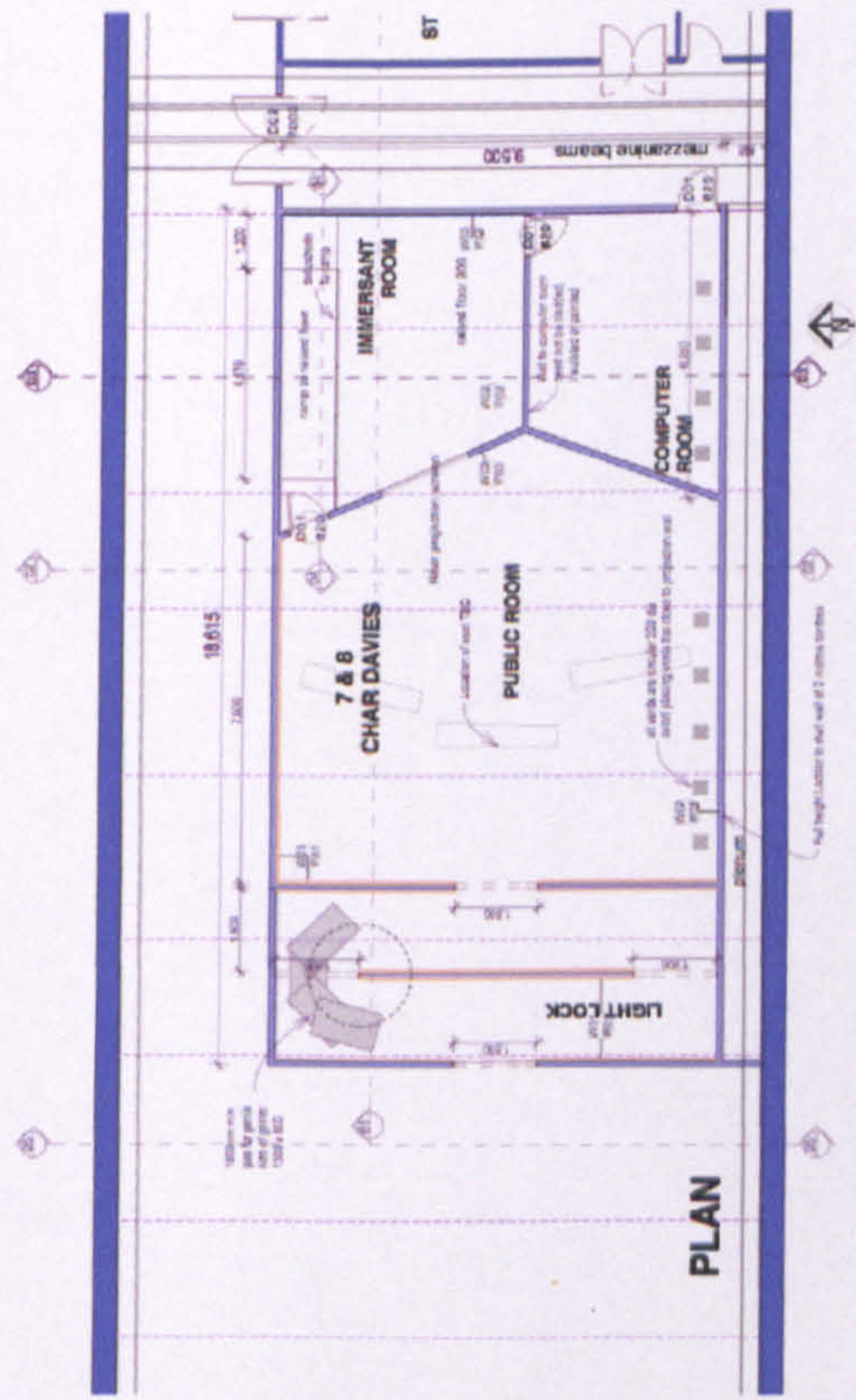
(Above) Osmose/Ephemere Floor Plan, San Francisco Museum of Modern Art, San Francisco, 2000.



Ceiling height = 3970
 (CEILING SURFACE TO BE SMOOTH,
 as non-reflective as possible, and LIGHT TIGHT)
 All walls to extend to ceiling, and Light Tight.
 Wall colour: 15% grey, except where noted.

Front Projection: wall surface to be smooth with no visible seams.
 Colour: hi-reflectance matte white (projection area only / TBC)
 (Rusco #8119 or equivalent).

Rear Projection Screen and Door: FLUSH with outside wall
 Sound Absorbent Acoustic panels



DRAFT ONLY
 NOT ISSUE FOR CONSTRUCTION

Project Title
CHAR DAVIES Osmose/Ephémère

Project No.
 0002 MANUFACTURE

Drawing No.
 01 Plan / Section

Revision
 W02

Author
 ARCHITECTURE

Department
 CIVILS

Scale
 1:100

Date
 16-08-03

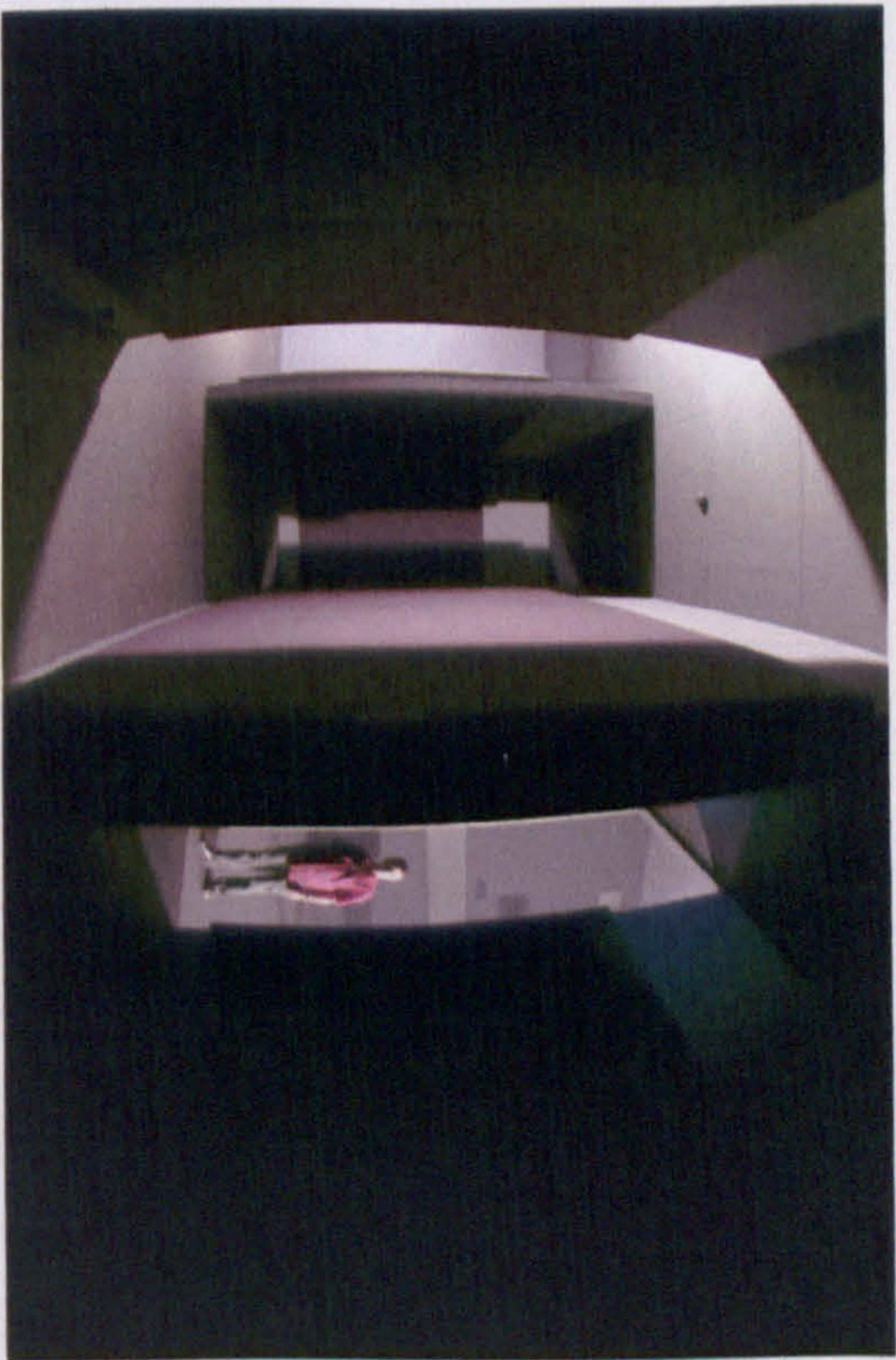
W01	P01
W02	P02
W03	P03

(Above) Ephémère Floor Plan, John Curtin Gallery 3, Biennial of Electronic Arts, Perth, Australia, 2002.

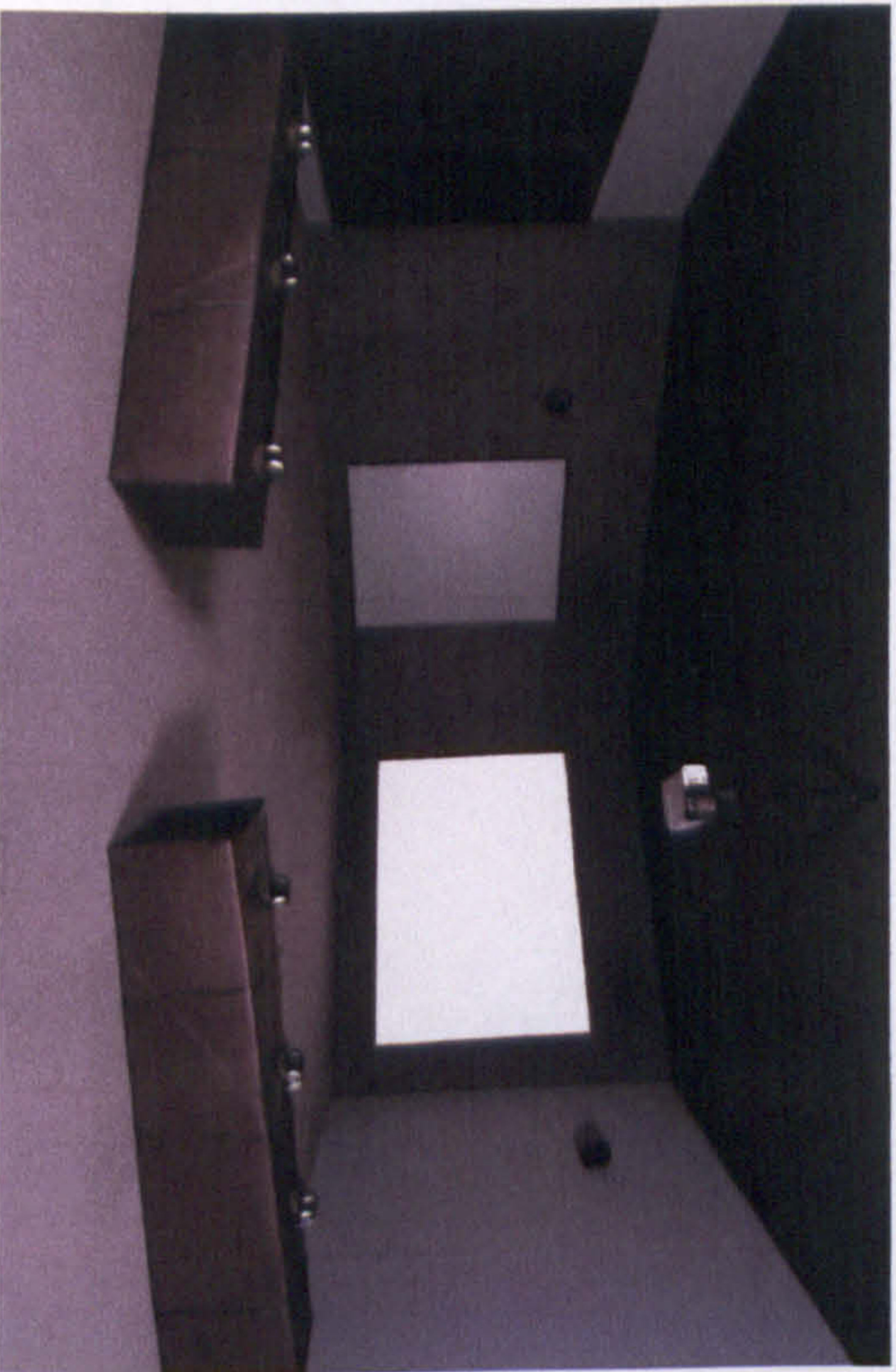
(Above) Osmose/Ephémère Floor Plan, Australian Centre for the Moving Image, Melbourne Australia, Dec. 2003.



(Above) Osmose/Ephémère Installation, Exterior, Australian Centre for the Moving Image, Melbourne Australia 2003.



(Above) Osmose/Ephémère Installation, Light Baffle, Australian Centre for the Moving Image, Melbourne Australia 2003.

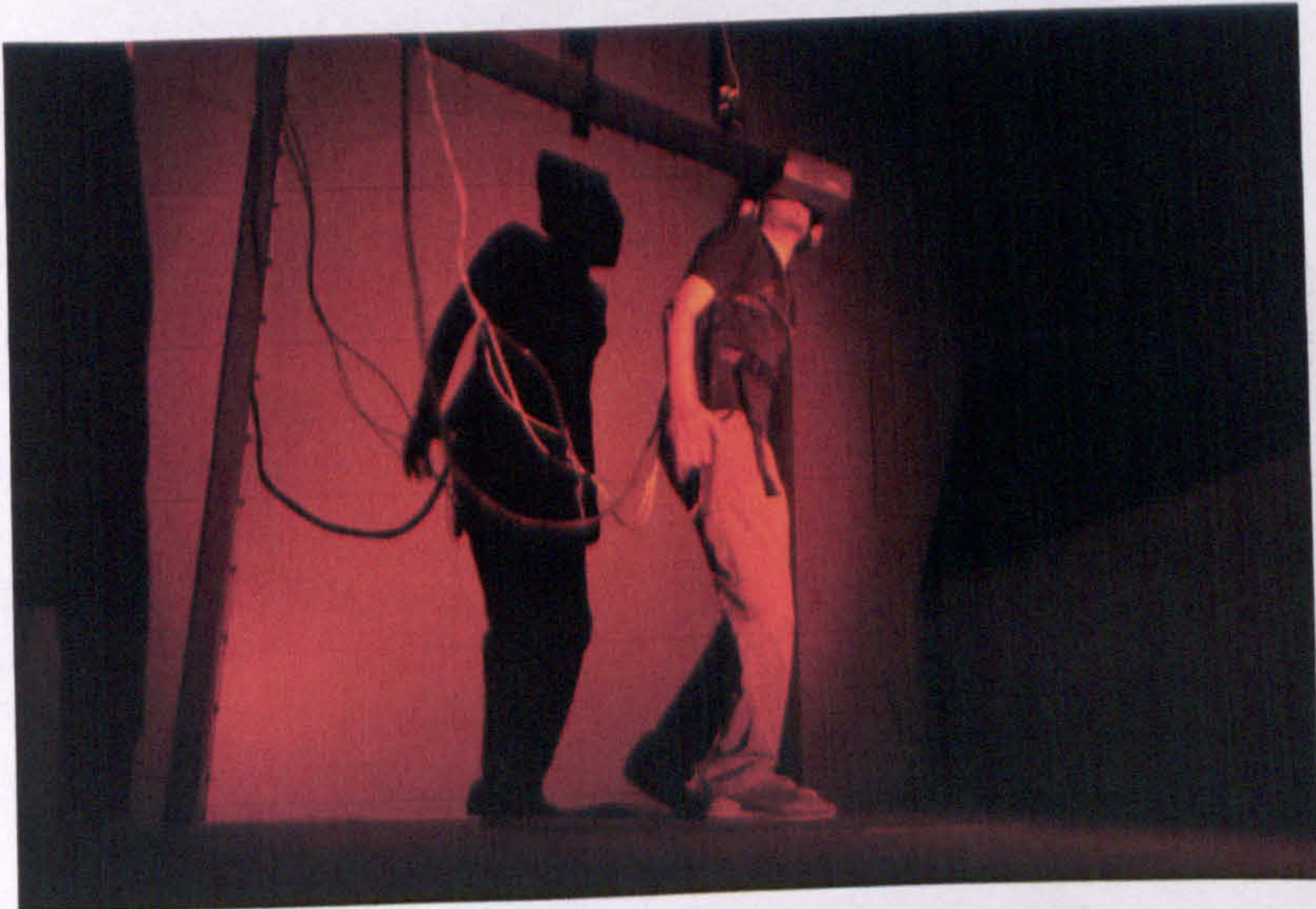
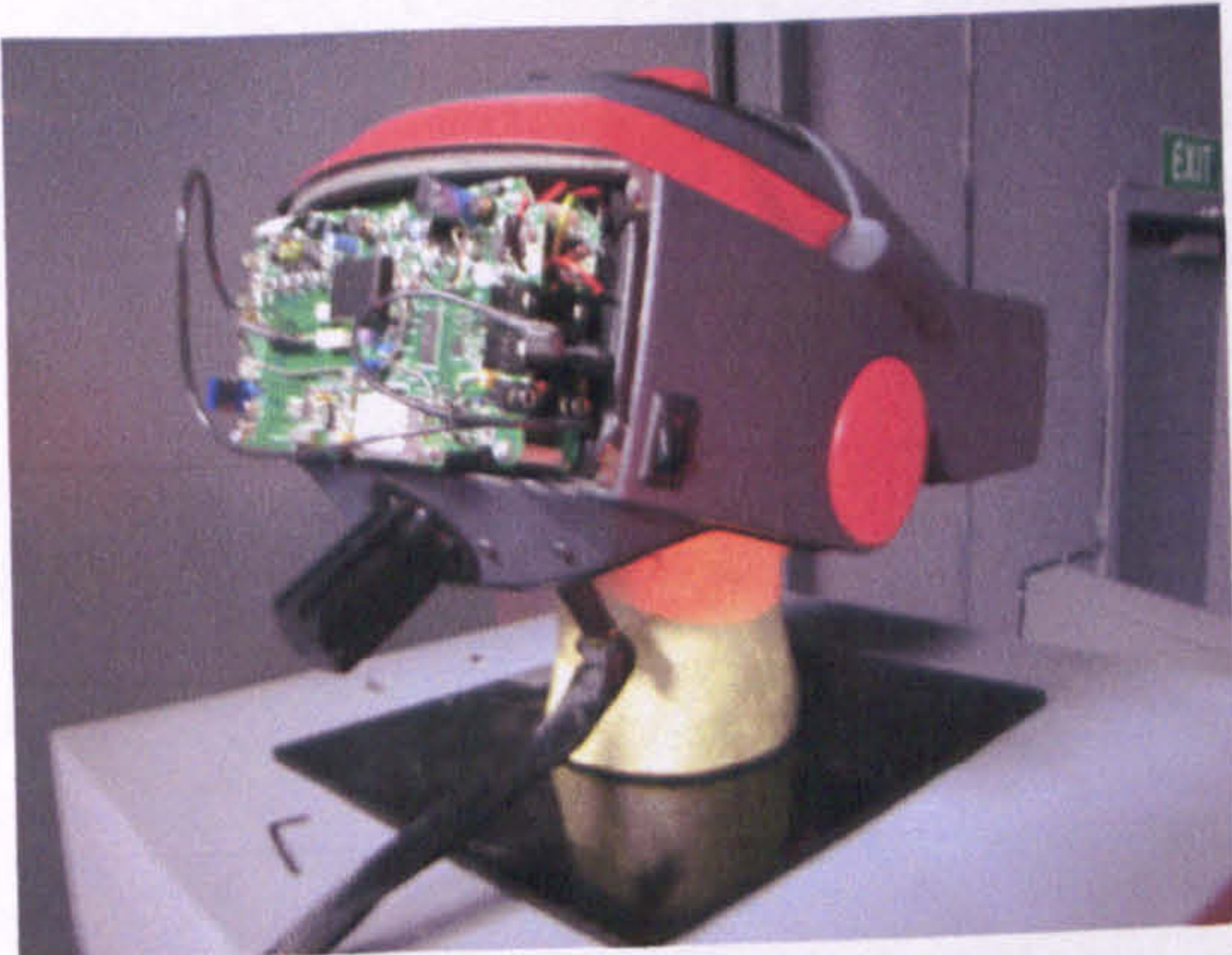


(Above) Osmose/Ephémère Installation, Interior Front, Australian Centre for the Moving Image, Melbourne Australia 2003.

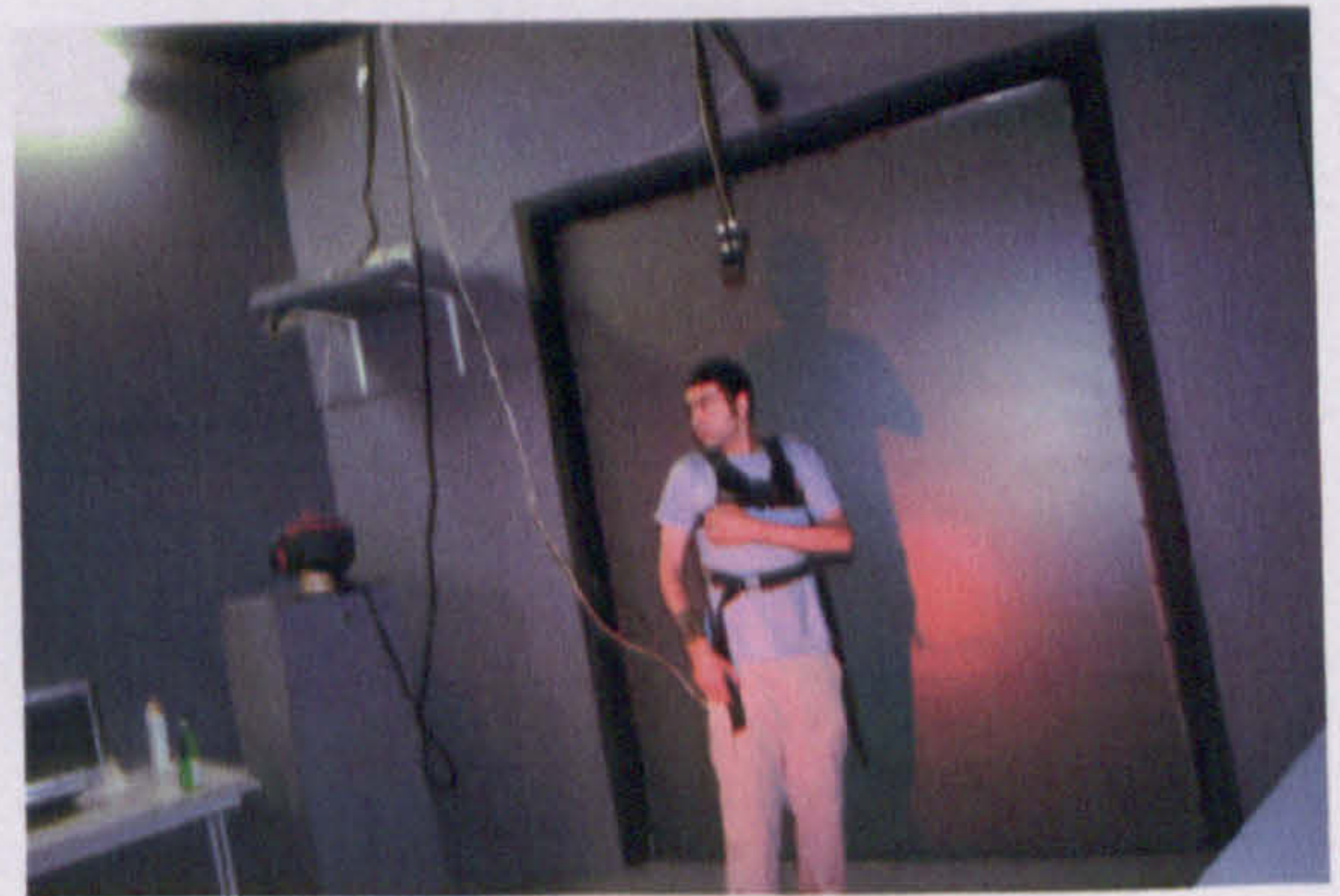
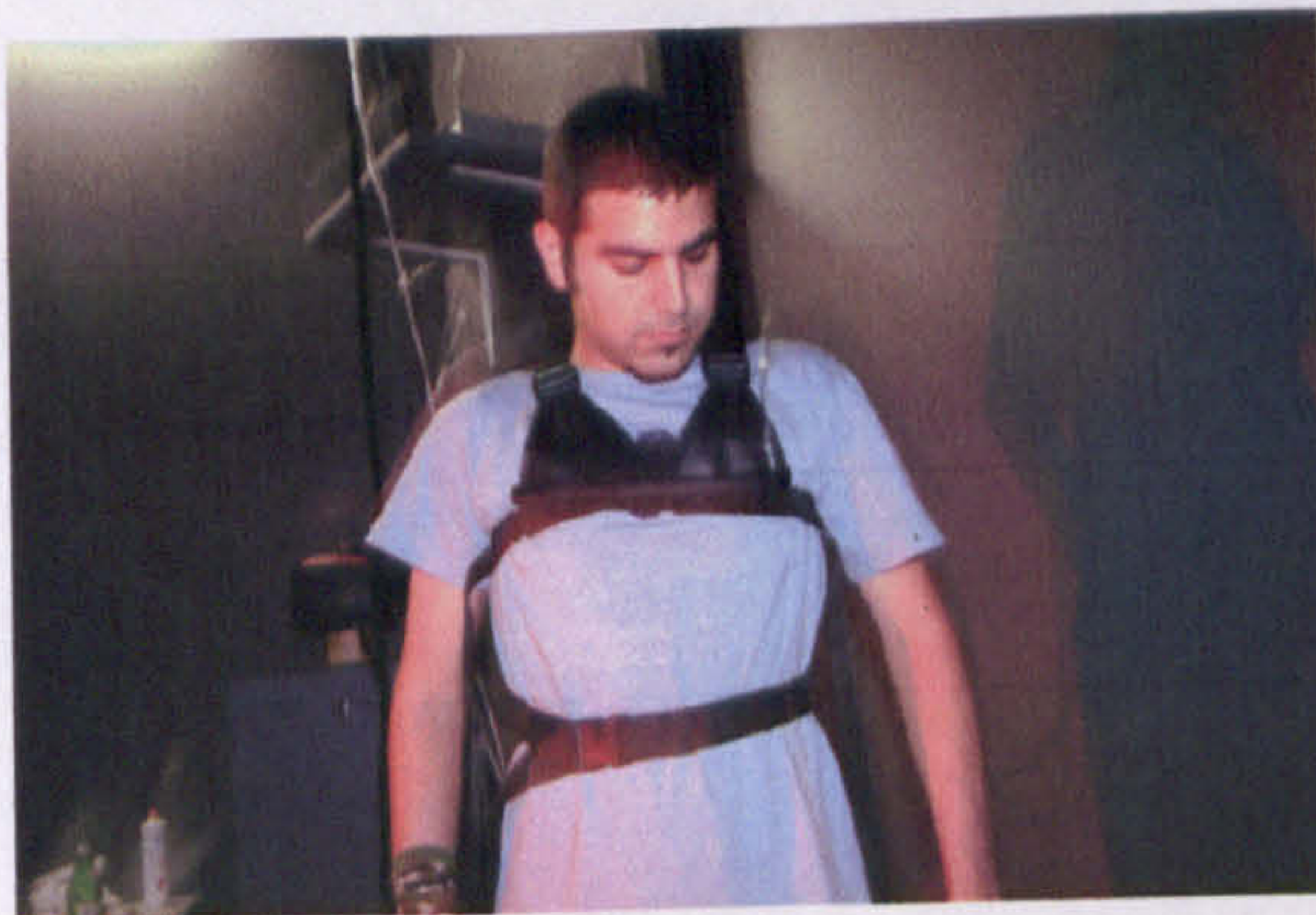


(Above) Osmose/Ephémère Installation, Interior Back, Australian Centre for the Moving Image, Melbourne Australia 2003.

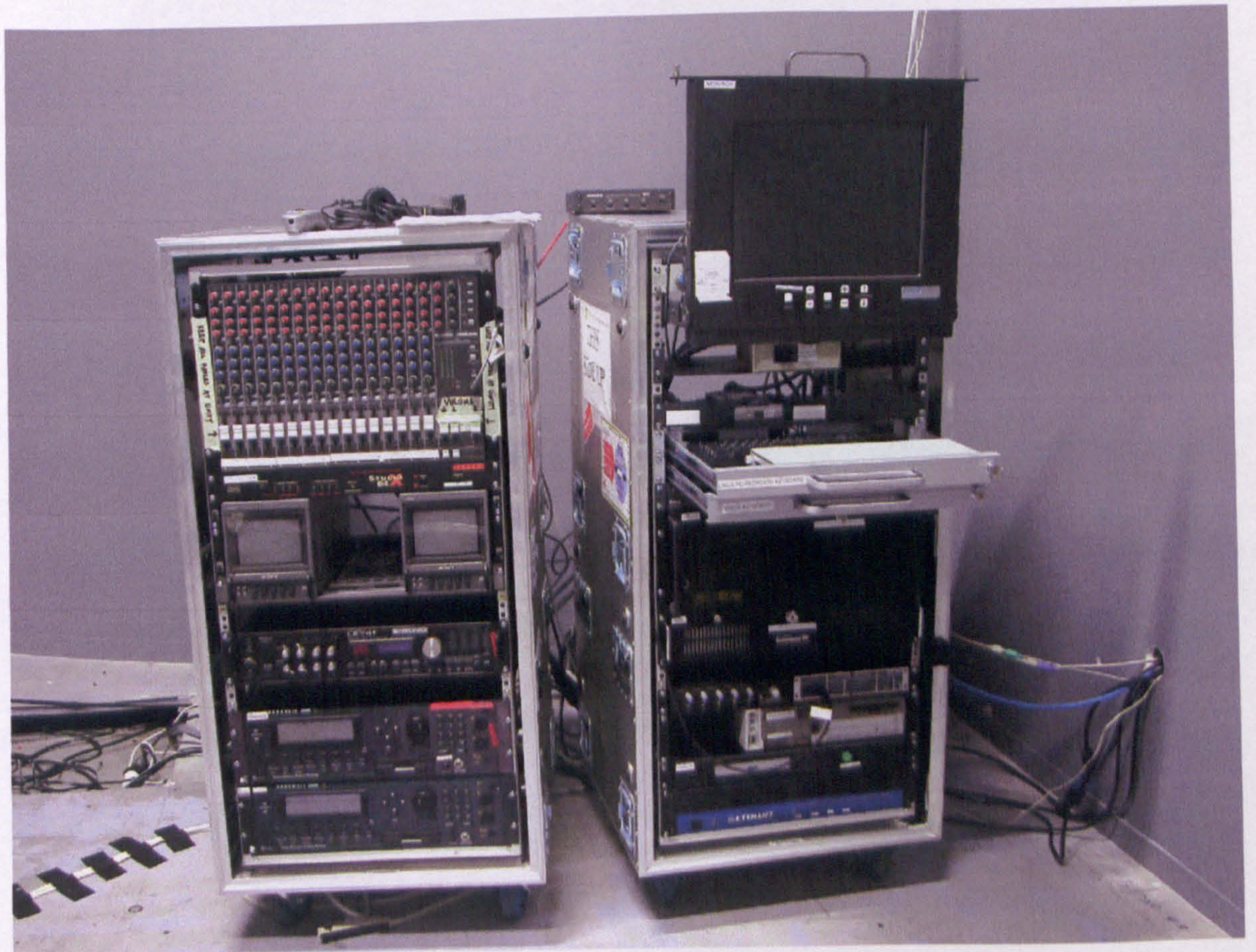
(Below) Osmose/Ephémère Installation, Immersant Room, Head Mounted Display



(Below) Ephémère, Suiting Up Sequence, Australian Centre of the Moving Image, Melbourne Australia, 2003.



(Below) Osmose/Ephémère Hardware



II

Graphics & Interaction Programming Summary by John Harrison, 2002

Introduction

Ephémère was a ground-breaking technical achievement, building on the successes of Osmose.

Ephémère started with the Osmose code base, which was written with the aid of Softimage's SAAPHIRE and DKit development libraries, as well as SGI's Performer and OpenGL (translated from the original GL code of Osmose). The same parallel processing model was used for Ephémère as was used for Osmose, with the separation of the Application, Cull, and Draw processes as well as separate processes for each of the device drivers. However, no particle animations are done in Ephémère.

In preparation for Ephémère, the Osmose software was first optimized to run on a single-pipe Onyx InfiniteReality deskside (instead of the massive three-pipe Onyx RealityEngine2 Rack). Once this was done, the Osmose code was used as the basis of the program that eventually became Ephémère.

Like Osmose, Ephémère uses a Division DVisor HMD, a Polhemus Fastrak, a custom breathing vest, and a variety of sound equipment. Unlike Osmose, at the request of our composer Rick Bidlack, a PC was used to control the sound rather than a Macintosh.

Ephémère's software goes far beyond Osmose, however, partly because of shortcomings we'd found in the Osmose software, and also because of the special requirements of Ephémère.

Ephémère requirements

In Osmose, we found that the software was unwieldy for small changes. For example, if we wanted to change the colour of an object, we would have to stop the program, possibly recompile it (depending on whether the colour was specified in the code or in the data files), and then start it again, waiting the several minutes it took to load. This meant that each small modification could take 15-30 minutes to try out, which reduced the amount of experimentation we could do.

So, in Ephémère, we required that most changes to the virtual environment could be made without the need to restart the program.

Also, Osmose was essentially a static and non-interactive environment. The user would float through the spaces, but nothing really reacted to the user; all the interaction was in navigation.

In Ephémère, we wanted the objects to be much more interactive. For example, if you entered a rock, we wanted it to open up vast vistas. If you gaze at an object, it would react to you. We wanted many scenes to be visible at once, almost like veils; some can be entered, some not. We wanted flows that could be followed into different spaces, and have the materials of objects exposed and changeable in real-time. Finally, we wanted to be able to interactively change the speed of the user to give an illusion of viscosity.

In Osmose, there is not really a sense of time passing or objects changing - there's only a subtle day/night visible in the clearing.

In Ephémère, we also wanted to illustrate the passage of time more strongly. As a user experienced Ephémère, we wanted him or her to go through a year, starting and ending in winter, with all objects changing according to the seasons. We also wanted to illustrate several day/night cycles in that time, with associated changes.

Implementation of the requirements

When I looked at the list of requirements for Ephémère, I realized that the Osmose engine simply could not handle the complexity we required. However, I was not sure how to create a flexible approach that would allow all the interactivity we required.

After a great deal of brainstorming, I decided to use the technique of having separate programs running for each of the objects and scenes in the system, all interpreted in parallel (I chose interpretation rather than compilation, since it allowed us to update the programs while the system was still running - see below). For efficiency, every keyword in these programs was tokenized, and

stored in a data structure as a single byte. This data structure could be quickly scanned, and the appropriate actions taken.

Transitions

I wanted to have complete control over transitions for scenes and objects. Any object could cause another object to transition, and could load any other object or scene. I was particularly concerned about the transitions from above-ground to below-ground, as we wanted as smooth a transition as possible, yet each of these could be extremely complex scenes – and having all the objects in the above-ground and below-ground visible at once would bring everything to a grinding halt.

I solved this problem by having each object or scene have a "FadeValue" associated with it. This is a value which gradually goes from 0.0 to 1.0 as the scene fades in, and from 1.0 to 0.0 as the scene fades out.

Associated this was a separate program for each object or scene which could be run at each stage of the fade process. Each scene had specified (optional) procedures for: pre-fade-in, fading in, and post-fade-in (there could be two versions of this – one when fading to the full scene, and one for when the fade in is aborted (i.e. it was partially faded in, then faded out again). Then, the scene would go to its main application loop (which, by the way, could also be called by the fading in procedure so that the scene would be active as fading in). As the scene fades out, it executes procedures for pre-fade-out, fading out, and post-fade-out (again with 2 versions – one for when it fades out completely, and one for when it has partially faded out, but then faded back in).

With this mechanism, I could easily control the fading in and out of scenes. For example, in the above-ground scene, objects would fade out at different speeds. For example, as the above-ground faded out from 1.0 to 0.5, I would have it fade out one of its rocks from 1.0 to 0.0 (this is simple; I just fade the rock using a RockFadeValue of $2 * (\text{SceneFadeValue} - 0.5)$). In this way, I made sure about half the objects were faded out when the scene was only half-faded out, and all the objects faded out when the scene was fully faded out. Similarly, the below-ground scene would have different fade-in values, so that some things were faded in during the first half of the fade, and others at the last-half. This meant that during a transition, the overall number of objects drawn at any time is more-or-less constant, so that the frame-rate is not impacted.

Since each object has a unique program associated with it, each object in Ephemère can "watch" other objects, the user, the time, etc., and alter its own behaviour according to these parameters. Each object can also create other objects and control them as needed (so that entire scenes can be built up in a hierarchical fashion).

Sounds could also be created and manipulated using this programming language.

In this way, we were able to specify very complex behaviours and interactions.

Examples

Following are some very simple examples of two scenes – one which defines a cluster of "seed rocks" in the underground, and one which defines a single seed rock (these are the objects that are all nested together and rotate around and change colour as the seed blooms). I've added some annotations to explain a little bit about what's going on; a much more comprehensive description would be necessary to fully explain how this works.

```
; definition for the scene seedrocks
BeginScene seedrocks
(
  ; this is a list of the parameters to this scene; first the
  ; constants, then the variables
  ShowRocks ; flag to indicate whether or not to show the rocks
  RotX RotY RotZ ; rotation of this set of rocks
  ;; any items after here are parameters that can be changed
  X Y Z ; the XYZ position of these rocks
  aliveness ; how "alive" the rocks are
  alphaval ; how solid-looking the rocks are
  Scale ; the scale of the rocks
)
; next is a list of local variables
```

*SceneArray rocks (NSEEDROCKS) ; and array of rocks
FloatVar cnt ; a counter*

*; following are the commands to be executed before fading anything in
PreFadeIn*

*; add NSEEDROCKS rocks
Set cnt 0.0
While < cnt NSEEDROCKS
; add a seedrock scene
AddScene "seedrock" rocks (cnt) (
cnt RotX RotY RotZ ShowRocks :
X Y Z aliveness alphaval Scale
) MyGroup
; increment the counter (note that we use Reverse Polish
; Notation for math – it is quicker to interpret.
Set cnt + cnt 1.0
EndWhile
EndPreFadeIn*

*; following are the commands executed as the scene fades in
FadeIn*

*; fade each of the rocks in as much as we are faded in
Set cnt 0.0
While < cnt NSEEDROCKS
FadeScene rocks (cnt) FadeVal
Set cnt + cnt 1.0
EndWhile
EndFadeIn*

*; following are the commands executed as the scene fades out
FadeOut*

*; fade out each of the rocks as much as we are faded out.
Set cnt 0.0
While < cnt NSEEDROCKS
FadeScene rocks (cnt) FadeVal
Set cnt + cnt 1.0
EndWhile
EndFadeOut*

EndScene

*; This is the scene defining a single seed rock
BeginScene seedrock*

*(
which ; which rock in the group we are
RotX RotY RotZ ; our rotation
ShowRocks ; global parameter should rocks should be shown
:
X Y Z ; our position
aliveness ; how "alive" we are
alphaval ; how solid we appear
Scale ; our scale
)*

*SI_Scene /disk1/FLUX_3 seed_ext.2-0 ; the softimage scene to use
; some local variables*

*FloatVar rot
FloatVar rotSpeed
FloatVar OffX
FloatVar OffY
FloatVar OffZ
TimerVar mph
FloatVar R
FloatVar G*

FloatVar B
FloatVar ColourChanged
FloatVar Weight
TimerVar Timer

PreFadeIn

```
; initialize locals
Set Timer 0.0
Set ColourChanged FALSE
; pick a random colour to use as the seed blooms
Set R * RANDOM 0.5
Set G * RANDOM 0.5
Set B * RANDOM 0.5
Set rot 0.0
; pick a random rotation to use as the seed blooms
Set rotSpeed * - RANDOM 0.5 2.0
Set OffX * - RANDOM 0.5 3.0
Set OffY * - RANDOM 0.5 3.0
Set OffZ * - RANDOM 0.5 3.0
; set up position and rotation and colour for rock
ScenePosition X Y Z
SceneRotation RotX RotY RotZ
SceneMaterialAmbient 0.0 0.0 0.0
SceneMaterialDiffuse 0.0 0.0 0.0
SceneMaterialSpecular 0.0 0.0 0.0
SceneMaterialEmission
SEED_ROCK_EMISSION_R
SEED_ROCK_EMISSION_G
SEED_ROCK_EMISSION_B
EndPreFadeIn
```

FadeIn

```
; as we are fading in, do the action loop
DoAction
EndFadeIn
```

; the action loop

```
Action
; if the seed is blooming, start changing colour
If NOT ColourChanged
If > Timer TIME_TO_START_COLOURCHANGE
If < Timer TIME_TO_END_COLOURCHANGE
Set Weight / - Timer TIME_TO_START_COLOURCHANGE
- TIME_TO_END_COLOURCHANGE
TIME_TO_START_COLOURCHANGE
SceneMaterialEmission
+ * - 1.0 Weight SEED_ROCK_EMISSION_R * Weight R
+ * - 1.0 Weight SEED_ROCK_EMISSION_G * Weight G
+ * - 1.0 Weight SEED_ROCK_EMISSION_B * Weight B
Else
Set ColourChanged TRUE
SceneMaterialEmission R G B
EndIf
EndIf
EndIf
; rotate - and rotate faster as we are move alive
Set rot + rot * rotSpeed / aliveness 15.0
SceneRotation RotX + RotY rot RotZ
; setup the scale
SceneScale
* Scale / SEEDSIZE 2.0
* Scale * SEEDSIZE + 0.5 / 30.0 60.0
* Scale / SEEDSIZE 2.0
```

```

; do different alphas depending on the aliveness
If < aliveness 2.0
  Set mph 0.0
  If ShowRocks
    SceneAlpha * FadeVal * alphaval + 0.2 * aliveness 0.4
  Else
    If < aliveness 1.0
      SceneAlpha * FadeVal * alphaval + 0.2 * aliveness 0.8
    Else
      SceneAlpha * FadeVal * alphaval - 1.0 - aliveness 1.0
    EndIf
  EndIf
EndIf
If >= aliveness 2.0
  If ShowRocks
    SceneAlpha * FadeVal * alphaval 1.0
  Else
    SceneAlpha * FadeVal - 1.0 * alphaval 1.0
  EndIf
EndIf
; update our position
ScenePosition
+ X * OffX / aliveness 30.0
+ Y * OffY / aliveness 30.0
+ Z * OffZ / aliveness 30.0
EndAction

FadeOut
; do the action loop as we fade out
DoAction
EndFadeOut
EndScene

```

Reloading Scenes without stopping the program

Before starting the development of Ephémère, I attended SIGGRAPH '96, where I attended the session presenting "Disney's Aladdin: First Steps Toward Storytelling In Virtual Reality (Randy Pausch, Jon Snoddy, Robert Taylor, Scott Watson, Eric Haseltine, ACM SIGGRAPH '96 Conference Proceedings, Computer Graphics, August 1996). Here, Randy Pausch emphasized that they could not have developed their system without fast prototyping, a major feature of which was being able to reload their program without having to wait a long time after altering the content.

I applied this same paradigm in the development of Ephémère, allowing us to reload programs and scenes without having to stop the application – we just paused it for a moment, loaded the new data, and then restarted the experience from the beginning without having to wait for all the programs, models, textures, etc. etc. to be reloaded. This really sped up our development time.

The Working Process

I think that software limitations can actually enhance the working process – since there are few choices at any point, it is easy to find a path to the solution (if one exists at all). The software for Osmose was very limited, so the working process was quite clear.

The software for Ephémère, however, was much more flexible – which resulted in making the working process much more difficult since the possibilities seemed almost limitless at any point.

We tried to overcome this difficulty by simplifying the design of Ephémère. Sketches and Ideas were worked out on a whiteboard, always with the goal of somehow finding an efficient way to describe the environment to each other. For example, we eventually decided to have three main "worlds" (above ground, below ground, and body) which were layered in space, and which each changed over time – but with no interaction between objects in different worlds. This helped simplify our discussions by limiting the possibilities. Similarly, several special effects (e.g. the sprouting of the seed, and moving from a rock into a landscape) were envisioned, but treated as independent units to be dropped in for a certain amount of time in each of the scenes. Again, this is limiting, but it results in making the working process much easier.

A second difficulty with the software for Ephémère was building up complex scenes, since each object was running its own program – and potentially controlling other objects. Since we didn't create a good way to specify behaviours hierarchically, this resulted in the code becoming very complex, making it difficult to debug for any given scene.

To simplify this, I created a higher level (and once again significantly limited) way of specifying objects and behaviours. This method was simple enough that Char and Georges could work on their own to define the timing of scenes – adding objects, defining when they would appear and disappear in the scene, and structuring the overall flow of the work. Meanwhile, I could concentrate on the programs for each of the objects, as well as improving the Ephémère engine.

Following is an example of this simplified specification technique. This gives the scene or object number (positive to fade it in, negative to fade it out), the time it is to be faded in (or out), and the length of the fade. Also, they specify fractional fade values (so that if the main scene is being faded in, these scenes can be faded in slightly later or faded out slightly earlier than the rest of the main scene). Some lines also have a vertical range, so that the given scene is only visible if the user is within a certain height range. All times are in seconds. Each line is followed by an explanation of the numbers.

160123 30 0.02 1.0 < 20 -50 >
; At 160 seconds, fade in the stars scene (scene 123) over 30 seconds. The stars should only be visible if the user is between a height of 20 units and -50 units. The star scene should fade in ever so slightly later than the main scene (once the main scene is faded in by 2% (0.02)).

240-123 15
; At 240 seconds, fade out the stars scene over 15 seconds.

40 309 15 0.03 1.0 ; Trees winter
; At 40 seconds, fade in half the winter trees (scene 309) over 15 seconds. Again, it should fade in more-or-less at the same time as the main scene if the user changes scenes, coming in after the main scene is faded in by 1%.

40 309 15 0.55 1.0
; At 40 seconds, fade in the other half of the winter trees (scene 309), also over 15 seconds. However, when the main scene fades in, the trees should only fade in when the main scene is at least 55% faded in. This will help the framerate.

250-309 15
; At 250 seconds, fade out the first set of winter trees over 15 seconds
825-309 10
; At 825 seconds, fade out the second set of winter trees over 15 seconds.

100321 30 0.04 1.0
; At 100 seconds, fade in the swamp river (scene 321).

199-321 30
; At 199 seconds, fade out the swamp river

160335 15 0.05 1.0
; At 160 seconds, fade in the swamp ground
244-335 15
; At 244 seconds, fade out the swamp ground

This simplified specification file runs to hundreds of lines, specifying the behaviour of all the scenes and objects in the environment in a high-level way.

The use of this specification file, as well as the complex, interpreted language to specify objects and scenes and to re-specify them on-the-fly was very powerful and helped shorten the development cycle of the work. Unfortunately, it also led to some stability problems, since these programs were so difficult to debug. This resulted in occasional mysterious crashes* during installations, which is something that we didn't see with Osmose.

To fix these problems, now that the behaviours are completely specified for the objects, we could possibly rewrite Ephémère so that it no longer uses the Interpreted language. Alternatively, better error checking could be implemented so that when things go wrong the result is not a crash. And perhaps the best solution might be to completely encapsulate each object using true object-oriented programming techniques rather than the hybrid solution we used. Unfortunately, there was not time to complete these tasks before the installation deadline for Ephémère.

Conclusion

On my first day of working for Char, I let her know that the most exciting thing for me in any job is meeting a challenge. Ephémère certainly provided that challenge, and though the resulting program is not perfect, it does manage to convey what we originally intended, creating complex and compelling experiences for all who experience it.

* In the summer of 2002, I finally tracked down the source of the mysterious crashes in Ephémère. Since the crashes seem to occur at random, I wrote a number of routines to simulate a person moving through Ephémère, and often had to leave this "stress-test" running for hours before a crash occurred. After a very detailed investigation over a period of months, I finally found the bug. It turned out that SGI's Performer occasionally uses the first four words of allocated memory as a flag. If those first four words have a specific value (which happens to be the binary representation of the float number 7,300453), then that memory block would effectively be deleted. So, every time the first number in an allocated memory block was set to precisely 7,300453, the next time that memory location was accessed the program would crash. The reason that the crash was so infrequent was that this precise number would come up, on average, only once every 4.2 *billion* allocations. In the end, I wrote a hack in Ephémère so that if ever the exact number 7,300453 came up, it would be changed to 7,300454. This fixed the crash, and Ephémère has been stable ever since.

Sound Design Programming Summary by Dorota Blaszcak, 2002

Audio for Ephémère is based on a complex system that gives enough flexibility to create rich sonic space connected tightly to the graphics. Its structure comes from the experience from previous VR projects that had too many sound limitations.

The sound system consists of a software part (on the Onyx and PC computers) and an audio hardware part (for sound generation, processing, sound spatialization and mixing).

All selected control signals from the sensors and the graphic environment go to the audio program on the Onyx. The signals are filtered to obtain useful information and then used for audio space composition and interactions. The program contains the description of the behaviors of an audio space and audio objects in space. It assigns the voices to audio space objects and specifies their responsiveness to the immersant and the environment. It also controls the spatialization of selected sounds, controls additional processing and does the final mix for the headphones.

The program uses both C and John Harrison's programming languages. In previous projects I had to program all the time transitions for sounds and audio scenes - the graphics were quasi-static. This time, in Ephémère, John's language is based on time envelope of life of a particular element and it can take care of both audio scene and an individual sound.

A special handshake-like protocol is used to send specific data from the Onyx to the program on the PC. It wasn't enough to use more simple protocol from previous projects because of the complexity of Ephémère. This new protocol allowed us to keep track of the realization of the audio commands and prevent an attack and release of the sound from cutting and wrong processing.

The data from the Onyx was used as parameters for the voice algorithms of the audio program on the PC. This program is responsible for sound generation itself. The composer Rick Bidlack did the whole design and implementation of the program. He also created the compositional algorithms for each voice that we hear in Ephémère. As the result, the program sends a stream of MIDI data to two samplers to play the sound.

The samples used in the samplers as source sounds are based on various viola sounds, animal and environmental noises and simple signals. Those original sounds are changed through the algorithms of sequencing and processing.

All the audio equipment is controlled by MIDI signals to change its various parameters in real-time. The audio stream from the samplers (two Kurzweil K2000) consists of two stereo and eight mono signals. The latter ones go through the spatialization process (Acoustatron). We also used an additional processing like reverberation, delays, chorus, pitch shift (Ensoniq DP/4+). Everything is mixed together (Mackie CR-1604 and OTTO-1604) to get two-channel output for the headphones for the immersant. The same signal is used for the speakers in the public room.

The most important part of the working process was the possibility of a rehearsal similar to the "traditional" music pieces. John's interpreter language allowed me to rehearse separately each audio object in space in the Ephémère project. Then I could test more and more objects together before I worked on the whole scene.

Since we had to work on the sound without the whole graphic system available, there is a simulation of necessary control signals prepared for the rehearsal purposes. Such a testing module had to include initialization of all sounds and parameters, the start of the piece from any scene, and display of all necessary parameters. It always required much time to write an additional code for the rehearsal but it was necessary for working on the project.

The whole process of creating sound for virtual environment projects is really challenging. Unlike in linear media, everything is happening here in real-time and the sound comes from the movement of the environment and the immersant - you need to look for new categories of sound and new means of expression.

We use several types of sounds that belong to the following categories:

1. Sounds of the immersant, of a graphic object, of an invisible object or of a scene.
2. Mono, stereo or localized sounds.

3. Periodic or one-shot sounds.
4. Sync groups of sounds driven by the same compositional algorithm.
5. Sounds exempted from various processing.
6. Mixing groups of sounds always faded out together.

All the sounds in the environment are organized as sound objects, which describe the behavior of the sound in the space as a response to the Immersant motion and to the environment behavior. This new means of expression can be found through exploring that sound response.

A few examples from the Ephémère environment:

- In general, you can hear (and see) more if you pay attention to the environment
- some objects that you are passing by, can "call" you to draw your attention to them
- if you spend some time in front of a rock, you start hearing (and seeing) its "story" and after a while you are surrounded by its sound and image, then everything comes back to an initial environment – that response to the Immersant's concentration on the rock tries to show the changes of perception when you are immersed in attentive contemplation.
- each time you move to another scene with the river, you carry with you one layer of the sound from the previous scene – It is an attempt to show the memory of past events
- when you look towards the sun or the moon, all the sounds become more reverberant – to emphasize the perception of the light of those objects.

These relations between sound and graphics can be difficult to notice when you are in the environment for the first time. But if you go through Ephemera several times, each time you can discover something new. You learn to notice details of the sound space and localized sound.

Ephémère is a very important piece for me because we have managed for the first time to realize many of my sound ideas for virtual environment.

The Sound World of Ephémère by Rick Bidlack, 1998

Let us begin at the beginning, by addressing the question: just what are we hearing when we listen to Ephémère?

There are four major categories of sounds. First there is a viola (my viola in fact), from which we have a number of different sounds, some traditional, some not. There are normal bow strokes, some more marcato strokes, bouncing bow strokes (spiccato and ricochet), plucked strings (pizzicato), strokes played on the bridge (sul ponticello), a rapid back-and-forth stroke known as tremolo, and an unusual effect in which the string is hit with the stick of the bow (col legno battuto). In a less traditional vein, there are light taps with the knuckles on various parts of the body of the instrument, some rustlings in the peg-box, plucking of the strings behind the bridge, that sort of thing.

The second sound category is comprised of noises from animals, specifically: cat, chimpanzee, frog, cockatiel, katydid, guinea pig, otter, snake, bat, sea lion, cricket. Included in this group is also a flutter of wings. These sounds were chosen from a much larger collection based simply on their subjective interest.

The third category is a collection of more-or-less non-pitched noises: running water, breaking sticks and branches, breaking vegetables, several rock slides, fire, rain, wooden wind chimes, bubbles from a scuba diver, thunder.

Finally, there are two special classes of sounds that are used, and these are pure sine tones, and white noise. These are special in the sense that they are not taken from the real world, but are synthesized electronically (well, digitally actually). They are used for making the "wind" that one hears in the above-ground scenes, by filtering the white noise, and adding the sine tones to produce an eerie whistling quality during the winter and the ending.

It is immediately clear from listening to Ephémère, however, that virtually none of these sounds is recognizable as such. Therefore the next questions are: what is being done to the sound to disguise it, and why?

One of the most effective means of altering a sound is to displace its pitch, that is, to reproduce it at a faster or slower rate, which has the effect of respectively raising or lowering its pitch. There is an attendant time change which occurs with this process: the lowered pitch results in a longer sound than original, and the raised pitch produces a shorter sound. These effects are familiar to anyone who has played a 33rpm vinyl record at 45rpm (or vice-versa) – If you are old enough to remember that particular technology. (For the technically inclined, there are sophisticated means available to raise or lower pitch without scaling time, or to scale time without altering pitch, but these were not used in Ephémère.)

Another method for changing a sound is to remove its "attack," which is to say, the initial portion of the sound. It is a strange but true fact that most of the identity of a sound comes from this initial portion: a sound may become virtually unrecognizable simply by removing the first tenth of a second of its natural evolution. Attack removal is actually a subset of a more general process wherein the evolution of the amplitude (loudness) of the sound is subjected to a scaling function. In other words, we design amplitude envelopes and impose them upon the original sound. A visual analogy might be the cropping of a photograph. Both attack removal specifically and envelope scaling in general are used in Ephémère.

Other means for transforming sound employ filters (similar to the tone controls on most amplifiers and car radios, but with much more drastic effects), delays (echo), and artificial reverberation (the sum of many, many echoes of varying lengths, along with judicious use of filters, to simulate the effect of a sound in an enclosed space).

Collectively, these manipulations of the sound are called "processing." A sound is said to be processed when it undergoes any of these transformations, as well as many other kinds of transformations which I have not described, and which were not used in Ephémère.

Additionally, there is one other very specialized stage of processing which was used, which we call localization or spatialization. This is a technique which attempts to simulate the aural effect of a sound which is localized in three-dimensional space, and is most effective when heard over

headphones. Localization goes beyond "stereo," but it is also intended primarily for the Immersant, who per force hears the sound through headphones that are built into the helmet. The use of localization in *Ephémère* is covered in a separate paper by Dorota Blaszcak.

Why, then, are the original source sounds disguised beyond recognition? Well, precisely so that they aren't recognized. Sounds are as recognizable as words, and carry with them all kinds of emotional and contextual baggage which we did not want to impose on the world of *Ephemera*. The sounds we used provided us with a very rich palette to begin with; their transformation allowed us to use them without fear of the injection of extraneous meanings in our virtual world.

Next, we ask, by what mechanism are the sounds played and processed? We use a specialized machine called a sampler, which works on the same principle as a CD player, except that it has the ability to instantaneously locate (on its internal disc) and play any of the large set of pre-recorded "samples" of acoustic materials which I discussed at the beginning. In addition, it can vary the playback rate to affect pitch, it can impose amplitude and pitch envelopes, and it contains a wide array of on-board filters, including ambient reverberation. The sampler can do any and all of these things on demand, and furthermore, it can do them to many sounds simultaneously and independently of one another.

The sampler and the samples contained within it comprise the sound-production mechanism, the "orchestra" if you will. The next question is, who (or what) plays the orchestra?

This is a very interesting question, for we finally come to the heart of the matter. The "score" to *Ephemera* is a set of behaviors codified and assembled into a computer program. Various objects, places and situations in the virtual world are represented by software "objects" (parts of the program) which are responsible for the creation and potential evolution of particular sound events (e.g. falling trees, a stream, a passing flock, the general sound of being underground or in the body, etc.).

There are 30-something different sound objects in *Ephemera*, each of which may vary its behavior tremendously depending on the circumstances of the Immersant's motions in the virtual space, as well as characteristics and behavior of that space itself. In *Ephémère*, the program which codifies the behavior of the sound is actually split into two different programs, because they each run on a different machine. But in metaphorical terms, we can think of there being one "sound machine" and one "graphics machine."

Let us examine a few specific cases. If the Immersant is in the above-ground space represented as a kind of virtual forest, and he/she stares long enough at one of the many trees, a ghostly image of a tree falling will appear. This tree falls for three seconds (that is the duration of its fall from the moment it is first seen until it disappears). The fall is accompanied by a sound - any of seven sounds, actually -- which have all been carefully chosen to convey a general impression of a tree falling in the woods, and which last for three seconds, more or less. What happens is that the machine which is generating the graphic images sends a signal to the machine which is creating the sound, and the signal is one which says "there is a tree starting to fall." The sound machine then chooses randomly (in this case) from its repertoire of falling tree sounds, and commands the sampler to play that particular sound. That's a very simple case, what we came to call a "one-shot" sound, i.e. a sound which is told to start, it happens once, and then stops.

A more complex and subtle example is the ethereal, shimmering, high pitched sound which accompanies the Immersant as he/she is drifting through the above-ground forest. This sound is what we called in general a "body" sound - it is intimately connected to the movements of the Immersant. In this case, the sound consists of a chord of three pitches. As the Immersant moves through the virtual space, we track his or her motion across the lines of an invisible grid. As each line is crossed, one or more of the pitches of the chord is changed. An additional detection mechanism looks for especially rapid motions of the Immersant's head, and produces a similar change of chord in response. In this way, an Immersant who remains basically stationary will produce a constant, never changing chord, while someone who is quite active and explores the space will produce a much more varied sequence. But this body sound is also connected to the space itself. There is a "fog" which drifts through the space, the density of which varies quite a bit.

We have mentioned several times the fact that various aspects of the behavior of a sound can be dependent on the motions of the Immersant. Is the Immersant aware of this? Are other observers/listeners aware? To be honest, probably not, at least at first. In some instances we

believe it is likely that with sufficient experience, the Immersant would in fact begin to notice a direct connection between his/her movements and the sound produced, but this is not likely to occur within the 15 minute time span that most people are engaged in the piece.

In point of fact, the apparatus of the Immersant (the vest, the helmet and all the sensors) does not quite constitute what one would call an instrument, in the sense that a violin is an instrument. Should it be? That's a very interesting question, and our answer is basically no, for a practical reason: instruments require time on the order of years to attain proficiency, and the average immersant only gets 15 minutes. [Again, this is a practical consideration: at 15 minutes plus another 5 for the donning of vest and helmet, a gallery can put three people per hour into the piece, or 24 in an eight-hour day. We are constrained by the medium from "packing them in."] You probably wouldn't want to listen to a beginning violinist struggle with the complexities of that instrument for longer than a couple minutes. So it is simply not practical to put a person into a complex sensory apparatus and expect meaningful interaction without a great deal of training over a long period of time.

Nonetheless, we wish to create an environment in which the Immersant feels she/he has some influence in the creation of his/her experience. But what if the Immersant simply stands there and does nothing at all? This actually does happen, it is not at all uncommon; a conservative estimate would be that between 5 and 10 percent of all Immersants interact very little or not at all. In a situation like that we would still, as artists, like to create a meaningful aesthetic experience, in other words, we can't allow nothing to happen at all just because the Immersant behaves like a deer caught in the headlights. At this point in the history of VR (i.e. the very beginning), when there is no established practice either for making or experiencing immersive works, it would seem quite natural and understandable for someone to approach the job of perception of the work with the closest tools they have, which at this point in time happen to be those that we have learned in our many years of watching film and television. And in watching film, we know that we can be deeply engaged in the experience without exhibiting the slightest physical motion at all. It is therefore misleading to read an Immersant's apparent lack of physical interaction with the work as lack of interest or engagement. And for this reason we cannot "punish" a non-responsive Immersant with a non-score: something must happen, no matter what the Immersant is doing or not doing.

Our solution, then, is a kind of qualified fence-straddling. We do tie certain data from the Immersant directly to the behavior of the sound. For example, the Immersant's "speed" through the virtual space is mapped to the volume of the wind (in the above-ground scenes), but not completely: there is always a little wind volume anyway, just to make sure that it is there. We tie the motion of the Immersant through a virtual grid to changes in harmony or rhythm, but not completely: if the Immersant remains still for too long, we change the harmony or rhythm anyway. In this sense we have a kind of "activity monitor" that will certainly effect the score as it is produced, but which is not the only effector of the score. We hope the sound is thus perceived as live and responsive to the situation, but will still allow periods of quiet drifting and introspection.

We are also limited by the number and type of motion sensors which are employed. One can naturally envision hundreds of sensors, perhaps sewn into a full body suit, but this has so many drawbacks, especially from the perspective of trying to immerse as many members of the public as possible, as to be completely impractical. The solution used in Ephemera, with one on top of the head (built in to the helmet), and one each at the top and bottom of the spine (built into the vest), is actually amazingly versatile in terms of the amount of information that can be gleaned. Through experience, we found the following parameters of motion to be most useful to the musical needs: head elevation (looking up or down), head azimuth (which direction the head is pointing), head rotation speed (how quickly the Immersant is moving his/her head from side to side), and "user speed" (how quickly the Immersant is moving in the virtual space), which is a product of several other factors, the most important being change in X/Y/Z position over time, and amount of leg bend. When these are added to "environmental parameters," such as amount of fog, time of day/season (these are equivalent in Ephémère), distance from a given object, angle to an object, or the mere proximity of an object, we have more than enough variables to work with.

Appendix II

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Landscapes of Ephemeral Embrace

A Painter's Exploration of Immersive Virtual Space As a Medium for Transforming Perception

By

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in partial fulfillment for the degree of

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Accompanying Essays

VIRTUAL SPACE BY CHAR DAVIES

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.

J. Gasquet, *Cezanne*,
quoted by Merleau-Ponty, *Eye and Mind*

I have been working in "virtual space" for nearly 10 years, and during that time have produced two major works, the virtual environments *Osmose* (1995) and *Ephémère* (1998)¹. Integrating full body immersion, interactive 3-D digital imagery and sound, and navigation via a breathing interface, these works embody a radically alternative approach to immersive virtual space, or what is commonly known as "virtual reality" or "VR". Rather than approaching the medium as a means of escape into some disembodied techno-utopian fantasy, I see it as a means of return, i.e. of facilitating a temporary release from our habitual perceptions and culturally-biased assumptions about being in the world, to enable us, however momentarily, to perceive ourselves and the world around us *freshly*.

It should be noted that when I say virtual space, I am referring to *immersive* virtual space, i.e. a computer-generated artificial environment that one can seemingly, with the aid of various devices, go inside. I think of virtual space as a spatiotemporal "arena" wherein mental models or abstract constructs of the world can be given virtual embodiment (visual and aural) in three dimensions and be animated through time. Most significantly, these can then be kinesthetically explored by others through full body immersion and real-time interaction, even while such constructs retain their immateriality. Immersive virtual space is thus a philosophical *and* a participatory medium, a unique convergence in which the immaterial is confused with the bodily-felt, and the imaginary with the strangely real. This paradox is its most singular power. The firsthand experience of being bodily immersed in its all-encompassing spatiality is key: when combined with its capacity for abstraction, temporality, and interaction, and when approached through an embodying interface, immersive virtual space becomes a very potent medium indeed.

Between 1995 and 2001, more than 20,000 people have been individually immersed in the virtual environments *Osmose* and *Ephémère*. A common response to the experience is one of astonishment: many "immersants" have described their experience in euphoric terms while others have inexplicably wept. As one participant wrote six months afterwards:

[This experience] heightened an awareness of my body as a site of consciousness and of the experience and sensation of consciousness occupying space. It's the most evocative exploration of the perception of consciousness that I have experienced since I can't remember when.

Such responses suggest that immersive virtual space, when approached in an unconventional way, can indeed provide a means of perceiving freshly. The medium's paradoxical qualities may effectively be used to redirect attention from our usual distractions

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, 3-D sonic architecture; and Rick Bidlack, sound composition.

and assumptions to the sensations of our own condition as briefly embodied sentient beings immersed in the flow of life through space and time.

Virtual Space and King Logos

Many centuries after Copernicus and Galileo's dismantling of the terra-centric universe, we still refer to the sun rising and setting on the horizon as if the earth were flat: similarly, many decades after Einstein's relativity theory, in everyday life we continue to conceptualize the world around us in terms of the old Newtonian/Cartesian paradigm, i.e. as an aggregate of solid separate objects in empty space. As Roger Jones wrote in *Physics as Metaphor* (1982):

The modern notion of space is a compound metaphor that embodies all our concepts and experiences of separation, distinction, articulation, isolation, delimitation, division, differentiation and identity. The laws of perspective and of geometry for us are a codified summary of our normal experience of alienation, unique identity, and un-relatedness. It has all been abstracted, externalized, and synthesized into the cold, empty void we call space. This metaphor of space is our modern mechanism for avoiding the experience of oneness, of the chaos, of the ultimate state of unity to which the mystic seers and philosophers of all ages have referred.

Conventional ways of thinking about and producing immersive virtual space faithfully mirror this metaphor. 3D computer graphic techniques, as commonly used in VR environments, tend to rely on 3D Euclidian geometric models, Renaissance perspective and the xyz coordinates of Cartesian space, all applied in a never-ending quest for visual realism. The resulting aesthetic/sensibility (what I call the "hard-edged-objects-in-empty-space" syndrome) reflects a dualist, objectifying interpretation of the world. When these techniques are combined with what have already become conventional methods of user interaction (such as hand-held joysticks, pointers, gloves, etc.) the effect – regardless of content - reinforces a particular way of being in the world in terms of mastery, domination and control.

It is important to understand that virtual space is not neutral. The origins of the technology associated with it lie deep within the military and western-scientific-industrial-patriarchal complex. It should not be surprising then if the medium not only reflects these values but by default, reinforces what Henri Lefebvre, in *The Production of Space* (1991), calls 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."

In its most prevalent form, virtual reality can thus be considered a "literal re-enactment of Cartesian ontology" as Richard Coyne wrote in *Heidegger & Virtual Reality: The Implications of Heidegger's Thinking for Computer Representations* (1994). In conventional VR, the participating human subject is represented as an omnipotent, disembodied and isolated view-point, maneuvering in empty space (and often, at least in terms of increasingly immersive computer games, looking for something to kill...). Numerous other writers have analyzed the cultural bias inherent in the medium. For example, Ziauddin Sardar, in *Cyberspace as the Darker Side of the West* (1996), has called virtual reality a product of the collective unconscious of Western culture, suggesting it issues from "a technoutopian ideology ripe with subconscious perceptions and prejudices", in which "liberation from the body is sought by dissolving into the machine".

VR's tendency towards disembodiment should not be surprising either. As a realm ruled by mind, virtual reality - as conventionally constructed - is the epitome of Cartesian desire, in that it enables the construction of artificial worlds where there is the illusion of total control, where aging mortal flesh is absent, and where, to paraphrase Laurie Anderson, there is no "dirt". I believe such desire to escape the confines of the body and the physical world is symptomatic of an almost pathological denial of our embodied embeddedness in the living world. 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 but a testosterone-induced dream.

In the virtual environments *Osmose* and *Ephémère*, I have proposed an *alternative* approach to virtual space, intended to resist the cultural trajectory described above. With this intent, we have developed strategies such as an embodying user-interface which grounds the immersive experience in the participant's own breathing and balance. We have also employed semi-transparency in the visuals so as to create a perceptual ambiguity which might serve to dismantle the western "mis-perception" of the world.

My desire to accomplish this task, to propose an alternative, is rooted in my own particular experience of being in the world. Most importantly, this desire, and the strategies developed, have evolved through many years of artistic research into my own perception of light and space. I should also add that a decade spent within the software industry (1987-1997) as a founding director and head of visual research at a world-leading software development company (Softimage, whose software tools were used in Hollywood movies such as Jurassic Park and The Matrix) made me acutely aware of the technology's bias towards reinforcing a traditional Western worldview. This awareness further fueled my desire to push the technology and prove that it could indeed be used to express a different sensibility.

An alternative sensibility: a spatiality without things

How would the painter or poet express any thing other than [her] encounter with the world?"

Merleau-Ponty, *Signs*

I came to the medium of immersive virtual space as a painter, seeking a more effective means of communicating my sensibility of the world. My lifelong artistic project (now stretching over 25 years) has been to re-present the world as I have intuitively sensed it to be - *behind the veil of appearances* - as immaterial, interrelated and dynamic flux. Within this all-enveloping flux and flow, habitually perceived distinctions between things dissolve, and boundaries between interior self and exterior world become permeable and intermingled. This quest, to further understand my intuition and to effectively articulate it to others, is the driving force behind my work: *Osmose* and *Ephémère* are the most recent fruits of this endeavor.

Many of the strategies and aesthetic principles I have employed in my work are grounded in my own physiological experience of vision. My eyes are extremely myopic (at 17 "diopters", in layman's terms they require a thickness of 17 corrective lenses to see the world in focus with close to the same 20/20 "Mc-vision" acuity as everyone else). When "uncorrected" through prescription lenses, I encounter a radically different spatiality, in which normally perceived boundaries between objects and surrounding space are dissolved in light. Here, all semblance of hard edges, all sense of solid-surfaced separate objects, and all

distinctions between things, including figure and ground, near and far – the usual perceptual cues by which we objectify the world - simply disappear, dissolved into an ambiguous enveloping spatiality of soft, semi-transparent, intermingling volumes of varying hues and luminosities. This un-usual spatial sensibility bears a striking resemblance to Merleau-Ponty's description of night in *The Phenomenology of Perception* (1962):

When, for example, the world of clear and articulate objects is abolished, our perceptual being, cut off from its world, evolves a spatiality without things. This is what happens in the night. Night is not an object before me; it enwraps me and infiltrates through my senses, stifling my recollections, and almost destroying my personal identity. I am no longer withdrawn into my perceptual look-out from which I watch the outlines of objects moving by at a distance. [] it is pure depth without foreground or background, without surfaces and without any distance separating it from me.

In my own experience, such withdrawal of visual acuity - which so dominates our habitual perception of space - allows another way of "sensing" to come forward, just as Merleau-Ponty suggests. This is essentially a spatiality without "things", in which the threshold between interior self and exterior world becomes porous, and the separation between "out there" and "in here" is transcended. Whereas visual acuity tends to keep attention focused on what lies in front or ahead (i.e. the future), when it dissolves into a non-focused blur, one becomes aware of space as *all around*, bodily-enveloping as if one were immersed in the sensuous liquidity of the sea. Merleau-Ponty, in *Eye and Mind* (1964), also describes such space:

... no longer ... a network of relations between objects such as would be seen by a witness to my vision or by a geometer looking over it and reconstructing it from the outside. It is, rather, a space reckoned starting from me as the zero point or degree zero of its spatiality. I do not see it according to its exterior envelope; I live it from the inside; I am immersed in it. After all, the world is all around me, not in front of me.

When visual acuity is decreased, one also becomes more aware of sound: and sound, as an all-encompassing flux which penetrates the boundary of the skin, further erodes the distinctions between inside and outside. As the Australian sound theoretician Frances Dyson said at a conference in 1994, "metaphysically, sound has an ontology that challenges the solid world". Sound, like soft vision, also returns us to what I have come to call the "presence of the present". In this perceptual state, rather than being mentally focused on the future and thus inattentive, even absent, to the present, one becomes acutely aware of one's own embodied presence inhabiting space, in relation to a myriad of other presences as well.

Many of the key characteristics associated with my work, such as full-body immersion in an all-surrounding visual and auditory space, and the semi-transparent, dematerializing quality of the visuals, are thus grounded in my own experience of vision. While I could defer to various theoretical analyses of spatial perception, it is really through years of artistic investigation into my own bodily experience of space, through painting, that I have gained such insights.

From painting to immersive virtual space

While I began my career as a realist painter, taking great satisfaction in depicting the hard-edged boundaries between things, a chance turning of artistic attention to my own

perception of space led me to acknowledge, in 1981, this alternative sensibility. Subsequently, I began making studies from life without wearing corrective lenses. Over the years, this led to the development of the visual aesthetic of semi-transparency and semi-abstract/semi-representation used in *Osmose* and *Ephémère*. Below are several images I produced during that time, beginning with an example of one of my last realist works. In the still-lives, I was exploring the dissolution of form through light, and the ensuing erosion of perceivable boundaries between things. These studies culminated in paintings of glass jars on mirrors in which I was essentially painting the flow of light in volumous space.

This research eventually led to another, more abstract, body of work created between 1985 and 1987 and exhibited as *Espaces Entrelacés (Interlaced Space)*. I considered these paintings, some included below, as landscapes even though they were not created "from life". In these images, I was attempting to convey the experiential intermingling of the exterior flowing world and the interior perceiving embodied self, as well as communicate the subjective sensation of being enveloped in all-encompassing space.

Eventually however, the two-dimensionality of the painterly picture plane posed an insurmountable limitation, because I could not effectively articulate the sense of being all-enveloped, nor could I convey flux and flow. In the mid 80's, I saw an example of early 3D computer animation, consisting of phosphorescent green vector graphics against black space. In that short clip, I recognized the potential of the medium for my own purposes, and by the end of 1987 had become a founding director of the software company Softimage. I was interested not in the computer technology itself, but in the possibility of using it to create on the "other side" of the picture plane. Within a few years, I produced a series of 3-D digital images, collectively titled *Interior Bodies (1990-1993)*, which explored the metaphorical co-equivalence of nature and body. In these images, I adapted my previous painting techniques and used the software's lighting and transparency effects to circumvent the hard-edged polygonal models so characteristic of the technology and to create instead the soft spatial ambiguity I desired.

While these works were created with a 3-D software, they were reproduced as two-dimensional and static images, thus defeating my original intent. Intuiting that the immersive space of virtual reality might offer a more effective means of articulating my sensibility - and provide a way of enabling my audience to "cross over" the 2D picture plane with me, in 1993 I began to conceptualize an immersive virtual environment and put together a team. This work became *Osmose*.

The virtual environments *Osmose* & *Ephémère*

In the following pages, I will describe *Osmose* and *Ephémère*. But first, a caveat: these are bodily experiential works. As such they cannot easily be described in words or documented by the two-dimensional images that accompany this text: rather they are a mode of access to an ephemeral yet embodied experience of self and space, or rather *self in place*. To understand, one must really experience them firsthand: just as the sensations of becoming wet and buoyant can only be known by the swimmer, so these works can only truly be understood through subjective bodily participation.

To access their virtual spatiotemporal realms (at least in the current era, for the following methods will evolve as technology develops) one must dress in specific gear, as divers do. This includes donning an interface vest and a stereoscopic viewing helmet (known in the field as a head-mounted display or HMD). Inside the helmet are two small LCD screens which together create a stereoscopic effect, as well as stereo headphones. The vest and HMD

are linked through various cables to a computer and digital sound synthesizers/processor. As one looks around (including behind one's back and below one's feet), the computer calculates one's point of view and relative changing spatial position within the virtual realm via motion-tracking sensors in the interface vest and helmet, and, in response, generates the appropriate visual elements and aural effects in real-time, i.e. *on the fly*.

To navigate within *Osmose* and *Ephémère*, all one needs to do is breathe - breathing in to rise, out to fall - and shift one's centre of balance and lean in order to change direction. More technically speaking, we accomplished this by placing motion sensors on the participant's vest, to: a) track the expansion and contraction of one's chest as one engages in breathing, and b) to track the relative tilt of the spine as the participant leans one way or another.

This strategy, of having the immersive experience dependent on the intuitive visceral processes of breath and balance, was intended to counter conventional ways of navigating and interacting in virtual space. (Such techniques, by relying on hand-based devices such as joysticks, pointers or data gloves, tend to reinforce an instrumental, dominating stance towards the world.) Our approach was intended to counter the medium's bias with a vision of the medium as a channel for "communion" rather than control.

Our use of the participant's own breathing and balance for interface has many implications. As David Michael Levin wrote in *The Body's Recollection of Being: Phenomenological Psychology and the Deconstruction of Nihilism*:

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.

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.

In *Osmose* and *Ephémère*, the experience of breathing in to rise and out to fall facilitates a convincing sensation of "floating", as if the participant's body were gravity free. This un-usual sensation is intimately known by scuba divers, who use breath and balance to subtly control body buoyancy and maneuver in oceanic space. In *Osmose* and *Ephémère*, the sensation of floating tends to evoke euphoric feelings of disembodiment and Immateriality, which we intentionally amplify through our enabling the participant to see through and virtually float through everything around them. At the same time however, we deliberately confound these sensations by paradoxically grounding the experience in the participant's own body, i.e. in his or her own breath and centre of balance. In this way, *Osmose* and *Ephémère* seek to reaffirm the presence, often overlooked or denied in conventional VR, of the subjectively-inhabited body in immersive virtual space.

As a means of subverting the conventional VR aesthetic of hard-edged-objects-in-empty-space, we use semi-transparency and translucency in the visuals, an approach developed long before in my painting. Thus, when an "immersant" is within *Osmose* or *Ephémère* - everything he or she sees is semi-transparent. Just as in my own un-"corrected" vision, there are no sharp distinctions between solid bounded objects in foreground and background, and no empty space, but instead, ever-changing abstractions of semi-transparent forms. The effect for the immersant is of floating within a world which is neither wholly representational (i.e. recognizable) nor wholly abstract, but hovering in between. As the participant moves within the virtual space, the ever-changing spatial relationships between the various semi-transparent forms (one can see through more than 20 layers simultaneously, a major technical challenge at the time) create a constantly changing variability of the perceptual field. This generates semiotic and sensory fluctuations or what I simply call "perceptual/conceptual buzz". Based on a painterly strategy of maintaining a "razor's edge" between representation and abstraction, whereby multiple associations or interpretations are deliberately evoked (rather than a single meaning being literally illustrated), our intent was to heighten ambiguity in order to refocus the participant's attention on their own act of perceiving, or rather of being.

In *Osmose* and *Ephémère*, the immersive experience is also significantly affected by our use of sound. As one journeys throughout the spatial realms, one is immersed in constantly changing sound coming from all directions. (In *Osmose* the sounds are derived from a male and female human voice uttering phonetics, and in *Ephémère* from viola, digitally altered to create a vast range of aural effects.) The sounds have been "localized" in three-dimensions and have been designed to transform, like the visuals, on the fly, in real time, in response to the immersant's ever-shifting position, speed, direction of gaze, and various other events. In both works, the sounds have been composed to oscillate between melodic form and mimetic effect in a state somewhere between structure and chaos.

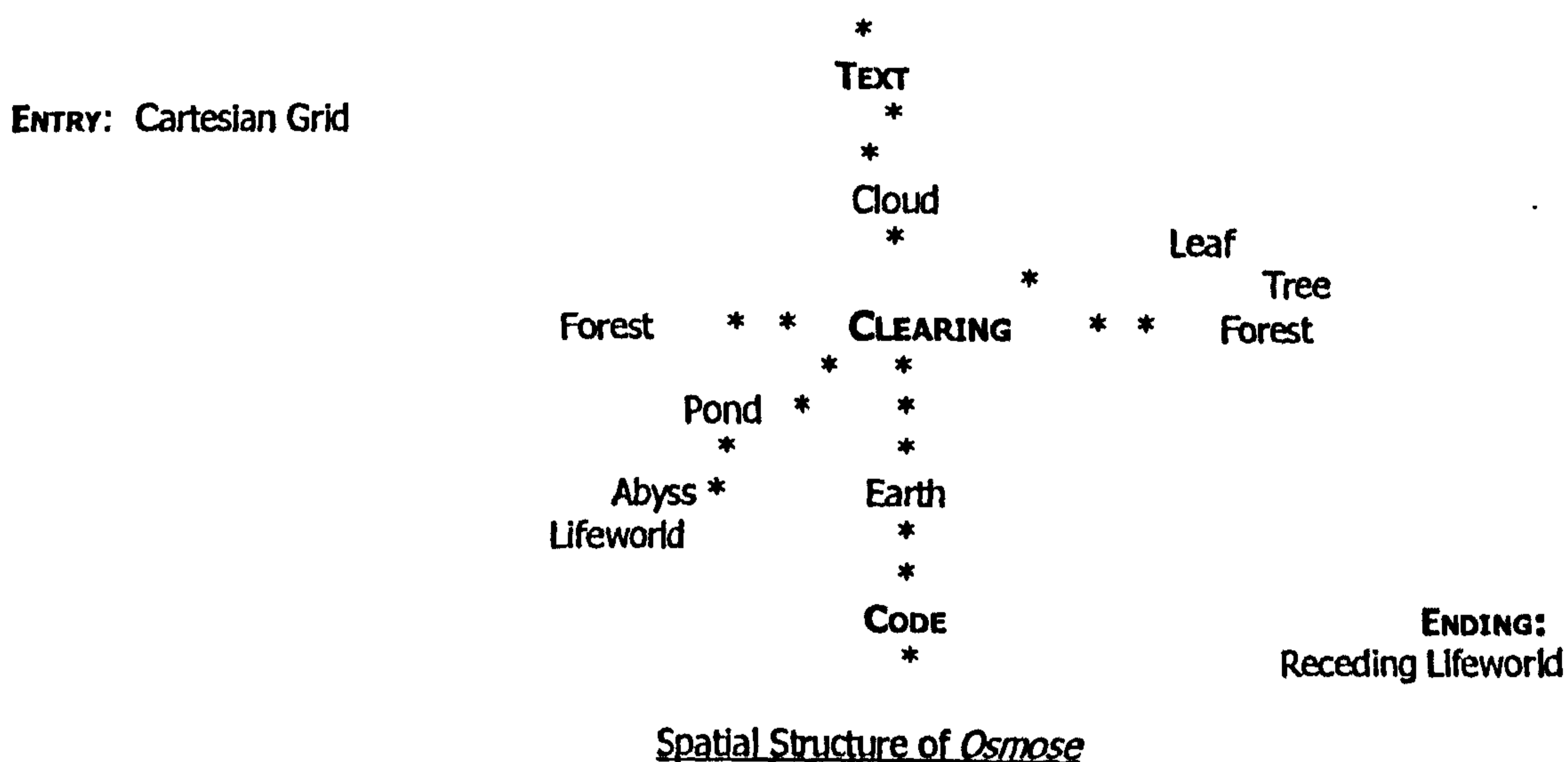
In terms of content, both *Osmose* and *Ephémère* are based on nature and landscape as metaphor. As such, their realms are populated with trees, roots, rocks, streams, etc., all iconic elements which have reoccurred in my work for 25 years. It is outside the scope of this essay to discuss the reasons for and implications of re-presenting the natural world in virtual environments. However I do want to emphasize that my intention has been to use the medium's unique qualities to present nature beyond the veil of surface appearances, while grounding such perception in the subjectively lived body. In this context, my work could be interpreted as an ongoing attempt to articulate a vision of nature perhaps closer to how Heidegger (in *Heraklit*) described the Greek's "physis" - as "outside of all specific connotations of mountains, sea or animals, the pure blooming in the power of which all that appears and thus 'is'".

Before going on to describe immersive journeys through *Osmose* and *Ephémère*, I want to emphasize that they are spaces, or rather *places*, for perceptual play. They do not contain a predetermined linear narrative. In these works, each participant's experience is unique, unrepeatable, dependent on one's own behaviour, on one's whim or will. In the following pages, I am going to describe *Osmose* and *Ephémère* as if I were leading you on a journey: but it is important to remember that I could take you on many different trajectories through these two works, because they are places, virtual landscapes, among which the participant may roam, engaged in solitary reverie.

A journey through the virtual realm of *Osmose*

Osmose: derived from 'osmose'(Fr) 'osmosis'(Eng) from 'osmos' (Grk) 'to push'; a biological process involving passage from one side of a semi-permeable cellular membrane to another. *Osmose as metaphor*: a transcendence of difference through mutual absorption; a dissolution of boundaries between inner and outer; an Inter-mingling of self and world.

Osmose consists of nearly a dozen realms, of forest, pond, subterranean earth and so on, all situated around a central clearing. The spatial structure of the work has a strong vertical axis (rather than the conventional horizontal plane of most VR works) - amplified by the use of breath to buoyantly rise or descend. Vertically, there is a kind of spatial recycling, whereby if the participant ascends to the very heights of the space she will be returned to its depths, and vice versa.



When an immersant first "enters" *Osmose*, he or she will find him/herself in the midst of a three-dimensional grid extending infinitely in empty black space. This grid (a reference to the Cartesian xyz coordinate system) functions as an orientation site for becoming familiar with the breath and balance interface. The immersant will soon realize she is buoyantly "floating" as if gravity free, rising and falling according to the rhythms of her own breath, and that she can hover in "mid-air" or glide, as well as change direction by shifting her centre of balance.

A few moments after her entry, the grid soon fades, leaving the Immersant in the middle of a clearing. Gazing all around, she sees, or perhaps first hears, what appears to be a sienna-hued oak tree, near a small pond into which is flowing a stream of light particles, and all around, a circumference of dark forest. The clearing cycles through day and night, its ebb and flow of light and dark accompanied by subtle visual and aural changes. These include, at night, flitting firefly-like lights and a nocturnal melody repeating over and over (created, like every other sound in *Osmose*, from phonetic utterances digitally altered.)

The immersant will realize she has entered a non-Cartesian place, very unlike the "real world": here, everything is dematerialized and semi-transparent – there are no solid surfaces, no hard-edges, no separate objects in empty space. Instead, the Immersant can see through everything – through the body of the tree, the ground, the roots below.

She may choose to drift into the clearing's tree, rising with its streaming particles. Or she can float into its branches, only to find herself passing through a previously invisible leafy canopy and into the interior of a leaf, consisting of brightly blazing lights streaming through green space, accompanied by high-pitched sound. From within the clearing, if the immersant breathes shallowly and leans forward, she can also glide towards the encircling forest. As she nears its edge, the clearing will fade and the forest realm will begin to appear all around her. For several moments, she may find herself in a non-Cartesian spatial intermingling of clearing and forest, in which she is paradoxically enveloped by both realms at once (with skill, it is possible to remain within this strange liminal zone, although moving forward or back will summon in one realm and cause the other to fade).

Once within the forest, the immersant is surrounded by a thick mass of large semi-transparent leaves (created by digitally scanning real leaves – the only use of the "real" in the entire work, all else is digitally constructed). As she floats, these leaves constantly re-form themselves around her, creating an endlessly recurring space. In the *Osmose* forest, heading in a straight line will only cause it to recur forever (and moving too quickly will summon in the Cartesian grid). It is possible to exit the forest by following a stream of flowing luminous particles back to the clearing's pond, or alternatively, by remaining still and hovering in one place: this causes the forest to fade and the clearing to reappear.

From the clearing, the immersant can also approach the pond (perhaps guided to its location by its emitting of frog-like sounds) and hover above its transparent surface. If sufficiently deft in use of breath and balance, she can descend through its lowest depths into an oceanic abyss. This seemingly vast space is populated only by dimly visible streaming fishlike entities far below, as well as echoing calls all around. Eventually the immersant will hear a distinctive tinkling sound behind her. To leave the abyss, she must head towards that sound into the reference-less big blue. In response, a translucent pod-like entity, the "lifeworld", will appear. As she moves towards it, it also tumbles towards her until she is engulfed within it: she may realize that the lifeworld was the clearing seen from without as a miniaturized globe, and that now she is back inside it, hovering above the clearing's tree.

The immersant can also look down directly into the subterranean earth, because the ground too is semi-transparent. If she exhales deeply, she can descend vertically into this realm, aurally resonant and populated by the ghostly forms of semi-transparent, semi-abstracted roots and boulders and luminous particle streams. The immersant can glide through this realm, floating among and through its various elements, and she can depart simply by taking a breath to ascend back to the clearing.

If the immersant so desires, she can descend even deeper to another realm below the earth, of software code. Represented here are thousands of lines of phosphorescent green text in black space, the actual code John Harrison programmed to construct the work. It is possible to float among these scrolling walls of code, including the constantly changing measurements of the immersant's own breathing. The code realm was intended to function as the conceptual substrate of *Osmose*, drawing attention to the computer-generated artificiality of the experience.

The immersant can also ascend from the clearing through a thick ceiling of whistling cloud into a realm of pale fog within which float scrolling passages of written text. These are excerpts of writing on perception, space, nature, the body, and technology by poets and philosophers such as Rainer Maria Rilke, Gaston Bachelard, and Merleau-Ponty, whose ideas have accompanied and encouraged me in the past decade. It is possible to float in the gray fog among these scrolling texts and listen to their accompanying aural effects, which sound

somewhat like choral voices even though, like all the sounds in *Osmose*, they are derived from a single male and female voice uttering phonetics. The text realm functions as the conceptual superstrate of *Osmose*, and together with the code, its twin in the underworld, provides a conceptual framework around the entire work.

After a certain amount of time has elapsed (we limit the immersive session to 15 minutes, even though one could stay in *Osmose* indefinitely) the journey is gently brought to a close. The ending is signaled by a reoccurrence of the clearing's nocturnal melody, and a gentle reappearing of the lifeworld. Immediately however, the lifeworld begins to recede, irretrievably, until it has shrunk to a tiny spec and then disappears altogether, leaving the immersant floating alone in empty dark space.

A journey through the virtual realm of *Ephémère*

In comparison to *Osmose* – which I think of somewhat as a perceptually mesmerizing stage set (whereby motion is primarily derived from the Immersant's buoyant passage and resultant ever-changing spatial relationships throughout) – I think of *Ephémère* more like a virtual "opera". For *Ephémère* is a temporal space, whereby every element, every form, has been choreographed (within a range of randomness) to engage in constant transformation, in an unceasing ebb and flow, wax and wane of visibility and audibility. As the name *Ephémère* suggests, this work was intended as an evocation of ephemerality: of the fleeting quality of our own lifespans as mortal beings, embodied among an unfathomable myriad of other beings, all engaged in coming-into-being, lingering and passing-away in the flow of life through spacetime.

ENTRY:	<u>WINTER SWAMP (PROLOGUE)</u>		<u>SPRING</u>	>	<u>SUMMER</u>	>	<u>AUTUMN</u>	>	ENDING
	*								
FOREST LANDSCAPE:	River,	Boulders,	Foliage leafing	>	Falling trees & leaves	>	embers & ash		
	*								
SUBTERRANEAN EARTH:	Stream,	Boulders,	Seeds germinating	>	Decay	>	embers & ash		
	*								
INTERIOR BODY :	Arteries,	Organs,	Eggs falling	>	Bones (aging)	>	embers		
	*								

Spatial & Temporal Structure of *Ephémère*

Ephémère is structured spatially on a vertical axis, with three horizontal levels: forest landscape, subterranean earth, and Interior body. Accordingly, the work's iconographic repertoire has been expanded beyond *Osmose*'s trees, boulders, pond and stream to include flesh, bloodstreams and bone. However, even as the Immersant roams among all three realms in *Ephémère*, no realm remains the same. The forest landscape changes continually, passing through cycles of day and night, and transforming through the seasons. Deep within the earth, huge boulders transform into pulsing body organs, and within the body, eggs appear, while aging organs give way to bone. Throughout the duration of the experience, the various elements of rocks, roots, seeds etc., come into being, linger and pass away: the timing of their appearances and disappearings is dependent not only on the temporal progression of the work, but on the Immersant's vertical position, proximity, slowness of movement, and steadiness/duration of gaze. (For example, when gazed upon, boulders

summon phantom landscapes, and seeds germinate, inviting entry into the luminous interior of their blooming.)

Here too, there is a stream or river, but unlike the stream in *Osmose*, the one in *Ephémère* has a gravitational pull and provides an alternative means of navigating within the space. If the immersant floats too near, the river will suck her into its force and carry her along. It is actually possible to experience much of *Ephémère* by passively submerging oneself in the swiftly flowing and noisy stream/underground river/artery: for if the immersant remains within it for a sufficient amount of time, it will respond by randomly transforming the surrounding spatial realm into one of the other realms of *Ephémère*.

When a participant first enters *Ephémère* (wearing the same gear as worn in *Osmose*), she will find herself floating among star-like points of light in dark space. As she becomes accustomed to breathing in to rise and out to fall, the particles of light begin to fall like snow, and the darkness gives way to fog, filled with aural effects of wind and rattling wood. Far below are dark slender forms of trees. Upon exhaling, the immersant may drift down among them, their branchless shapes suggesting they are but relics, no longer living. There are also semi-transparent boulders. By now she will have heard, and then perhaps turned to see, a darker horizontal ribbon with bright particles flowing within it, intended to suggest a winter stream. The immersant, still enveloped in ebbing gray light and falling snow, is in the winter swamp, the "prologue" of *Ephémère*.

In the winter swamp, everything is more abstract than in the *Osmose* clearing, as well as being in black and white rather than in colour. Here (unlike *Osmose's* spatially-anchoring tree to which immersants can return for reassurance and to regain their bearings) no place remains the same: every element is engaged in a constant process of coming into being, lingering, and passing away, both visibly and aurally. It is almost as if the immersant has floated down into a ghostly realm engaged in its own processes of becoming and un-becoming. If the immersant chooses to float towards a tree and passes through its slender trunk, in response she will hear a cry like distant ripping wood as an almost transparent white tree (the *Osmose* tree making a cameo) slowly falls and crashes. If she passes through other trees, this ghost tree will fall again, and again.

If the Immersant slowly approaches one of the boulders (which like the trees are engaged in their own appearances and disappearings) and steadily gazes at it from a tactful distance, in response the boulder will summon in a phantom landscape. This landscape, with its encircling horizon of Arctic-like bergs of ice and snow, and its accompanying sounds, will briefly appear all around her, then fade, leaving her in the swamp. Meanwhile, the ambient light is changing as dusk ebbs into night. The entire swamp has been "choreographed" as a prologue lasting several minutes, and the immersant is unable to move elsewhere until night eases into dawn.

After a certain amount of time has elapsed, the swamp transforms itself into the forest landscape realm, composed not only of trees and boulders and a river, but of abstract intermingling layers of various greens and vertical flows of luminous particles, all engaged in various rates of appearing and disappearing. As in the winter swamp, the forest's boulders are also "sensitive" to the immersant's behavior, and, if approached in a certain way, will summon in another phantom landscape which fades almost as soon as it appears. The forest itself is transforming constantly, irrepressibly engaged in a seasonal progression from the snowy pale of winter through spring and summer to the climatic decay of autumn. The Immersant can choose to spend her entire journey on the forest, but if she leaves it perhaps to return later, it will continue to progress over time.

As in *Osmose*, if the immersant exhales deeply, she will descend vertically through the semi-transparent ground, past the spreading roots of trees into a vast subterranean earth. Here she can hear deep rumbling sounds of shifting rock, as seemingly gigantic boulders drift, and slowly appear and disappear. The comings and goings of these rocks have all been choreographed, some in groups, some individually, at different depths. They are richly hued in ochres and siennas, and like everything else are semi-transparent, enabling the immersant to see through them and float through them as well. As the immersant looks around, she may see the river again but manifested here as a swiftly flowing underground stream, a luminous green ribbon suspended in space, issuing its own distinctive sounds. If she approaches, its gravitational pull will seize her as did the forest river, and carry her along, while summoning in either the forest or the body realm below. Perhaps she will surrender to the underground stream (for it takes bodily effort to move away from its pull) and find herself back in the forest landscape, its various abstractions now engaged in the lushness of summer green or the ochres and siennas of autumn.

The immersant may, however, choose to remain longer in the under-earth, seeking the inter-responsive "seeds". Suspended among the subterranean rocks, at a certain depth, and appearing only at certain times within the temporal progression of the work, are pod-like seeds (which like all other elements in *Ephémère*, are engaged in visibly and audibly coming into being, lingering and passing away).

If the immersant gazes at a seed from a certain distance, it will begin to flicker in acknowledgment that it has "sensed" her presence, and will consequently begin to germinate. If the immersant is able to approach before it completes this process and withdraws, she can enter inside and experience its luminous blooming while enveloped within its translucent veils. After the seed reaches its climax, it will fade and she will find herself alone again in the subterranean realm. Some immersants never notice the seeds, some do not gaze long enough to initiate their germination, while others effortlessly enter their blooming.

Below the subterranean earth is yet another realm, the interior body, intended to suggest the internal pulsing frothing rhythms, aural and visual, of a subjectively-inhabited body engaged in the processes of living (referring not only to the immersant's own body, but to all living flesh bodies). This realm has been placed at the "bottom" of *Ephémère* to function metaphorically as the substrate or foundation, under the fecund earth and the lush bloomings and witherings of the land. Recalling the words of Joseph Campbell in *The Inner Reaches of Outer Space: Metaphor as Myth and Religion* (1986): "Myths and dreams... are motivated from a single source – namely the human imagination moved by the conflicting urgencies of the organs..."

As in the other realms of *Ephémère*, here all organ, artery and vein-like elements are semi-transparent and semi-abstract, and are engaged in carefully choreographed yet random appearances and disappearings. If the immersant floats to a certain depth within the body realm, she may be surrounded by a slow raining of blazing white egg-like forms, which eventually drift by and fade away. In this realm too, there is the river, but manifested here as a bloodstream or artery from which issues forth the sounds of calling voices. Sampled from recorded animal cries - the only non viola-derived sounds in the work - these are intended to subliminally reaffirm embodied presence.

From within the body, the immersant can descend even lower, passing through a transitional realm of thorn-like forms whose color shifts from blood red to green as she is

returned to the upper foliage of the forest landscape. Similarly, if the immersant rises steadily in the forest, she will pass through the thorns until she is again in the body. In this way, it is possible to cycle endlessly vertically through *Ephémère*: if the immersant attempts to seek its horizontal limits her quest will reveal that each realm is endless as its elements constantly reconfigure themselves around her.

There are several "endings" in *Ephémère*, all dependent on where the immersant is during the last phase of her journey. If within the forest landscape a dozen minutes into the work, she will be enveloped by brightly-hued orange space with dark tree ghosts screaming distantly and falling all around (again, the *Osmose* tree). If she chooses to remain within this autumnal burning, eventually all that will remain are single ochre leaves falling in dark space. If she is within the under-earth at this late phase, she will experience a distinctive shift in its sounds as its various elements begin disappearing one by one, until there are only embers falling. And if she is within the body realm, she will experience the flesh around her slowly giving way to luminous filaments of bone which in turn will also fade out, leaving only embers and ash drifting through space, ending the journey in dissolution.

The immersive experience

The immersive experience of *Osmose* and *Ephémère* is designed to be intimate and solitary. During public exhibitions however, the experience takes on a performative aspect. In this context, the immersion chamber is located adjacent to a large dark space where visitors 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 he/she 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.

Since 1995, more than 20,000 people have been individually immersed in *Osmose* and *Ephémère*. We have had an opportunity to observe many of them and have noticed certain patterns of behavior. After becoming accustomed to using the interface of breath and balance, most participants are first intent on "doing", i.e. travelling around at high speed to see as much as possible, in what appears to be an extension of everyday goal-oriented, action-based behaviour. However, half way into the fifteen minute experience, most people undergo a change: their facial expressions and bodily gestures loosen, and instead of rushing, they begin to slow down, as if perceptually mesmerized. In this final phase, attention seems to be increasingly directed towards the unusual sensations of floating and seeing through things, in what becomes a kind of slow-motion perceptual free-fall.

Based on participant responses gathered through written comments, correspondence and video interviews, it appears that many people experience a heightened awareness of self-presence - paradoxically consisting of both a sense of freedom from their physical bodies and a heightened awareness of being in their bodies at the same time. Often, people experience intense feelings of euphoria and/or loss when the session is ending, causing some participants to cry afterwards and others to even exclaim they are no longer afraid of dying. What is going on here? As I have suggested in earlier essays (see Further Reading), a partial answer may lie in the words of the French philosopher Gaston Bachelard:

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

Bachelard was actually referring to the perceptually and psychologically transformative potential of places like the desert, the plains and the deep sea - immense open spaces which are perceptually invigorating because they are *unlike* the environments to which most of us are accustomed. Bachelard's insight has been echoed by psychologists researching the effects of traditional methods of achieving altered mental states. In such practices as meditation (which involves deep breathing as do *Osmose* and *Ephémère*), as well as chanting, dance, and the ingestion of psychotropic plants, the intent is to foster psychological conditions which lead to an "undoing" of habitual perceptions in favour of alternative sensibilities. While these may be less efficient in terms of biological survival, psychologists believe that they permit experience of aspects of reality previously ignored. According to Arthur Deikman in "*Deautomatization and the Mystic Experience*" (1990), the conditions fostered by such practices involve a de-habituating or "de-automatizing" of perceptual sensibilities, which leads to perceptual expansion.

Conclusion

If the responses of those who have experienced the environments *Osmose* and *Ephémère* are anything to go by, then it appears that immersion in virtual space can be "psychically innovating". That this may be so, is, I believe, due to the paradoxical nature of the medium. Here, ephemeral virtuality can coexist with an apparent "real" three-dimensionality of form, and feelings of disembodiment can coexist with those of embodiment (given the use of an embodying interface). These experiential paradoxes, when combined with the ability to kinesthetically interact with elements within the space, can create a very unusual perceptual context, providing a unique means of "changing space".

I want to emphasize, however, that the medium's perceptually refreshing potential is possible *only* to the extent that the virtual environment is designed to be *unlike* those of our everyday experience. When designed in ways that merely reflect our habitual perceptions and culturally-biased assumptions, such environments forego their transformative potential and serve to reinforce King Logos and the status quo. It is only when such environments are constructed in ways that circumvent or subvert the medium's conventions, that immersive virtual space can be used to convey alternative sensibilities and world-views, potentially functioning as a perceptually and conceptually invigorating philosophical tool.

At the present time, I am beginning a new work in immersive virtual space, and consider *Osmose* and *Ephémère* as only early steps in what I hope to accomplish with this medium. Ultimately, what I am seeking are even more effective ways to use this technology to provide an experience for others whereby it is possible, however momentarily, to slip through Aldous Huxley's "doors of perception" and glimpse reality, as I have intuitively sensed it, and so deeply long to know it, beyond the Cartesian divide.

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Carol Gigliotti interviews Char Davies

Char Davies has achieved international recognition for her work in virtual reality. Integrating real-time 3-D computer graphics, 3-D localised sound and user interaction based on breath and balance, the immersive environments Osmose (1995) and Ephémère (1998) have been exhibited at the Museum of Contemporary Art, Montreal, Canada, the National Gallery of Canada, Ottawa and the San Francisco Museum of Modern Art, US and the Barbican Gallery, London. Davies' virtual environments may be seen as part of a feminist aesthetics powerfully influencing aesthetics as a whole. These environments may also be seen as pioneering examples of an emergent interactive aesthetic of bodily and nature-centred constructions.

This interview took place in November 2001 in West Vancouver, British Columbia, Canada.

Carol Gigliotti: Char, you and I discussed in an interview in 1994, the idea that your being female is one aspect that has influenced your work on virtual environments. Could you develop this here?

Char Davies: First, let me talk about space. For a long time, I have been interested in conveying a sense of being enveloped in an all-encompassing, all-surrounding space, a subjective embodied experience that is very different from the Cartesian notion of absolute, empty, abstract, xyz space. As an artist, I am interested in recreating a sense of lived, felt space that encircles one with an enveloping horizon and presses closely upon the skin, a sensuous space, subjectively, bodily perceived. Some might interpret this as a uterine or womb-like space. Perhaps the desire to recreate, to communicate this sensibility, my sensibility, of such space is because I am female: I would leave that up to interpreters of my work. I think it might have more to do with having spent so much time alone in nature. This desire, that is the desire to convey a sense of spatial envelopment, is what led me to abandon painting in the mid-1980s and become involved with 3-D computer technology - because I imagined it might free me from the limitations of the 2-D picture plane, and allow me to effectively work in an enveloping three-dimensional space. Once I was making images with 3-D software, I wanted to bring my audience with me into that space, and so I turned to the medium of immersive virtual space - or what many people call virtual reality. For me the all-enveloping, *immersive* aspect of Virtual Reality (VR), which I believe is only possible with a head-mounted display at this point, is key. I'm not interested in the technology per se, but in the kind of spatial perceptual experience it gives access to.

Carol Gigliotti: You developed a different kind of user interface from what has been commonly used in virtual environments to navigate the virtual spaces in your work; could you say something about the elements you used?

Char Davies: The user interface we developed is based on tracking the participant's breathing and balance. Breath and balance provide the means by which people can navigate through the spatial realms of the work - they breathe in to rise, out to fall. . . This interface was intended to pose an alternative to conventional approaches to VR, whereby the interface usually involves the hands, in particular the joystick, which is so obviously phallic it makes me laugh. . . There may be exceptions of course, but in general, hand-held interface devices reinforce a dominating stance to the world in terms of '**I'm doing this to that**'. And this not only reflects, but reinforces the conventional sensibility of our culture, which is still primarily patriarchal. What concerns me is that many designers or artists working with VR do not seem to be aware of, or even care, that by using conventional approaches or design metaphors, they are reinforcing the *status quo* - regardless of what content they may develop. If a

joystick is involved, the work is merely repeating our habitual approach to controlling, or rather, mastering the world around us.

Another characteristic of my work is the semi-transparency of the visuals, whereby everything is soft and luminous. By enabling people to see through things, and float through them as well, I've tried to evoke a perceptual ambiguity of figure and ground - dissolving the culturally learned, habitually perceived boundaries between subject and object, inside and out. This has been an essential aspect of my work for along time, beginning with painting. It's another strategy for subverting the dominant visual aesthetic in VR and 3-D computer graphics which strives for ever greater photo realism or what I call hard-edged-objects-in-empty-space, reinforcing the Cartesian divide between dominating subject and passive object. I feel a great need to subvert these conventions. . . because my experience of the world is other than this.

Because I am attempting to subvert or at least circumvent conventions in the medium, I think of my work as political, though in a very subtle way. Years ago I was more didactic in my views and in my art: but a result of having been a Marxist in the late 1970s - organizing female bank workers before I'd even ever had a job, visiting China as a guest of the government and so on - I have little tolerance for didacticism. So I guess I believe in subtlety, in altering people's perceptions, or rather allowing them to be refreshed, intensified, in a very subtle way.

Carol Gigliotti: You and I have done several public panels together, most recently at the *Planetworks: Conference on Ecology and Information Technology* (12- 14 May 2000, San Francisco, US) and the *Body, Mind, Technology* panel (January 2001 at Simon Fraser University, Vancouver, BC, Canada). In these public talks, spirituality in art making has been discussed as an important - actually essential - topic for some artists and thinkers specifically working in the digital field. Do you see a link between spirituality and your work or the uses of computer technologies in art making?

Char Davies: While I do not describe my work in spiritual terms, some of the people who have experienced it do. According to anecdotal reports - a controlled scientific study on this is in the works - numerous participants have had profound experiences within *Osmose* and *Ephémère*. Believe it or not, the head curator at one museum declared afterwards that she was not afraid of dying, that being in *Osmose* had taken away her fear of death. Other people have told me that afterwards they had sat down and wept. Most of those who told me this were men, interestingly enough, from some sense of nostalgia and loss that they could not articulate. Another participant wrote to me that she had for the first time experienced her body as the site of her own consciousness occupying space. I wrote a paper about people's responses, comparing them to psychological studies on altered states. This paper is on my website.

I am, however, reluctant to identify the work as overtly spiritual. It's about perception. It's very experiential work, by that I mean that each person's own subjective experience in the work, their own journey, is the work, and everyone has a different journey and perhaps a different interpretation. Now maybe that is shying away from controversy, I don't know. I am not a techno-romantic. I do not believe in the techno-utopian view of VR, of cyberspace. The technology associated with this medium is not neutral. It has come out of the military/scientific/Western/industrial/patriarchal paradigm. And so by default, the

technology not only reflects but *reinforces* dominant values, unless deliberately subverted by the artist. I do not welcome a technologically-engulfing, disembodied, cyborgian future. I don't believe, as some in the field do, that nature is an outmoded metaphor and that the sooner we can recreate ourselves through silicon and genetic engineering, the better off we'll be - and when we have fused our brains with our machines we can leave this spoiled planet for virgin territory elsewhere. This is a testosterone dream. . . I want no part of it, and I guess that's where my female sensibility comes in. In my work, I'm attempting to *reaffirm* the role of the subjectively-lived body. Rather than deny our embodied mortality and our material embeddedness in nature, I seek, somewhat paradoxically through a highly technologicalized art form, to return people to their bodies and to the earth by using VR to *refresh* their own perceptions of an embodied being-in-the-world, to return them to a perceptual wonder at being here.

Carol Gigliotti: Could you say something about what has contributed to developing these ideas?

Char Davies: I have been working as an artist for more than 25 years, in the first half of my career as a painter, but also as a filmmaker etc. all the while exploring the capacity of different media to serve my particular artistic quest. My work is my path and it's a solitary, sometimes lonely, path. My work is my attempt to understand more deeply the very fabric, the very extraordinariness of our being here, being alive, embodied, sentient. The very "*such-ness*" or "*is-ness*" of life. We are ephemeral, passing through like everything else. My work is my pathway to seeking some kind of understanding. I am compelled to do this, even though I know I will never find an answer. . . though maybe in that last instant during death you understand everything. . .

When I was in university, I studied Buddhism with a professor who had spent ten years in a Japanese monastery. I remember him urging us to see beyond the veil of appearances. He would tell us that the world as we saw it was not real, it was an illusion, it was *Maya*. Having grown up in the country with a great love of rolling fields and forests, of the beauty of the physically manifested earth, I remember feeling much existential distress. Somehow I think what he taught us permeated within me very deeply because. . . when I speak of this pathway towards understanding something and of wanting to overcome some deep sense of estrangement, it's out of the desire to apprehend some kind of flow or flux that is "*behind*" the world of appearances. I call it the life-flow. I certainly would never call it God and I don't see it in Christian terms or in terms of any of the traditional religious systems I know. It is that life-flow, an awareness of being immersed in that extraordinary life-flow, that I wish to communicate to others.

Centuries ago I probably would have gone off and lived in a hut on a mountainside contemplating the eternal and never come back. Well, actually I do spend a lot of my time now in a cabin on a mountainside, but what brings me out of that metaphoric hut is the need to communicate. This need to communicate is both the artist's blessing and the artist's curse. I guess what I'm trying to say is that my need to apprehend the so-called suchness of the world and to communicate my interpretation of it to others is just. . . what I do. It's how I am spending my life. While the technology associated with immersive virtual reality enables me to explore and convey this in ways I find intriguing and paradoxical. If all I had was a pencil, or even a stick and some mud, I would try to express the same thing, to follow the same quest. I can't not do this.

Carol Gigliotti: Do you feel your thought and work to be somewhat outside the present mainstream of interactive technologies, and if you do, in what ways?

Char Davies: Conceptually my work may lie outside the mainstream because of the way its content and visual sensibility has evolved through my painting from many years ago. As an artist, I have always directed my attention to light and space and nature. While years ago I was a realist painter, I gradually became more interested in a developing a more subjective, abstract way of interpreting the world, i.e. not so much what the world looks like in terms of its surface appearances, but rather what lies behind, beyond, or within, and how to approach and represent its myriad of fluxes and flows. Even though I know I will never achieve this because it is probably unknowable, let alone representable, it's OK. I think it is the pathway of approaching, the seeking, that is as close as we get, unless perhaps we are mystics, in the true sense of the word.

To give an example, the softness and semi-transparency in the VR environments, and the 3-D digital still images before them, and the paintings before them, were influenced by my own extreme myopic vision which I began to work with artistically in 1981. I am talking conceptually here, for obviously, technologically we are building on previous developments in the field of VR and 3-D, and on the team's various experiences in the 3-D animation software and VR development fields.

This is why my work is not about technology. A lot of people working in the field today are interested in exploring various aspects of the technology, what it means, where it's going, and many are doing important work. There is also a certain amount of making what some of us call '**toys for boys**' . . . I am, like always, marching to my own drummer, accompanied of course by the talented and gentle souls who have worked with me, both men by the way, John Harrison and Georges Mauro. The three-dimensional sound in *Osmose* and *Ephémère* was laid out by a woman, Dorota Blaszcak, who worked with the composer Rick Bidlack.

Carol Gigliotti: Your early childhood and adolescence was spent in rural Ontario; did you develop a strong relationship to the Canadian landscape or nature during that time?

Char Davies: I was fortunate to spend part of my growing up in the summers in semi-wilderness by a lake in northern Ontario where one could hear loons and wolves at night. We didn't have electricity or running water and there were no roads. Nature there was a huge presence. As a child facing a midnight trip to the outhouse to pee, the darkness of the night was almost mythical in its awesomeness. I think perhaps this sense of nature, as an unfathomable myriad of Otherness, is still with me today, and is the lure that calls me. . . and will continue to call me until my ashes lie in its earth.

When I was 16 or 17, I used to ride a lot, on horseback, alone. As a young woman I felt much safer on the back of a horse, and would ride on back country roads and lanes in relatively remote places where I would certainly never have walked. I'd ride through all kinds of weather with the seasons changing, the light fluctuating. . . always enveloped by a horizon, which I think perhaps played a role in my subsequent desire to work in enveloping virtual space and represent the flowing transformations of the natural world, and perhaps, even to make work meant for a solitary participant who is passing through. That actually interests me more than interactivity. I mean, do boulders shiver when we pass by? I know wild animals will become silent and still unless you pass by really really slowly, with respect for their space which is something I am working towards. Just as an aside, though, I should say that so far I've never attempted to re-present the living creatures there, only their environmental context, because so far I have felt incapable, not up to the task of doing them justice. I wouldn't want to merely objectify them but would have to find a way to allow them to remain subjects too. So, much remains to be done in future work.

I should also confess that my intense desire to re-create an experience whereby boundaries between inside and out dissolve, whereby self and world are one, may have originated in what I suppose could be called an epiphany that I had when I was about 17. Alone, at dusk, in a field in the countryside, I had an experience whereby suddenly the circumference of my mind expanded to merge with the enveloping horizon. It was the most extraordinary thing that has ever happened to me, lasting only an instant. On a very deep level, my work is no doubt a reflection of my longing to experience that again. When I was in my late teens, we were expropriated from our place in the countryside for a housing development. I actually left Ontario after I turned twenty and never returned because of this.

Carol Gigliotti: You now live and work on a farm in Quebec. Could you say how this landscape or environment has influenced the imagery or ideas in *Osmose* and *Ephémère*?

Char Davies: My work has been completely, totally, influenced by my experiences of being in nature, i.e. the non-man-made world which is our physiological and psychological ground. In the past seven years this influence has become even more specific, since I was able to buy 400 acres of rural, semi-wild land in southern Quebec near the Vermont border. I have named this land *Reverie*, because my creativity, my ideas for new work, always seem to flow most fertilely from a state of reverie, i.e. when the imagination can wander unbound by rational thinking. And I do that very well there. Gaston Bachelard wrote a wonderful book called *The Poetics of Reverie*, along with his classic *Poetics of Space*, which has kept me company for many years.

Production of the virtual environment *Osmose* actually began in 1994, the summer I acquired this land, even though I had been writing about the work for eight months previously. The central spatial realm of *Osmose* is a clearing with a pond and an old tree, surrounded by forest through which flows a stream. Actually, in a strange twist, just last week we planted an oak tree by one of the ponds - in eighty years it will look like the virtual *Osmose* tree, it will *be* that tree. . . That's what I am starting to do now on the land. . . confuse the virtual and the real. . . *Ephémère*, however, which we began working on sometime in 1996, even though it's more abstract than *Osmose* is a more direct manifestation of the land. For example the white winter swamp which forms its prologue is, I think, the beaver swamp my former partner drained. I've always regretted his act and now it has reappeared in ghostly form in virtual space. . . *Osmose* was designed more or less as if it were a stage set, even though all the elements were semi-transparent and there were some particle flows: In *Ephémère* we attempted to re-present nature as an operatic flux, with everything flowing, with many different elements coming into being, lingering and passing away. I do feel that *Ephémère* is very much this land, flowed through me and re-manifested in virtual space. It's a strange feeling.

I spend a lot of time on the farm alone and an even stranger thing is happening: the virtual and the real are starting to slip/ slide together. Because at times, on the land, which is on the southern slope of a mountain and has high ridges sloping down like arms on either side - almost as if one is being embraced - looking southward to a panorama of Vermont's Green Mountains, an experience of space which, by the way, seems to create an optical illusion whereby the horizon really does seem to envelop, and the sky seems like a giant bowl - an effect which I would think James Turrell working on his crater in the American Southwest might find intriguing. On this land I actually feel as if I am in a virtual environment. It's hard for me to put this into words. *Ephémère*, in particular, is very much this land, not a literal representation, not its surface appearance, but a virtual manifestation of the elements of the land, i.e. its flowing springs and creeks, its ponds, its trees and roots and rocks, its crumpling leaves in the fall, its waiting seeds in the earth, its nesting birds, its beaver, bear and deer ,

all as numinous presences: the flows and forces of the land coming through me- the artist as conduit, as translator.

Carol: Could you say something more about this slippage between the virtual and the real ?

Char Davies: In the past, it has been suggested by a (male) colleague reviewing my work that I should abandon the "*edenic fallacy*" and refocus my attention on the technology itself. This is a complete misreading of what I'm trying to do. I'm not trying to return to some idyllic fantasy of nature. On the contrary, this land that has so intensely absorbed my attention is not pristine by any means. At the turn of the century there was a copper mine, and over the past two or three hundred years, since it was cleared by people of European origin (prior to that it was a summer hunting ground for indigenous peoples), this land has been logged and re-logged, grazed by cattle, and 75 years ago planted with apple trees and annually sprayed with chemicals. Basically, people have always taken from it as a '**standing reserve**', to use Heidegger's phrase. I'm actually actively trying to restore this land, and by that I mean learning to restore its biodiversity and trying to make it as rich as possible for supporting life. That's becoming a lifelong project for me, one that is equally important to my making art works. I'm in the midst of an amazing learning process. It's as if this land is a book and I know in my entire lifetime I will never even get past reading the preface. This land *Reverie*, with its fields and wild meadows, its forest and ponds, has become my *antidote* to working with high-technology. It has also become a grounding experience for me, in that I have to make decisions whereby my ideals are met with practicalities.

Last year I was working on clearing out a creek bed that had silted in because of a spring flood the year before. I didn't want to leave it this way and was making an aesthetic decision to restore it to its former state. I was therefore directing a small team to clear out the sand and gravel and move some large rocks (because of repetitive strain injury from too much keyboard use, I cannot do the heavy work myself). I realised there was a growing confusion in my mind, because it felt as if I was directing my team during the making of *Osmose* and *Ephémère* - that is to say, it was just like when we were constructing 3-D virtual rocks and boulders, and moving them just ever so much, to make more beautiful spatial compositions. What's the difference conceptually, moving virtual boulders in *Ephémère* or moving real boulders? Just as with *Ephémère*, I was dealing with the flow of time in space, because we knew that in the spring, a lot of water would be pushing through there, and it would probably dramatically change our work.

To be truly honest, I think my satisfaction was even greater working with the real stream bed, because I was and am in constant negotiation with the forces of nature which of course will always have the last say. It keeps one humble. One activity was in virtual space, the other in physical space, but the interesting thing was, in both cases because I wasn't doing the lifting of the real boulders I, as the directing artist, wasn't dealing with the weight, solidity, gravity. And through this process, in my mind, the real boulders became symbolic elements, almost archetypal, as in *Osmose* and *Ephémère*. So in a way, even on the land, I am and I'm not - it's very paradoxical - dealing with materiality. It's as if I were working in a virtual space, constructing a virtual environment, even when we are working with earth and rock.

Carol Gigliotti: I'm interested in your thoughts on the relationship between nature and creativity. What role does our Western understanding of human beings' relationship with nature play in our ideas about creativity?

Char Davies: This land is my muse. Sometimes I feel I'm in love. Can one be in love with land? It is very important to me that this land remains Other, unfathomable, that I do not cultivate or "tame" it all. It is important to me that there areas left wild with birch and alder and brambles, places that the local farmers would certainly clear. I want to leave places for the deer to go, where the deer can hide and coyotes hunt.

I'm in constant conversation with nature here, in ongoing negotiation with the beavers who, if left to their own devices, would clearcut all the way down the creek, making new habitat by making wetlands - which are actually my favourite landscape - but still don't exactly want them to clearcut my whole property. In the winter the deer are eating the apple buds, so we're slowly cutting down the apple trees. This land used to be a commercial orchard with thousands of trees, but I would have had to build an eight-foot fence around the entire property to keep out the deer, and I decided I'd rather live with the deer and moose than inside a cage with someone else's cash-crop and pesticides. My non-violent way of dealing with the beavers is to put chicken wire around the trees. My way of dealing with the deer is to go out of the commercial apple business - it was failing anyway - and let the deer eat the apple buds. A 20-year-old oak forest was destroyed last month by a freak 12-hour snowstorm and, as we were cleaning up the damage, I realised that the trees that had not been broken by the snow had been killed by mice, and if not mice, by porcupines. So we are leaving the trees that the porcupines find tasty and putting up fine wire around the tree trunks to protect them from mice. Constant negotiation, endlessly engaging...

The land's Otherness is very important to me, which is why I don't want to make it all over in my own image. I don't want to cultivate all of it. I want to deliberately leave places overgrown, where we don't go in and plough so that the coyotes and deer and bear and owls, the prey birds and even the giant pileated woodpeckers can feel safe. When I go to those places, I want to feel that I am in their space. This idea of Otherness in nature is very important to me. I want to approach it with tact.

Carol Gigliotti: How do you conceive of these processes in relation to time, to your own ageing and the question of mortality?

Char Davies: Ageing... I'm 47. I'm very aware of my mortality, but it's not because of my age. Ten years ago I went through breast cancer. I actually mean "went through" because it was sort of like going through a searing wall of fire. A rather intense apprenticeship with death. A few years before that I lost my younger brother Michael, turning 30, in a car accident through someone else's reckless driving, and that certainly taught me that we can disappear at any time. I think as a result of Mike's death, as well as surviving breast cancer, I'm probably more aware than most people that we're not here for very long. And this sensibility has very much permeated my work.

My favourite poet is Rainer Maria Rilke, and in one of his *Duino Elegies* he wrote about how hard it must be to be dead, to abandon the familiar things that we knew in our lifetimes, to let go of one's own name like a childhood plaything. Rilke, though long gone, has certainly kept me company over the past few years. I think one of the things I'm trying to communicate to people with my work is that we're not here for very long and that we should pay attention. I mean, it's completely extraordinary to be here at all - alive among all this. But there's a whole other thing that's happening now in terms of my awareness of ageing - a strange new pressure I feel because of my ever deepening relationship with this land, with my farm. I only have 30, maybe 35 years, to plant trees here, and see how they grow and how this land changes. And I know when planting oaks or sugar maples I will not live long enough to see them to maturity, even that *Osmose* oak.

As a result of that, I feel a sense of urgency. Working with the land is becoming as important to me as making artwork, and I think that's why I now want to bring the work and the land together, I want to make artwork not only about that land, but on that land, to allow the land to seep even more strongly into my work. But one last thing I should say here is that I also feel a deep responsibility for my land. I'm actually working on a plan where when my own life ends, this land I love would be kept safe from developers, safe in perpetuity, perhaps as a nature reserve, perhaps as a place where artists, writers and biologists could retreat and do research. So I'm aware of my mortality and of how this land will endure while I am just a flicker.

Carol Gigliotti: Does this view of a greater history bear any relationship to your view of the art world ? Or your own position within it?

Char Davies: My work is not addressed to the art world as such. If anything, it is a very solitary conversation I'm having with the universe. When I was a young artist, I went my own way, off to the remote logging camps of Vancouver Island in British Columbia to paint the forests and the men working in them. Instead of working my way up through the gallery scene, I took a detour and became involved in building a software company. This saved me from the probable fate of being a poor and starving artist all of my life; it also gave me access to the technology I'm using. My work shows in museums around the world and has been widely reviewed in art journals etc. but art world or no art world, I'm doing what I'm doing because I am compelled.

Over the course of the past 25 years, I have sought consolation and encouragement in the work of certain artists, though these days I find I have more in common with architects and landscape designers because they are working in real three-dimensional space. One of my favourite artists is Turner, because Turner was, by the end of his life, painting light and time in space. I don't think anyone has ever surpassed him in that. Another artist I really respect is James Turrell, who also has always worked with light in space, and with perception of course. I'm especially intrigued by what he's doing with his crater out west. I'm also interested in artists who are working with land, making earthworks as well as landscape designers like Olmstead and traditional Japanese gardens. I have always sought company in the work of poets and philosophers, especially those writing about nature, place and the environment, perception, embodiment and spatiality. But these days, the most central conversation I'm having is with my land.

Carol Gigliotti: Could you say how you plan to develop this dialogue in future works?

Char Davies: This conversation I'm having with the land is spoken through its flow of seasons, its bloomings and witherings, its inhabitants, the presence and absence of light. In this constant negotiation, the boundaries between my work and nature, between the virtual and the real are becoming interfused, intertwined, intermingled. In the past month, actually, I've decided to build a barn, and integrate a studio-lab into its structure. This way, *Reverie* itself will become not only the creative heart of future work but the practical hub as well. Having gone as far afield as the Australian outback, the African Okavango delta and the Arctic in search of a site to base a new work upon, I have finally decided to make it at Reverie. While my next project will no doubt evolve as the land itself plays a determining role as "*co-artiste*", the plan is to place sensing devices in the fields and woods and ponds to remotely record seasonal transformation, changes in temperature, wind flow, precipitation, light, darkness, phases of the moon etc., and if we are able, the dynamic presences of animals as well, and use that information to actually drive - though I don't like that word - to feed an immersive virtual manifestation of the land, behind the veil of appearances. So even

if people go into the work in some far off city, they can experience the quivering of this land, in its many layers, live. I also want to incorporate data from the participant's own body, thus taking the breathing metaphor further to suggest that the earth is our body, that we are one and the same. I want to convey that it is only by going deeper into what I call the "***the presence of the present***", by stilling ourselves and paying attention, that we can really feel ourselves being here. Ultimately my goal is to use the medium of immersive virtual space as a means of enabling this refreshing of perception, for changing psychological space in the sense meant by Bachelard. To remind myself and others how extraordinary it is to be here.

Osmose (1995) by Char Davies.

Produced with Softimage.

Custom VR software by John Harrison.

Computer graphics by Georges Mauro.

Sonic architecture/programming by Dorota Blaszcak.

Sound composition/programming by Rick Bidlack.

Ephémère (1998) by Char Davies.

Produced with Softimage.

Custom VR software by John Harrison.

Computer graphics by Georges Mauro.

Sonic architecture/programming by Dorota Blaszcak.

Sound composition/programming by Rick Bidlack.

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Rethinking VR: Key Concepts and Concerns by Char Davies

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.

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?

Verona Andematt 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 3-D digital imagery characterized by semi-transparency, and interactive 3-D localized sound. *Ephémère* also employs gaze and participant proximity/speed as an interactive mode.) [1]

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 3-D 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. [2] 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, 3-D 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 un-relatedness", 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 *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*, Verona 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” (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 *Osrose* 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, *Cezanne*, 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 immersion 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 Eudidian space) and as the geometrical domain of xyz coordinates (as in the technology of 3-D 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*. [5]

As the geo-philosopher Edward Casey writes in *Body, Self, and Landscape: A Geophilosophical 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 an 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 spatiotemporal 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. [6] 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. [7]

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 immersion, immateriality and interactivity – as a facilitating or enabling spatial-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 Kraucauer, *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 de-stabilizing 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, 3-D 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 & 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 forthcoming book *Char Davies' Immersive Art and the Essence of Spatiality: Elemental Dynamics in Osmose and Ephémère*.

[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 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*, 3rd ed. 1987 Cambridge MA: Harvard University Press.

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LANDSCAPE, EARTH, BODY, BEING, SPACE AND TIME **IN THE IMMERSIVE VIRTUAL ENVIRONMENTS OSMOSE AND EPHÉMÈRE**

By Char Davies

Osmose and *Ephémère* are immersive and interactive virtual-reality environments.¹ These works are known for their embodying interface, painterly aesthetic, and themes of nature. They are the most recent fruits of an artistic project that I have been engaged in for almost twenty years and that has encompassed painting, film, and making three-dimensional computer graphics and animation.

The impulse behind this project has been to communicate an intensified experience of being embodied in the space-time of the living world. *Osmose* and *Ephémère* are my attempts to distill and amplify the sensations and emotions of being conscious, embodied, and mortal—that is, how it feels to be alive here now among all this, immersed in the vast, multichanneled flow of life through space and time. In these works, I seek to remind people of their biological, spiritual, and psychological connections to the natural (rather than human-made) environment and of the regenerative source and mythological ground of those connections.

For nearly a decade, I attempted to communicate this sensibility through the medium of painting. The practice of painting and its mode of apprehending the world has significantly informed my entire approach to VR. Evidence of the themes of *Osmose* and *Ephémère* can be found in my work as early as 1975, and their visual aesthetic appears as early as 1981, when I turned my attention as a painter to investigating my own extremely myopic eyesight. In doing so, I was initiated into an alternative experience of space whereby "objects" had apparently disappeared and where all semblance of solidity, surface, edges, and distinctions between things, including figure and ground—all the usual perceptual cues by which we objectify the world—had dissolved. In their stead was a sense of space without sharply defined, separate objects in empty space and with an ambiguous intermingling of varying voluminous luminosities and hues. Within this spatiality, there is no split between the observer and the observed. The withdrawal of the sense of sight—of the visual acuity that dominates the human relationship with the world and is tied to the Cartesian paradigm—allows another way of sensing to come forward, one in which the body feels space very much like that of a body immersed in the sea.² This alternative mode of perceptual spatiality has profoundly influenced my work.

In the mid-1980s, I exhibited a series of paintings called *Espaces Interlacés* (Interlaced Space). This body of work attempted to communicate a subjective experience of the intermingling of interior self and external world, of body and nature. To this end, I developed painting techniques based on the application of layers of oil pigment alternating with the

¹ By "immersion" or "immersive virtual space", I mean immersion in a 360 degree spherically-enveloping virtual environment, in my opinion possible at the present time only through use of HMDs (head-mounted displays) with wide fields of view. While less cumbersome techniques are under development, current alternatives such as wrap-around screens or domes (now known as Spatially Immersive Displays) are not as effective in achieving a sense of envelopment. My comments in this paper refer to full-body immersion through use of HMDs.

² This experience bears resemblance to Merleau-Ponty's description of night, as published in *The Phenomenology of Perception*, London: Routledge & Kegan Paul (1995), p.283:

"When, for example, the world of clear and articulate objects is abolished, our perceptual being, cut off from its world, evolves a spatiality without things. This is what happens in the night. Night senses, stifling my recollections, and almost destroying my personal identity. I am no longer withdrawn into my perceptual outlook from which I watch the outlines of objects moving by at a distance...it is pure depth without foreground or background, without surfaces and without any distance separating it from me."

dissolving and sanding away of certain areas, using the resulting semitransparent and semiabstract/semi-representational effect to create spatial and conceptual ambiguity. In this work, I also sought to reconstruct the sensation of being encircled by horizon, of being sensuously, spatially enveloped. The two-dimensionality of the painterly picture plane, however, ultimately posed an insurmountable limitation to the achievement of this goal. Consequently, I abandoned the medium of painting for that of 3D computer graphics—a medium that offered the possibility of creating in virtual three-dimensional space on the other side of the picture plane.

In late 1987, I became a founding director of a start-up computer graphic software company, Softimage, becoming its first director of visual research. Learning to use the young software by cowriting its first manual, I eventually resumed my own work in the form of three-dimensional computer graphic images composed and rendered as stills. Between 1990 and 1993, I produced a series of 3D stills titled *The Interior Body*, dealing with metaphorical correspondences between body and earth, the same themes that were present in the earlier paintings and that reoccur in *Osmose* and *Ephémère*. As an artist who had already developed a particular visual aesthetic style, I instinctively and immediately bypassed the usual 3D computer graphic techniques. These images were created by making 3D cg models and placing them in three-dimensional space, as if constructing props and arranging them along with lights on a virtual theater set. Rather than creating solid-surfaced objects, however, and separating them in empty Cartesian space, I worked with transparency (as I had while painting) and textured shadow casting to create spatial ambiguity, merging objects and space, figure and ground. These three-dimensional constructions were composed much like a painting, from a fixed point of view with great consideration given to the framing. The resulting compositions were rendered and output to film as transparencies and exhibited as large-scale light boxes. (Along the way, I also collaborated on the 3D computer-animated film *West of Eden* produced at Softimage.) While these images were created in virtual 3D working space, they were output through photographic media as two-dimensional Duratrans stills, thus defeating my original intent. And so, seeking a more effective means with which to communicate a subjective sense of enveloping spatiality, I began to work with Immersive VR, or what I prefer to call *immersive virtual space*.

In my experience of constructing virtual environments, the medium of Immersive VR offers a unique means of expressing this particular sensibility. This is primarily because of the medium's enveloping spatiality, a spatiality that seemingly allows viewers to enter it, and because of its kinesthetic and interactive properties. As a means of distilling and amplifying the sensations and emotions of being conscious, embodied, and mortal, of heightening sensations "of the body as the site of consciousness occupying space,"³ Immersive VR is far more effective than any other artistic medium I have used. Just as the invention of film—through the technology and craft of photography—extended the stillness of painting into the flow of time, the technology associated with immersive VR extends beyond the two-dimensionality of painting and film into enveloping "circumferal" space. In virtual space, the artist designer can construct three-dimensional, animated, conceptual models of the world, manifesting them within a virtual spatiotemporal arena where they can be kinesthetically explored by others through real-time interaction and full-body immersion. The viewer thus becomes a participant within the artist's world. This is particularly so when approached through an embodying (rather than disembodied) user interface such as that of *Osmose* and *Ephémère*. In works such as these, perceptual boundaries between inside and out may be experienced as permeable because the virtual and immaterial are confused with the bodily

³ Yasmin Kharim, 1995. Private correspondence.

felt, experienced as strangely real. This is the paradox of immersive VR and its singular power.

The origins of the technology associated with virtual reality lie in the military and Western scientific-industrial complex: VR is not neutral but by default carries Cartesian values.⁴ It should not be surprising, then, if most of the metaphors—spatial, visual, interactive—used in conventional VR design reinforce what Henri Lefèbvre called “the reign of King Logos.”⁵ In this context, virtual reality can be read as a “literal enactment of Cartesian ontology,”⁶ the product of the collective consciousness of Western culture issuing from “a techno-utopian ideology ripe with subconscious perceptions and prejudices in which liberation is sought from the body [and earth] by dissolving into the machine.”⁷ When constructed by artist designers who are aware of the technology’s debt to King Logos and who deliberately choose to circumvent its conventions, this medium can effectively be used to convey alternative worldviews, acting as a countering philosophical tool. In *Through the Vanishing Point: Space in Painting and Poetry*, Marshall McLuhan wrote that the role of artists was to create “counterenvironments” to open the doors of perception by correcting the unconscious bias of a given culture. He went on to say that in an age of accelerated change, the need to perceive the environment becomes ever more urgent.⁸ Similarly, Lefèbvre, in his seminal book *The Production of Space*, called for the production of anti-environments and “counterspace” in the face of the homogenizing absolute space of Western metaphysics.⁹ Since these words were written, the paradoxical medium of VR, with all its implications, has emerged.

In my work, I have attempted to push VR beyond its conventions to present a different interpretation of being in the world. In terms of content and sensibility, *Osmose* and *Ephémère* are a far cry from the adrenaline-pumping techno fantasies common in VR. *Osmose* and *Ephémère* shun conventional hand-based modes of user interaction, which tend to reduce the body to that of disembodied eye and probing hand, in favor of an embodying interface that tracks breath and shifting balance, grounding the Immersive experience in the participant’s own body. *Osmose* and *Ephémère* avoid the hard-edged mimetic realism toward which most VR aspires, instead relying on semiabstract semitransparent figuration to create an ambiguous, evocative painterly aesthetic that actively engages the participant’s imagination in the work.

Osmose and *Ephémère* were constructed with a team at Softimage Inc. in Montreal from 1994 to 1995 and 1996 to 1998, respectively. The graphics and animations were created by Georges Mauro using Softimage’s 3D animation software; these were adapted to real-time VR through custom programming by John Harrison. Rick Bidlack composed and programmed the

⁴ Numerous writers have pointed out the technology’s tendency toward reinforcement of the Western world view, including Katherine Hayles, “The Seduction of Cyberspace.” *Rethinking Technologies*. Ed. Verena Andermatt Conley. University of Minnesota Press, 1993; and Hayles, “Narratives of Artificial Life.” *FutureNatural*. Ed. G. Robertson et al. Routledge, 1996. Also see Margaret Morse. “Landscape and Narrative in Virtual Environments.” *Immersed in Technology*. Ed. Moser. MIT Press, 1996. My experience in the late 80’s of building a software company into the world’s leading developer of 3D computer animation software led me to understand the potency of this technology in reinforcing traditional Western/scientific values.

⁵ Henri Lefebvre, 1991. *The Production of Space*. Oxford: Blackwell.

⁶ Richard Coyne, 1994. “Heidegger & Virtual Reality: The Implications of Heidegger’s Thinking for Computer Representations.” *Leonardo*, Vol.27 (1) (1994): p.68.

⁷ Ziauddin Sardar. “alt.civilizations.faq: Cyberspace as the darker side of the West.” *Cyberfutures: Culture and Politics on the Information Superhighway*. Eds. Z. Sardar, and J. R. Ravetz. London: Pluto Press, 1996. p.34

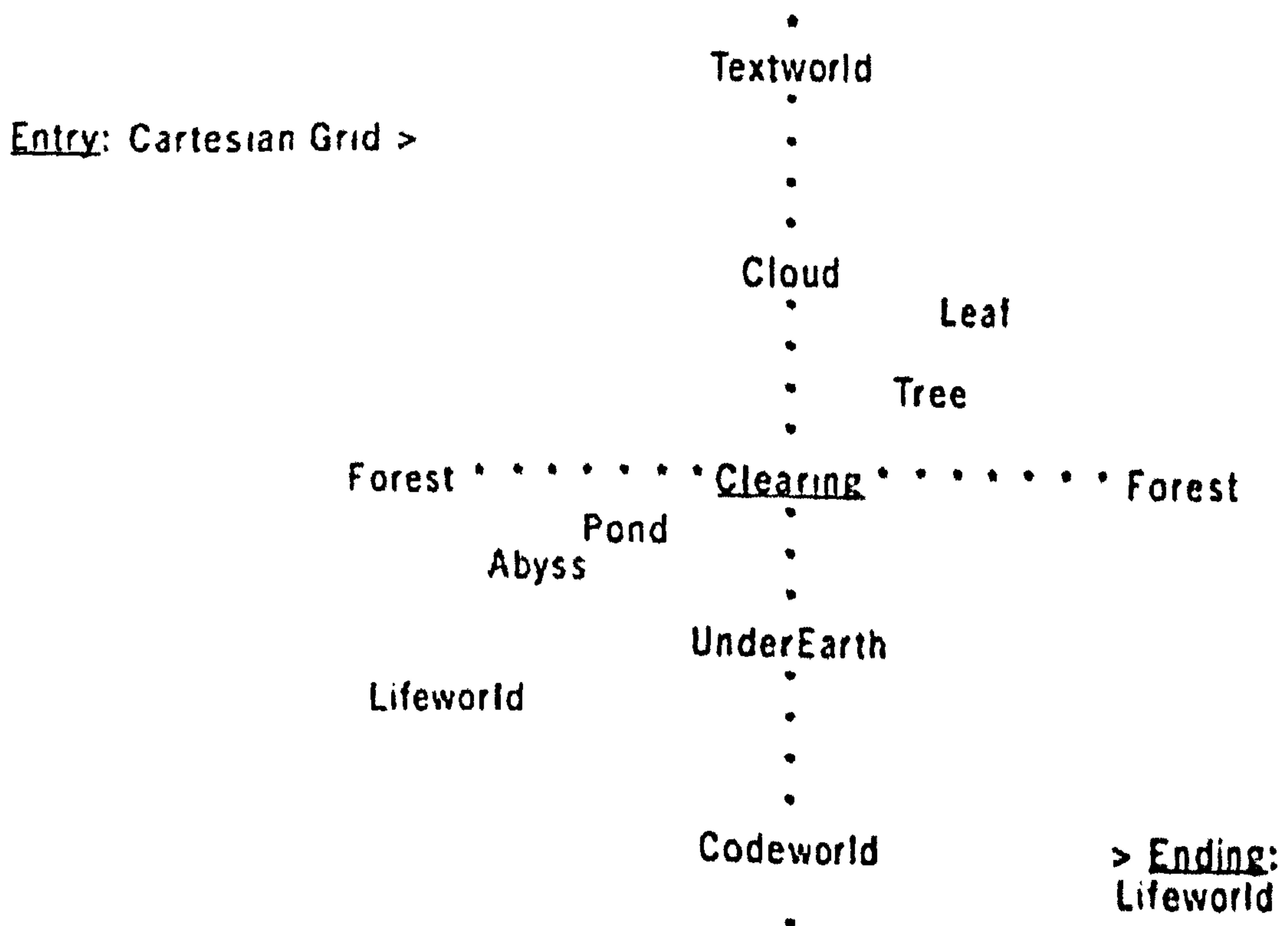
⁸ Marshall McLuhan, and Harley Parker. *Through the Vanishing Point: Space in Poetry and Painting*. New York: Harper & Row, 1969: pp.241, 252 (The words quoted here originally addressed to the creators of psychedelic light shows).

⁹ Henri Lefebvre, p.407.

sound, and Dorota Blazszczak designed and programmed the sonic architecture. *Osmose* was produced by Softimage. *Ephémère* was coproduced by Softimage and my company Immersence Inc. Both works originally ran on a Silicon Graphics Infinite Reality parallel-processing computer, with a stereoscopic and stereo-sound headmounted display and now have been successfully ported onto a PC, with a stereoscopic and stereo sound head-mounted display. We designed a user interface that motion-tracks the participant's breath and balance (breathing in to ascend, out to descend, leaning to change direction. The use of conventional hand-based interaction was deliberately avoided. The sound uses a PC (or a Mac in the case of *Osmose*), a Kurzweil sound synthesizer and processor, and an Acoustetron for localizing the sounds in real time in three-dimensional space.

The central experience is that of the immersed participant—the "immersant." During public exhibitions, this rather intimate experience takes place in the company of an attendant in a small private chamber facing a larger audience space of relative darkness with two luminous screens. This public space is filled with sound, as it is generated in real time by the immersant's behavior in the virtual space. One of the screens is a stereoscopic video projection of the three-dimensional world as it is experienced by the immersant, enabling museum visitors to vicariously witness each immersive journey as it takes place in real time. The other bears the projected shadow of the immersant's silhouette as he or she moves and gestures in response to the work. The use of this shadow silhouette alongside with the real-time video projection serves to poeticize the relationship between the immersant body and the work, drawing attention to the body's role as ground and medium for the experience.

To experience *Osmose* or *Ephémère*, the participant dons a stereoscopic helmet through which the computer-generated 3D graphics and 3D sound are displayed in real time according to their breathing in and out and to their shifting center of balance, both of which are tracked by sensors mounted on a vest. There are no gloves, and there is no phallic joystick.



Spatial Structure of Osmose

The first virtual realm encountered by the immersant in *Osmose* is a three dimensional Cartesian grid that functions as an orientation space and makes reference to the technology's origins. With the immersant's first breaths, the grid gives way to a clearing. In the center of the clearing is a tree, into whose leaves it is possible to enter. Surrounding the clearing is a forest, which when entered is never-ending in all directions including up or down, except by following a stream or by becoming still and waiting for time to pass. In the clearing there is also a pond into which one can sink (by breathing out) and then descend deeper into an oceanic abyss in which a symbolic life-world appears through which one can return to the clearing with its pond, stream, and tree. It is also possible (by breathing in) to ascend into white cloud—or, by breathing out again, to descend into subterranean earth, passing roots and rocks and underground streams. Two other realms—above and below, of text on nature, technology, and the body and of software code—function as the conceptual substratum and superstratum parenthesizing the work. The sounds within *Osmose* were sampled from a male and female voice uttering phonetics and digitally processed to create a range of effects and localized in three dimensional space. Sound is generated on the fly, in real time, responding, like the visuals, to changes in the immersant's head position, spatial location, direction, and speed. Using breath and balance, immersants are able to float or hover through all the virtual realms and in the overlapping areas between. After fifteen minutes of immersion in *Osmose* (during public installations), the life-world reappears and then irretrievably recedes, bringing the session to an end.¹⁰

Entry :	temporal >>>	Winter	>	Spring	>	Autumn	>	Ending
spatial								
level one:								
Forest Landscape:		swamp	>	forest, river, boulders	>	falling trees	>	falling leaves
.								
level two:								
Subterranean Earth:		earth, roots, rocks, underground stream, seeds	>	falling embers				
.								
level three:								
Interior Body:		interior flesh, organs, bloodstream, eggs, bones	>	falling ash	>	dust		

Spatio-temporal structure of Ephémère

In *Ephémère*, the iconographic repertoire is extended beyond the trees and rocks and streams of *Osmose* to include body organs, blood vessels, and bones, suggesting a symbolic correspondence between the chthonic presences of the interior body and the subterranean earth. While *Osmose* consisted of nearly a dozen realms situated around a central clearing, *Ephémère* is structured spatially into three levels—landscape, earth, and interior body. The body functions as the metaphoric substratum under the fecund earth and the lush bloomings and witherings of the land. Unlike *Osmose*, *Ephémère* is also structured temporally. Even as the immersant roams among all three realms, no realm remains the same. The landscape changes continually, passing through cycles of dawn, day, evening, and night, from the pale of winter through spring and summer to the climatic decay of autumn. While participants may spend an entire session in one realm, it is more likely that they will pass constantly

¹⁰ For more information on *Osmose*, see Davies, 1995, "Osmose: Notes on Being in Immersive Virtual Space." In *Digital Creativity*, Vol.9(2) (1998). First published in the Sixth International Symposium on Electronic Arts Conference Proceedings, Montreal, ISEA '95.

between them, immersed in transformation. Throughout the work, the various rocks, roots, seeds, and so on come into being, linger, and pass away. Their appearances depend on the immersant's vertical level, proximity, slowness of movement, and steadiness and duration of gaze.

All the transformations and interactions in *Ephémère* are aural as well as visual. While the visual elements pass through varying phases of visibility and nonvisibility, light and darkness—and in the case of the landscape, progress from the more literal to the abstract—the sound is also in a state of flux. Localized in three dimensions and fully interactive as in *Osmose*, sound oscillates between melodic form and mimetic effect in a state somewhere between structure and chaos, adapting moment by moment to the spatiotemporal context of the immersant within the work. *Ephémère* is more interactive than *Osmose*. When gazed on, its landscape rocks transform into other landscapes; seeds activate when gazed on for an extended length of time, rewarding patient observation with germination, inviting entry into the luminous interior space of their bloom. The only constancy is the ever-changing river: when the immersant surrenders to its gravitational flow, it metamorphoses from river to underground stream or artery/vein and vice versa, summoning in the corresponding visual and aural elements of each realm. Deep within the earth, rocks transform into pulsing body organs, eggs appear, and aging organs give way to bone. Depending on the immersant's behavior within the work, there are several endings, of falling leaves, of ashes, and of dust.

The visuals in these works are soft, luminous, and translucent, consisting of semitransparent textured 3D forms and flowing particles: the 3D forms have been designed to be neither wholly representational (that is, recognizable) nor wholly abstract but to hover in between, creating perceptual ambiguity. By animating these forms and by enabling the participant not only to see through them but to float through them as well, it is possible—because of their varying degrees of transparency—to create spatially ambiguous figure and ground relationships. The resulting constant variability of the perceptual field causes semiotic and sensory fluctuations, or what I call "perceptual buzz," in which multiple poetic associations may be evoked—for a single literal meaning closes the work, whereas ambiguity invites further imaginative play. In my work, ambiguity is key to softening, lessening, the distinctions between things. This strategy, developed through years of painting, serves to offset the cultural bias of dualism, of maintaining rigid boundaries between subject-object, I-it, which finds expression in the aesthetic of "hard-edged objects in empty space" so common in three-dimensional computer graphics (an aesthetic clearly embodied in the dinosaurs of *Jurassic Park*).

In regards to the interactive methodology of *Osmose* and *Ephémère*, rather than relying on conventional hand-based VR interface methods such as joystick, wand, trackball, or glove—which tend to support a disembodied, distanced, and controlling stance toward the world—we developed an interface that is body-centered and that relies on the intuitive, instinctual, visceral processes of breathing and balance. Through breath, the immersant is able to rise and fall in space with ease and precision. By subtly altering the body's center of balance, the immersant is able to change direction. This reliance on breath and balance is intended to reaffirm the role of the living physical body in immersive virtual space, as subjective experiential ground. It is also intended to act as a channel of communion rather than as a tool 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.¹¹ This strategy has been informed

¹¹ David Michael Levin, 1985. *The Body's Recollection of Being: Phenomenological Psychology and the Deconstruction of Nihilism*. p.274:

"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,

by my own experiences of scuba diving and has many implications for the work as a whole, both on an instrumental level and in terms of metaphor. The experience of immersion in the deep sea, via scuba diving, has significantly shaped my conceptual approach to VR. While diving, the hands are rarely used because touching often means doing or receiving harm; the vertical axis of movement is more important than the horizontal, and one's buoyancy is dependent on skillful use of breath and balance to rise or fall or turn. Most of all, one feels the exquisite sensation of floating instead of being gravity-bound, of being sensuously immersed in the big blue. Here, space is not perceived as empty or passive but sensually embraces, envelops the whole body, inviting reverie and surrender of the self in rapture of the deep.

Since 1995, nearly twenty thousand people have been individually immersed in *Osmose* and in *Ephémère*. The responses of many participants initially caught us by surprise, in terms of their emotionality, including euphoria and tears of loss. Not only do the works' reliance on breath and balance facilitate relaxation, but they also tend to facilitate a mental state in which logical, rational, goal-oriented behavior is abandoned for perceptual free-fall. In comparing participant responses with psychological research into traditionally induced altered states of consciousness such as meditation, it appears that full-body immersion in an unusual virtual environment (that is, one that does not seek to reproduce literal appearances and habitual behavior in the real world) can facilitate shifts in mental awareness.¹² In this state, it appears that perceptual "dehabituation" allows perceived boundaries between interior and exterior, mind and body, self and world, to become permeable. These parallels have been explored in a previous paper.¹³

The intertwinings of the imaginative and the physical, the immaterial and the material, lie at the heart of *Osmose* and *Ephémère*. These works have been nourished by my experience of an actual space, a place partly cultivated, partly wild, on the slope of a mountain in southern Quebec. Though this land is not pristine by any means—having been cleared by settlers in the eighteenth century, mined for copper, logged for furniture, grazed by cattle, farmed for apples, its meadows rooted with European "aliens," and its nonhuman predators, cougars, wolves, and bears, hunted out long ago—the elements of *Ephémère* and *Osmose* have their source here. This land's trees and roots and rocks, its ponds and mountain streams, its bloomings and witherings through time, have become numinous, as present in my imagination as in actuality. As I ramble among their physical manifestations throughout the

porous, each time one takes a breath. The air is constantly transgressing boundaries, sustaining life through interconnection. One may have spent years studying the mystics on the unreality of dualism and have this remain an abstract idea. But in following breath, one begins to embody this truth."

"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 defenses, 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 favored with a deeper experience of beings, and the presencing of Being as such."

¹² Arthur Deikman, 1990. "De-automatization & Mystical Experience." *Altered States of Consciousness*. Harper Collins.

¹³ Char Davies, "Changing Space: VR as an Arena of Being," in John Beckman, ed., *The Virtual Dimension: Architecture, Representation, and Crash Culture* (Boston: Princeton Architectural Press, 1998), and in abbreviated form, in R. Ascott, ed., *Consciousness Reframed: Art and Consciousness in the Post-biological Era. Proceedings of the First International CAIA Research Conference* (Newport: University of Wales College, 1997).

seasons and flowing light, they in turn appear in my work like apparitions in a haunting reciprocity between the virtual and the real.

On this land, however, fewer birds arrive each spring; the frogs and toads have fewer young; and the maple trees are dying of acid rain from smelters in the American Midwest. This land is but a microcosm: worldwide, wild places of the earth are being dramatically altered due to a litany of human attitudes and actions.¹⁴ Meanwhile, public attention is being directed to the virgin, untrampled territory of cyberspace. And what of virtual reality? Can virtual representations of nature return our attention to the nonhuman living world—conversely increasing our appreciation of the complexities of the natural environment? Or will virtual environments proliferate at the inverse rate of the disappearance of the real—as some sort of psychic compensation? Perhaps the very act of creating virtual environments such as *Osmose* and *Ephémère* point out the danger that soon computer-generated simulations may be all we have left.¹⁵

When I first began writing about *Ephémère*—before its completion—it was springtime, and apple blossoms were drifting gently on their boughs. As I write these words now, the apples have already ripened, been harvested, and fallen and rotted, and the withering leaves of Canadian autumn are trickling through the October sky. I write on a laptop electronically connected to the human world, and yet I am alone with an encircling horizon of woods and fields surrounding me. Voices from digital recordings of the seventeenth-century compositions of Pergolesi ring out, interlaced with the rustlings of wind, the flowings of water over mountain stone, and the occasional sound of a hunter's rifle shot. As much as I try to focus, the land keeps calling me—away from keyboard and mouse pad, virtual reality, and the abstraction of words—out into the sensations of nature, winds on my skin, scents of decaying vegetation, and the presences of its inhabitants going about the business of their lives. Waking up the other morning, I looked out the cabin window and thought I was inside the autumnal flux of *Ephémère*—the external internalized and re-externalized as art.

As I reread these words, I sit at the roots of a solitary maple tree among its crumpled ochre leaves, in the gathering violet light and tranquillity of dusk broken only by the sound of the international flight path of transatlantic jets—watching for the deer to venture from the safe shadows of the woods into the soft evening meadows of the orchard. I wait for the deer and all the other creatures who pass through here, strands of multi-channeled life, life as a river with infinite rivulets pouring through time. These are the living presences who are so absent in the human-made virtual environments of *Osmose* and *Ephémère*.

¹⁴ In October 1998, newspaper headlines announced that PCBs and other persistent toxic chemicals—from as far away as South America—have been found in extremely high concentrations in the uppermost altitudes of the Rocky Mountains, imagined until now to be untouched by man. *Globe and Mail* (Toronto), 17 October 1998.

¹⁵ Laurie McRobert, "Immersive Art and the Essence of Technology," in *Explorations: Journal for Adventurous Thought* (Fall 1996).

Espaces Entrelacés: VR as Poiesis (abbreviated version)

by Char Davies

Heidegger warned of technology's tendency to function as an instrument of domination laying waste to the natural world. His words resonate as I write on my laptop in the middle of a forest by the edge of the Pacific in British Columbia among sweet cedar, hemlock, fir and fern. Though encircled by a sea of noise, crisscrossed by communication transmissions, and tainted by Vancouver smog, this small pocket of ancient growth is palpably *other*.

Such fecund places are receding as tangible territory and as mythic elements of symbolic desire and dread. We scarcely notice the threads that ground our mortal bodies to the living earth, as our attention is diverted to hi-tech wonders, and the replacement of living nonhuman others with things of our own making. VR may well further the destructive trajectory which Heidegger signposted, distract from earthly crises by substituting the virtual for the real, and prove to be the nemesis of nature.

But Heidegger wrote also of an earlier techné, called "poiesis" by the Greeks, associated with a poetic bringing forth or revealing. Encouraged by his words, I have explored an alternative VR — a means of bringing forth" subjective experiences of the natural world. My work is grounded in caring for 400 acres of semi-wild land in southern Quebec, a landscape whose natural features and unseen animal presences populate the virtual spaces of *Osmose* and *Ephémère*. These works reveal a reciprocal link, un espace entrelacé, by which virtual landscape manifests my own responses to a real place.

In *Osmose* and *Ephémère*, virtual embodiment is kinesthetically explored through full-body immersion and interaction. I use participants' breath as interface (enabling them to "float"), and semi-transparency to evoke cognitive ambiguity, reaffirming the role of the subjectively lived body within the virtual realm's evocation of nature. And, while *Osmose* is an exploratory step, *Ephémère* goes further in reaffirming a poetic and mythic need for nature's otherness, returning attention to our fleeting existences as embodied beings embedded in a living and sensuous world.

Espaces Entrelacés: VR as Poiesis (original text submitted for publication)

*... just because to be here means so much,
and everything here, all this that's disappearing seems to need us
to concern us in some strange way - we, who disappear even faster!*

*It's one time for each thing and only one. Once and no more.
And the same for us: once. Then never again.
But this once having been even though only once having been on earth
seems as though it can't be undone.*

*Earth, isn't this what you want: rising up inside us invisibly once more?
Isn't it your dream to be invisible someday? Earth! invisible!
what is it you urgently ask for if not transformation?*

*Rainer Maria Rilke, excerpted from The Ninth Elegy, The Duino Elegies, 1922
Translated by David Young. (New York: Norton, 1978.)*

I write on my laptop in the middle of a forest. By the edge of the Pacific in British Columbia among sweet cedar, hemlock, fir and fern. Though encircled by a sea of noise from cars boats planes jets, crisscrossed by an inaudible cacophony of radio television telephones satellites, and tainted by Vancouver smog, this small pocket reserve of ancient growth is cool, calm, still, and *other*. While not pristine by any means, it stands apart from our world of speed, technology and information. Protected here from short-term human greed, these trees follow a slower deeper time, of a past and future beyond our life spans, carrying meanings we no longer know.

Such fecund places, once boundless and infinitely fruitful, once the archetypal stuff of dream, are receding further from our grasp. Not only diminishing in territory and biological diversity, but as mythic elements of imagination, of symbolic desire and dread. Always the 'other' with which humankind has wrestled throughout history, non-manmade nature in its myriad of forms seems to be withdrawing its presence and mystery from our lives, even while speaking more loudly on a climatic and viral scale. We scarcely notice as our cultural attention is diverted elsewhere, forging new myths of hi-tech wonders, replacing living non-human others with things of our own making (finally man-as-god), the cyber-din of our own babble drowning other voices from the planet. We do not see the loss. We do not see the shining threads that bind us, ground us mortally, bodily, to this unfathomable earth and all its creatures.

Heidegger warned of technology's tendency to function as an instrument of domination laying waste to the world ('nature as standing reserve'). The technology associated with 'virtual reality' may well further this trajectory with its capacity to reinforce cultural values of (male) domination and control, and distract from earthly crises and concerns by substituting virtual for the real. As such, VR may well prove to be a nemesis of nature as we have known it. (On the other hand, migration of the masses into artificial realities may prevent the trampling of wildernesses into nonexistence, but more likely, less and less first-hand familiarity with the natural world will increase indifference among urban dwellers.) In an attempt to imagine the proverbial glass half full rather than empty, it helps to remember that Heidegger wrote also of an earlier techne, called 'poiesis' by the Greeks, associated with a poetic bringing forth or revealing. Encouraged by his words, and those of the poet Rainer

Maria Rilke and the philosopher of symbolic matter, Gaston Bachelard, I have explored an alternative VR -- approaching the medium as a means of facilitating or 'bringing forth' subjective experiences of being in the natural world which might transcend our culturally-tinted lenses of perception and behaviour.

I imagine virtual space as a philosophical yet participatory medium, a visual/aural spatio-temporal arena wherein mental models or abstract constructs can be given virtual embodiment in three dimensions and then be kinesthetically explored by others through full body immersion and interaction, even while such constructs retain their immateriality. My interest lies in going beyond VR's conventions of photo-realism and joystick Interfaces which situate the user as a probing hand (with gun) and disembodied eye among passive hard-edged objects in empty space. By working with the participant's breath as primary Interface (enabling them to 'float'), and using semi-transparency as a means of evoking cognitive ambiguity, I have sought to reaffirm the role of the subjectively *lived* body within the virtual realm and deeply engage the participant's sensory imagination. When approached as a means of enabling people to temporarily transcend their everyday habitual perceptions -- which tend to lead to a forgetting of how extraordinary it is to be here, so briefly, among all this -- it is my hope that the paradoxical qualities of bodily Immersion in virtual space might lead to an experience of being-in-the-world *freshly*, as Aldous Huxley wrote in his potent little book *Doors of Perception*.

From my own perspective, there is no contradiction between my constructions in virtual space and a physical remnant of primeval forest in West Vancouver. Rather I see a reciprocal link, *un espace entrelacé*, in which each virtual landscape is a manifestation -- distilled, amplified, abstracted -- of my own emotional and conceptual responses to a real place, a searching for understanding of the symbiotic and encompassing life processes which I imagine and can almost sense. My work in virtual space is, of necessity, psychologically grounded in an ongoing apprenticeship in caring for four hundred acres of rural, semi-wild land on a mountainside in southern Québec: a landscape whose ever-changing woods and streams and ponds and meadows and unseen unheard animal presences populate the virtual environments *Osmose* and *Ephémère*. And while I consider *Osmose* to be an exploratory step, in *Ephémère* I attempted to go further, not in terms of substituting the virtual for traces of the real, but in reaffirming a poetic and mythic need for nature's other, in the hopes of returning attention to our fleeting existences as embodied mortal beings embedded in a delicately-balanced living and sensuous natural world.

Ephémère: Landscape, Earth, Body, and Time in Immersive Virtual Space

*But just because to be here means so much,
And everything here all this that's disappearing
Seems to need us, to concern us in some strange way
We who disappear even faster!
It's one time for each thing and only one.
Once and no more. And the same for us. Once.
Then never again.
But this once having been,
Even though only once having been on earth
Seems as though it can't be undone.*

*... Earth, isn't this what you want:
Rising up inside us invisibly once more!
Isn't it your dream to be invisible someday!
Earth! Invisible!
What is it you urgently ask for
If not transformation!*

Rainer Maria Rilke [1]

Ephémère is an interactive, immersive audio/visual virtual environment which furthers the work begun in *Osmose* (1995).

In Ephémère there are two intertwined themes. One is the ephemerality of being, in terms of our fragile fleeting life spans as mortal beings embedded in a living, flowing world, among an unfathomable myriad of comings-into-being, lingerings and passings-away. The work's second theme is the symbolic correspondence between body and earth. Earth as regenerative source, organic destiny, mythological ground, Within the work are recurring archetypal elements suggesting a co-equivalency between the chthonic presences of the interior organic body and the subterranean earth, whose meanings and behaviours are dependent on the behaviour of the participant and spatial/temporal context.

Ephémère is structured as a temporal progression, in terms of emergence and withdrawal of form: flow and ebb of visibility and audibility: and diurnal/nocturnal and seasonal transformation, as well as germination and decay While the ephemeral is most usually associated with momentary manifestations such as mayflies, from a mountain's point of view, our own lives are as fleeting.

Nature as Ground

The iconography of Ephémère is grounded in 'Nature' as metaphor, as is all my work of the past 15 years, as a means of reaffirming our biological and psychological dependency on Nature in the face of its ongoing devaluation and destruction.

No matter how far culture will go to destroy its connections to nature, humankind and all of our technology, good and bad, are inextricable parts of nature the original, determinant, the mother and matrix of everything, that all pervasive structure that lies beneath scenery, landscape, place and human history. [2]

Ephémère is fuelled by my experience of a particular place, a remote piece of land, part rural, part wild, in southern Quebec. While this land is not pristine, having been logged, cleared, ploughed, mined and grazed and now producing apples, all the earthly elements in Ephémère, as in Osmose, have their source here. Over the time I have spent on this land, its roots and rocks, seeds and streams, bloomings and witherings, have become numinous, as present in my imagination as in actuality. Wandering among their physical manifestations provides me with a much needed antidote to working with virtual-reality technology. They in turn appear in my work like apparitions.

Life Flow

As I began this paper, the nearby stream roared and flooded with the spring melt of a mountain's snow. Weeks later, rocks warmed in the sun and apple trees were in expectant bud. Soon after this paper goes to press, the stream will have slowed to a trickle, the forests will have leafed and faded and the apples will be ripening. Even on the most tranquil of days, a powerful force pours through here, through every element and creature.

This river of life and time, the inexorable force that pours through all things, is what concerns me. As Dylan Thomas wrote:

The force that through the green fuse drives the flower, Drives my green age; that blasts the roots of trees Is my destroyer. And I am dumb to tell the crooked rose My youth is bent with by the same wintry fever. [3]

According to Heidegger, the Greeks called this flow 'physis':

In truth, physis means, outside of all specific connotations of mountains, sea or animals, the pure blooming in the power of which all that appears and thus 'is'. [4]

The very immateriality, temporality and apparent three-dimensionality of Immersive virtual space is well suited for manifesting such a concept. In Ephémère, besides the various comings-into-being, lingerings and passings-away and the transformations of illumination and spatial contexts, there are 'flows' of rivers, root flows and body fluids streaming through the work.

Poetic Body

Ephémère, like Osmose, utilises an embodying user interface in the form of a vest that tracks the participant's breath and balance, enabling him to move through the work by breathing. A head mount is used for real-time display of stereoscopic 3D computer graphics and 3D localised sound. This device is also used to evoke a sense of spatial envelopment.

This strategy serves to implicate the immersant within the space and grounds the work in interior processes of the physical body. [5]

In Ephémère, I have incorporated visual and aural elements that recall the mortal fleshy body of organs, blood and bone (referring not only to human but all bodies). As the mythologist Joseph Campbell has written:

Myths and dreams ... are motivated from a single source namely the human imagination moved by the conflicting urgencies of the organs, (including the

brain) of the human body, of which the anatomy has remained pretty much the same since c. 40.000 BC. [6]

Poetic elements of the organic body function as the substrata of Ephémère, under the fecund earth and the lush bloomings and witherings of the land. The symbolic correspondence or equivalence between body and earth is key to the work, Rocks transform into organs; rivers transform into veins, and vice versa. While I cannot completely articulate the rationale behind such metaphors, they have been present in my work for many years.

Some people in the burgeoning cyberculture imagine that one day we, as a species, will escape the confines of mortal bodies by merging ourselves with silicon. In this context, Ephémère can be viewed as an attempt to reaffirm our limitations, our mortality, our dependency on ageing bodies and an earth which will, for those of us now living, absorb

Spatiotemporal Structure of Ephémère

As mentioned earlier, Ephémère is structured temporally as well as spatially and thus contains a progression of visual and aural events through realms of landscape, earth and body.

	winter	> spring	> summer	> autumn	
Landscape:	dormant	> blooming	> leafing	> falling leaves	> dust
Earth:		germinating	> fruition	> decay	>
Body:		eggs		> bones	>
	r	i	v	e	r

If an immersant stays within the landscape for an entire session it will change around him, passing through cycles of day and night, from the pale grey of winter, through spring and summer to the climax and decay of autumn. The elements in the other realms transform as well: in the earth seeds become active then fade; in the body, eggs appear and ageing organs give way to bone. While the participant may spend an entire session in one realm, it is more likely that he will pass constantly between them, immersed in transformation.

While the immersant is able to move vertically through the landscape, earth and body by breathing in or out to rise or to fall, another means is possible: the river. The river is a constant element flowing throughout the work. When gazed upon or followed for any length of time, it transforms into an underground stream or artery/vein (and vice versa) bringing in their appropriate visual/aural surroundings. Even as the participant roams among all three realms, by rising/falling or via the river's transformations, no realm remains the same, changing through time, ending in dissolution.

All the transformations which I have described are aural as well as visual. While the visuals pass through subtle changes of visibility and non-visibility, light and shadow and in the case of landscape, progress from the relatively literal to the abstract the sound is also in a state of flux. Interactive and localised in three-dimensions, it flows between melodic form and mimetic effect in a state somewhere between structure and chaos, adapting moment by moment to the changing spatiotemporal context and the immersant's behaviour.

In addition to the various transformations described above, there is another kind of transformation in which the perceptual faculties and imagination of the immersant are deeply implicated. The visual aesthetic of Ephémère, like Osmose, is based on extensive overlaying of semi-transparent three-dimensional forms, creating a constant variability of the perceptual

field, causing semiotic and sensory fluctuations which are channelled within the larger meaning of the work.

Finally, in *Ephémère*, there is a subtle inter-responsivity between selected elements and the immersed participant. These iconographic elements include germinating seeds, rocks and the river as already described. Their behaviours depend on the Immersant, responding to proximity, slow movement and/or gaze.

While the creative process associated with *Osmose* resembled the constructing of a perceptually-mesmerizing immaterial stage set, the making of *Ephémère* has been exponentially more complex, both conceptually and technically. The process has resembled the creation of a virtual opera, consisting of the development of a myriad of visual and aural elements, whose various comings and goings must be calculated in relation to each other, the progression of the work and the immersed participant, in real-time.

The Net of Life and Time

As I write, dusk has fallen and my ears are filled with the dizzying, deafening sound of shrieking frogs and crickets, creating a sensory vertigo, similar to the state of reverie which I and others have experienced in *Osmose*. [7]

This land is the muse behind *Ephémère* at this moment, a velvet envelope of mountain evening, silent rocks, flowing water, insistently budding flora and shadowy fauna stealthily engaged in the business of their own lives. Here I am immersed in an unfathomably complex, inexorable flow which pours through a myriad of channels, whose embodied forms are, as Henri Beston wrote in 1928:

Brethren...not underlings: they are other nations caught with ourselves in the net of life and time, fellow prisoners of the splendour and travail of the Earth. [8] *Ephémère* is an attempt to express all this.

These days however due to a litany of consequences of human attitudes and actions, the rich biodiversity of Nature is rapidly diminishing. On this particular piece of land, fewer songbirds return in spring to nest, frogs and salamanders have less young and the maple trees are dying. In some ways, *Ephémère* is a lament, not only for the ephemerality of our own lives, but for the passing of Nature as we have known it.

Conclusion

The construction of virtual landscapes in an age of environmental crisis is fraught with implications. All digital constructions of 'virtual reality' and cyberspace are ideologically-laden and most serve to reinforce the cultural value system which Henri Lefebvre has labelled as the 'reign of King Logos' [9]. Such constructions may also serve to distract from earthly responsibilities and the very wonder of being embodied among all this, here now. However, alternative approaches to the technology are possible. As Marshall McLuhan wrote, such usage is the responsibility of artists:

The function of the artist in correcting the unconscious bias of a given culture can be betrayed if he merely repeats the bias of a culture without readjusting it. In this sense the role of art is to create the means of perception by creating counter-environments that open the door of perception to people otherwise numbed in a non-perceivable situation.... In an age of accelerated change, the

need to perceive the environment becomes urgent. New environments reset our sensory thresholds. These in turn later affect our outlook and expectations. [10]

While our habitual perceptions may lead to the forgetting of being, the paradoxical qualities of immersion in a virtual environment if constructed so as not to reinforce conventional assumptions and behaviour can be used to open doors of perception. In this context, Ephémèreis an attempt to reaffirm our poetic and mythic need for Nature, returning attention to our fragile and fleeting existences as mortal beings embedded in a vast, multi-channelled flow of life through time,

Today the apple trees are blossoming: tomorrow the blossoms will fall back to earth.

Notes

[1] Rilke, Maria Rainer. 1922. 'The Ninth Elegy', In *The Duino Elegies* (Trans: David Young) New York: Norton and Co, 1978.

[2] Lipped, Lucy. 1997. *The Lure of the Local: Senses of Place in a Multicentered Society*. New York: The New Press, p 11

[3] Thomas, Dylan. 1937. 'The Force that through the Green Fuse', In *Collected Poems 1934-1953*. London: J.M. Dent, p13.

[4] Haar, Michael. 1993. *The Song of the Earth: Heidegger and the Grounds of the History of Being*. Bloomington. Indiana: Indiana University Press, p 8

[5] Davies, Char, 1995. 'Osmose: Notes on Being in Immersive Virtual Space', In *Digital Creativity*, Vol. 9, No. 1, 1995. London: Swets and Zeitlinger. ISSN 0957-9133. First published in the Sixth *International Symposium on Electronic Arts Conference Proceedings*, Montreal: ISEA'95
Davies, Char, 1995. 'Osmose: Notes on Being in Immersive Virtual Space', In *Digital Creativity*, Vol. 9, No. 1, 1995. London: Swets and Zeitlinger. ISSN 0957-9133. First published in the Sixth *International Symposium on Electronic Arts Conference Proceedings*, Montreal: ISEA'95

[6] Campbell, Joseph. 1988. *The Inner Reaches of Outer Space*. New York: Harper and Row, p 12.

[7] Davies. Char, 1997. 'Changing Space: VR as an Arena of Being'. In Ascott, R. (ed). 1997. *Consciousness Reframed: Art and Consciousness in the Post-biological Era*. Proceedings of the First *International CAIIA Research Conference*. Newport: University of Wales College. ISBN 1 899274 03 0. Also (in expanded Term) in Beekman, John(ed). 1998. *The Virtual Dimension: Architecture, Representation and Crash Culture*, Boston: Princeton Architectural Press.

[8] Plumwood, V. 1993. *Feminism and the Mastery of Nature*. New York: Routledge

[9] Lefebvre, Henri. 1991. *The Production of Space*, Oxford: Blackwell, p 407

[10] McLuhan, Marshall, and Parker, Harley (1969). *Through the Vanishing Point: Space in Poetry and Painting*, New York: Harper & Row, 241, 252

Ephémère was constructed with the assistance of John Harrison, virtual reality software; Georges Mauro, computer graphics; Dorota Blazszczak, sonic architectura/programming; and Rick Bidlack, sound composition/progmmming. Ephémère was co-produced by Char Davies and Softimage Inc, Ephémère is on exhibition at the National Gallery of Canada from 26 June to 6 September 1998.

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Changing Space: VR as an Arena of Being by Char Davies

The medium of "immersive virtual space" or virtual reality as it is commonly known has intriguing potential as an arena for constructing metaphors about our existential being-in-the-world, and for exploring consciousness as it is experienced subjectively and bodily, i.e. as it is felt. Such environments can provide a new kind of "space" through which our minds may float, among three-dimensionally embodied yet virtual form in a paradoxical combination of the ephemerally immaterial with what is perceived and bodily felt to be real. [1]

My work as an artist has been to explore the medium's capacity for refreshing our "ways of seeing" through the design of virtual environments unlike our usual sensibilities and habitual ways of being in the world. This desire led to the making of *Osmose* (1994-1995), an interactive fully immersive virtual environment dealing with metaphors of nature as well as text and code, and relying on extensive use of transparency, 3D localized sound, and a head-mounted display with an interface based on motion tracking of breath and balance. [2]

Since mid 1995, more than five thousand people have been immersed in *Osmose*. The responses of many participants caught us by surprise, in terms of their emotionality, including euphoria and tears of loss. In comparing these reactions with the research of psychologists on traditionally-induced altered states of consciousness, I have come to believe that "full-body immersion" in a virtual environment can potentially lead to shifts in mental awareness. [3] That this may be possible has many implications, especially in the case of my own work with its emphasis on constructing virtual landscape.

Changing Space

Forty years ago, in *The Poetics Of Space* (1969) the philosopher Gaston Bachelard examined the psychologically-transformative potential of "real" environments like the desert, the plains and the deep sea, immense spaces unlike the urban environments to which most of us are accustomed:

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. [4]

Bachelard's poetic insight into the psychological effects of "changing space" is echoed in the research of psychologists documenting the effects of traditional contemplative practices in terms of altering states of consciousness. According to Arthur Deikman in *Deautomatization and the Mystic Experience* (1990) the conditions fostered by such practices involve a de-habituating or "de-automatizing" of perceptual sensibilities, in a way similar to that suggested by Bachelard.

Deautomatization is an undoing of psychic structure permitting the experience of increased detail and sensation at the price of requiring more attention. With such attention, it is possible that deautomatization may permit the awareness of new dimensions of the total stimulus array – a process of "perceptual expansion". [6]

Deautomatization is here conceived as permitting the adult to attain a new, fresh perception of the world by freeing him from a stereotyped organization built up over the years and by allowing adult synthetic functions access to fresh materials... The general process of

deautomatization would seem of great potential usefulness whenever it is desired to break free from an old pattern in order to achieve a new experience of the same stimulus or to open to a perceptual avenue to stimuli never experienced before. [7] (*Italics mine*)

This de-habituating of perception tends to occur as a result of certain psychological conditions, such as: when the participant's attention is intensified and directed towards sensory pathways; when there is an absence of controlled, analytic thought; and when the participant's attitude is one of receptivity rather than defensiveness. [8]

Most often attained through rigorous training in age-old meditation techniques (drug-induced experiences are outside the scope of this essay), such conditions lead to an undoing of habitual perceptions - in favour of alternative sensibilities. While these may be less efficient in terms of biological or psychological survival, psychologists believe that they permit experience of aspects of reality previously ignored. The experience of these unusual sensibilities includes:

- an intense sense of "realness" as when inner stimuli become more real than objects
- transcendence of time and space
- unusual modes of perception
- feelings of undifferentiated unity or merging, i.e. a breakdown of distinctions between things, and/or self and world
- ineffability or verbal indescribability
- a profound sense of joy or euphoria
- and a paradoxical sense of being in & out of the body. [9]

Osmose: Breathing In and Letting Go

These "unusual" sensations are eerily similar to what many people claim they have experienced during immersion in Osmose. Among the responses we have gathered through written comments, correspondence and video interviews, a substantial number of participants have reported the following:

- a feeling that they had indeed been somewhere else, in another "place"
- losing track of time (a fifteen minute session was nearly always experienced as five, a thirty minute session as ten)
- heightened awareness of their own sense of being, or as one Immersant described it: "as consciousness embodied, occupying space" [10]
- a deep sense of full mind/body relaxation
- inability to speak rationally or put logical words together afterwards
- a feeling of freedom from their physical bodies and an acute awareness of them at the same time
- intense emotional feelings, including euphoria and/or an overwhelming sense of loss when the session was ending, causing some to cry and others to exclaim they were no longer afraid of dying.

In addition, we have observed a pattern of behaviour among participants during immersion. After becoming accustomed to the interface of breath and balance, most people become intent on "doing", i.e. travelling around to see as much as possible, in what appears to be an extension of everyday goal-oriented, action-based behaviour. After ten minutes or so however, most undergo a change: their facial expressions and body gestures loosen, and instead of rushing, they slow down, mesmerized by their own perceptions within the space.

In this final phase, attention seems to be directed towards the unusual sensations of floating and seeing through things in what becomes a kind of slow-motion perceptual "free-fall".

What is going on here?

Well, if these responses are anything to go by, then it appears that immersive virtual space, as evidenced by *Osmose*, can indeed be "psychically innovating" to use Bachelard's words. Why? I think the answer lies in the very nature of immersive virtual space. Here, a sense of bodily spatial envelopment, combined with virtuality and apparent three-dimensionality, as well as feelings of disembodiment with embodiment (given the use of an embodying interface), create an experiential context that is very different from the world of our habitual perceptions and behaviour.

I want stress however that this potential for shifting mental states exists only to the extent that a virtual environment is designed to be unlike our usual sensibilities. In *Osmose*, for example, the immersant can unexpectedly see through things and float through them as well. Therefore the "familiar" becomes the un-usual. This creates room for other modes of perception: instead of the mind being on auto-pilot it begins to pay attention.

Osmose: Unusual Sensibilities

Rather than representing the world as we habitually perceive it, i.e. as empty space containing solid, static, hard-edged and separate objects, with rigid distinctions between subject, object, figure and ground, in *Osmose* we used transparency and luminous particles to "de-solidify" things and dissolve spatial distinctions. When the immersant moves within the space, multiplicities of semi-transparent form as well as abstract foreground flecks combine to create perceptual ambiguity or slippages between figure and ground, near and far, inside and out. In addition, rather than relying on conventional hand-based VR interface methods such as joystick, wand, trackball, or glove - which tend to support a disembodied, distanced and controlling stance toward the world - we used an interface based on breath and balance to allow participants to simply "float", by breathing - in to rise, out to fall, and leaning to change direction. [11]

While the unusual visual aesthetic tended to engage the minds of immersants and capture their attention, the hands-off interface approach freed them from the urge to "handle" things and from habitual gravity-bound modes of interaction and navigation. Use of breath and balance also tended to relax immersants, creating a tranquil receptive state of mind similar to that achieved by contemplative practices, which may have contributed to the overall psychological effect. As well, the feelings reported by various participants were probably intensified by the solitary nature of the experience, as well as by the fact that the work was "fully immersive", i.e. its space was perceived as totally enveloping, due to our use of a wide-field-of-view head-mounted display. All these aspects of the user interface, no doubt in combination with 3D interactive sound, probably amplified the embodied nature of the experience, allowing some people to feel themselves as "consciousness embodied in space".

While the psychological effects of full-body immersion in a computer-generated virtual environment like *Osmose* have yet to be scientifically analyzed, the potential of the medium to de-habituate our sensibilities to allow for a re-sensitization of the perception of being is worth further exploration.

Implications

Not to be forgotten however is the possibility of the medium's potency being used to replace bodily experiences of the "real" with phantasms of virtual utopias, and even for such purposes as compensating/adapting individuals to a less and less "friendly" living environment. In her preface to *Rethinking Technologies* (1993), Verona Conley writes about our loss of "humanness" in the wake of "a becoming technological of the world". [12]

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? ...

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? [13]

This question aptly applies to the medium of immersive virtual space. For unlike Bachelard's desert or ocean, Deikman's meditation cell or an Isolation tank as means of inducing altered states of consciousness, VR is a communicative medium, one which not only allows for the expression of poetic/artistic "visions", but one which also tends, by default, to carry conventional cultural values of the western techno-scientific worldview from which the technology has sprung.

The beginnings of an answer to Conley's question may have been formulated by Martin Heidegger more than fifty years ago in *The Question Concerning Technology* (1977). As an alternative to what he called technology's tendency to function as an instrument of domination and control, Heidegger pointed to an earlier form of "techne" called "poiesis" by the Greeks, associated not with "challenging" but with an artistic "bringing-forth" or "revealing" into presence, somewhat equivalent to what the Greeks called "physis" or nature's own bursting forth of being. I find inspiration here in terms of the use of Immersive virtual space as a medium for "bringing forth" or manifesting abstract ideas into the realm of virtual "place" so that that they can be kinesthetically, bodily lived.

However, even while this might prove to be a promising use of the medium, there remains a significantly disheartening aspect to my work. For even as "spaces" like *Osmose* may one day be accessible online as virtual sites of contemplation, so too such sites may signal the final demise of traditional places of self-reflection and tranquillity, particularly in terms of seeking out "nature" as we know it, as, compromised in body and habitat by human activities, its unfathomable presences recede further and further from our daily lives. My own practice in the field of "virtual reality" thus contains a bittersweet aspect, entangled in feelings of both longing and loss.

This paper was presented in abridged form at *Consciousness Reframed 1997*, 1st CAIA Research Conference, Centre for Advanced Inquiry in the Interactive Arts, University of Wales College, Newport, Wales. It is partially based on an unpublished presentation delivered at *Siggraph'96*, entitled "*Soul in the Machine: Osmose – The Paradox of Being in Immersive Virtual Space*". (Panel: Soul of the Machine, Spirituality in Cyberspace) SIGGRAPH '96, New Orleans.

NOTES

[1] This paper was presented in abridged form at Consciousness Reframed 1997, 1st CAIA Research Conference, Centre for Advanced Inquiry in the Interactive Arts, University of Wales College, Newport, Wales. It is partially based on an unpublished presentation delivered at Siggraph '96, entitled "Soul in the Machine: Osmose – The Paradox of Being in Immersive Virtual Space." (Panel: Soul of the Machine, Spirituality in Cyberspace) SIGGRAPH '96, New Orleans.

[2] Osmose was designed as an alternative to the dominant aesthetic and interactive sensibility of VR. The work was created by myself, John Harrison and Georges Mauro with sound by Rick Bidlack and Dorota Blaszczyk. It was produced by Softimage between 1994 and 1995. During public installations, the fifteen minute immersive sessions take place within an enclosed area, due to the solitary and intimate nature of the experience. There is also live video projection with sound enabling visitors to witness others' immersive journeys as they take place. A shadow-silhouette of the "immersant" is cast upon a large translucent screen alongside the video projection to draw an associative link between the body, as conduit of lived experience, and consequent imagery and sound. For a more detailed description of our intentions and methodology, see my 1995 paper Osmose: Notes on Being In Immersive Virtual Space in ISEA'95 Conference Proceedings, (Montreal: ISEA'95), and the 1996 paper co-authored by myself and John Harrison, Osmose - Towards Broadening the Aesthetics of Virtual Reality, in ACM Computer Graphics (Volume 30, Number 4) ACM Publications.

[3] By "immersion" or "immersive virtual space" I mean immersion in a 360-degree spherically-enveloping virtual environment, in my opinion possible at the present time only through use of HMDs (head-mounted displays) with wide fields of view. While less cumbersome techniques are under development, current alternatives such as wrap-around screens or domes (now known as Spatially Immersive Displays) are not as effective in achieving a sense of envelopment. My comments in this paper refer to full-body immersion through use of HMDs.

[4] Gaston Bachelard. *The Poetics of Space*. (Boston: Beacon Press, 1966) p. 206. For Bachelard's discussion on the psychologically transforming qualities of immense open spaces such as the sea, desert and plains, see p. 203-210.

[5] Arthur Deikman. *De-automatization and Mystical Experience*. In *Altered States of Consciousness*. Charles Tart, ed. (New York: Harper Collins, 1990) p.50. Note that in terms of "receptivity" to Osmose, I have been told by at least one individual that although she was intellectually skeptical when she went in, "something happened" and much to her surprise she became entranced. This points to the medium's potency, for better and worse.

[6] *Ibid.*, p. 47-55.

[7] *Ibid.*, p. 52.

[8] Arthur Deikman. *Experimental Meditation*. In *Altered States of Consciousness*. Charles Tart, ed. (New York: Harper Collins, 1990) p. 262-263.

[9] Private correspondence, September 1995.

[10] This method was partially informed by my own practice of deep scuba diving in oceanic space, a psychically innovating space as Bachelard suggested, where one can be sensuously,

buoyantly enveloped in an almost pure blue space, where the horizontal axis is not privileged, and use of probing hands is discouraged.

[11] Verona Andermatt Conley. 1993. Preface. In *Re-Thinking Technologies*. Verona Andermatt Conley, ed. (Minnesota: U. of Minnesota Press, 1993) p. ix.

[12] *Ibid.*, p. xii.

[13] Martin Heidegger. *The Question Concerning Technology*. In *The Question Concerning Technology & Other Essays*. (New York: Harper, 1977) p. 10-14. For a discussion on Osmose and Heidegger and the dangers of this medium, see Laurie McRobert. *Immersive Art & the Essence of Technology*. In *Explorations: Journal for Adventurous Thought*, (Autumn 1996, Vol. 15, #1).