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**Consciousness, Art and Media -
Reflections on Mediated Experience**

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There are a number of art historians who separate the history of art from the history of technology strictly. Herbert Read e.g. is one of them. In his book *'Icon and Idea - The Function of Art in the Development of Human Consciousness'* he suggests to interpret art as a materialization of consciousness - based on the platonic concept of beauty and harmony. He claims that mankind perceives e.g. symmetry because it is an integral of the human body - this moment in history he calls *'consciousness of symmetry'* - after which artists can make the *'conscious use of symmetry'*. His example for this early stage of a materialized consciousness is paleolithic sculpture. The next step in the materialization of consciousness, according to Read, is the addition of *'a third dimension, of space in depth.'* Read claims that *'all the laws of geometrical composition were first made evident in art; the first science was a notation of the discoveries of the artist; mathematics arose as a notation on artifacts.'*

I am intrigued by Read's suggestion that art is a *'materialization of consciousness'* but I want to oppose his separation of the history of art from the history of technology and rather suggest the contrary: that art history can be read as media history - claiming that architecture, painting, sculpture are media as music and language and computers are.

The decision, to start my talk with a negative result is based in the interdisciplinarity of the workshop. My background in classical art history and aesthetics and my research during recent years within the field of what I use to call *'electronic art'* brought me to a point where I need to reconfigure the main stream definition or idea of *'art'*. To mediate this experience to you, I will try to perform the effect of Read's assumption on the interpretation of a recent art work which was produced two years ago. An art historical attempt to analyse this work without accepting the compatibility of art and technology would look as follows:

My paper is based on the art work 'Osmose', a virtual reality installation created and developed by a team headed by Charlotte Davies, including John Harrison for the

virtual reality software, Georges Mauro for the graphics, Rick Bidlack for the music, and Dorota Blaszcak for the design and sound programming. 'Osmose' is an immersive virtual space, based on virtual reality technology, where goggles provide visuals, and a device dependant on breathing navigates the user through the space. The work was shown for the first time in 1995 in Montréal at the 6th International Symposium on Electronic Arts (ISEA 95).

Char Davies, the artist, the concept of the art work

I could describe the artist and her background and mention that Char Davies has absolved a classical education as a painter. Her interest in photorealism led her to the insight that painting as a medium could not perform her contemporary needs. Being involved in the development of software for moving images, she helped establish one of the most known software companies (Softimage) that merged with Microsoft in 1994.

Looking at her paintings, I could describe them as photorealistic with a growing interest in a complexity of light reflections and shadows of objects onto object surfaces that fragment the objects in a cubistic way. Focussing more and more on light effects and not on the solidity of the objects or surfaces, her last paintings remember of early impressionistic paintings such as those by William Turner.

I could bring up more biographical information about Char Davies' experiences with scuba diving, that led to the development of an interface that allowed her to enter the visual world she had in her mind. If I would do this, I would prove the correctness of my results with citations such as:

It was the first time in my life that I entered a space where there was nothing to see, no separations between inside and outside. If you saw a little tiny speck, you didn't know whether it was the glint in a barracuda's eye, or a little jellyfish, or a misfiring of a rod in your retina. I guess I started accessing endorphins or something, because I really got into a trance. (Eric Davies' Article)

For Davies, Osmose is trying to create an environment of being still and just being - allowing things to come to you - rather than always doing, getting, conquering and moving forward. That stasis is so antithetical to our culture of doing. (Francis Dyson's Article)

*Philosophically, Davies says, Osmose is about *being-in-the-world* in its most profound sense. It's about our subjective experience as sentient, embodied, incarnate, living beings embedded in enveloping, flowing space.* (Margaret Wertheim's Article)

... filled with passages from philosophical works that have inspired Davies. Selections from Heidegger, Rilke, Huxley, Joseph Campbell, and Gaston Bachelard explore issues of nature, the body, and technology itself. Interspersed with these texts are some of Davies' own writings about Osmose. (Margaret Wertheim's Article)

Above all, by 'reminding people of the extraordinariness of simply being alive in the world', Davies hopes that Osmose and its successor can act as 'arenas in which we can perhaps relearn how to 'be'. (Margaret Wertheim's Article)

This chapter would enlighten the *concept* of the art work *Osmose*.

John Harrison, programmer of Osmose, the making of the art work

I would have to continue this analysis by describing the making or the production of the concept, or the idea. So I would have to talk about John Harrison, the person who developed the necessary software which is an invention in itself because of the visualization of transparency in a real time environment. I could talk about his background and his experiences of being a programmer at the Banff Center, near Seattle where he started to program within an art context. I could continue examining the works he has already realised and compare the aesthetics within these works and look for similarities although the *artistic partners* were different ones, I could start to ask for his personal style in programming and so on and so on.

Much more interesting is the cooperation between Char Davies and John Harrison. In untaped interviews that I recall from memory here, he told me that the early paintings of Char were one tool of visual communication between them.

Programming VR software means that I had to imagine the negative of what the 'immersant' is getting as visual inputs. While I was working on that, I remembered a short story by Ursula LeGuinn, in which a tree is telling the story of its life. The tree is the fix point in the story in form of the story teller, in a similar way, the program has to act like this: wherever the 'immersant' is heading to, the program has to create the counter part that is moving towards the position of the immersant, not the other way around. Although the immersant of course gets the illusion to move forwards actively. (untaped interview between John Harrison and Susanne Ackers during the exhibition of *Osmose* in Newcastle upon Tyne, November 1996)

The imagery of Osmose, the visual content described in works of literature, the art work

Another methodological tool is to focus on the reception of an art work. This method has its roots within disciplines that are based in literature studies.

*The first image the immersant discovers is a kind of large clearing where a stream flows and in the center sits a hieratic tree with bare branches. When one comes closer and enters into the tangling of its branches, there appears a dense foliage that will disappear from the eyes of the spectator going away. The space of the forest around is a dense underwood inviting one to get lost. The spectator can also get closer to the stream, crossed by little lights which turned out to be fish-fireflies constituted by several dot of light like constellations. By sinking into the water, different life forms manifest themselves and it is possible to slip into other contiguous spaces like the one of computer code which is in fact the scripts of the Osmose application. At the far end of the dive, a huge waving bubble appears, welcoming a visit. In penetrating it, the spectator finds him or herself back in the beginning scene with the tree and the stream looping the universe on itself. All the spaces show a high formal coherence,

playing with transparencies and blue-gray tones. The semi-darkness, shadowy light, and lonely ambiance have a very strong poetic power and the desire for dreamily strolling never gives out in one session.* (Florent Aziosmanoff's Article)

This would have to be the end of my analysis if I would deny a merging between technology and art in such a dogmatic way as not only Read is suggesting it.

What I did until now, was to describe the art work in a traditional way: the artist and her concept of the art work, the programmer and the production of the art work and the immersant and his reception or perception of the art work.

I will show now a 14 minutes documentation video tape produced by Char Davies and her team, revealing the unification of technology and *art*.

I would like to use this talk to present two versions of art history to you: 1) The history of two dimensional visuals using perspectival laws to create three dimensional spaces on two dimensional surfaces is a short one - it started around 1500 and broke within the context of art from 1800 onwards but has been continued until today through the invention and widespread use of photography, film and TV. 2) The history of the different media that were combined at different times into art works, e.g. gothic architecture - and the fact that it was relations between numbers that created the aesthetical bridge between the different media.

My thesis here in this workshop (and I am stressing this because I will be drifting into fields that do not provide me with a solid ground knowledge, so I am asking for guidance by the specialists) on consciousness is that the history of art could be read as a history that merged the two abstract systems of communication - mathematics and philosophy - into materialized products that are mediating knowledge.

A Short History of Visual Art

Perspective as Symbolic Form

In his article 'Perspective as Symbolic Form' Erwin Panofsky (1892-1968) reconstructs the interpretation of greek sources on the subject of perspective in the Renaissance, proving that the revival of Euclid's publication 'Optica' was not done without contemporary adjustments.

Euclid had differentiated the subject of perspective into 'perspectiva naturalis' and 'perspectiva artificialis'. In other words, Euclid was aware of the difference between the perception of the human eye with it's concave background serving as a projection screen and the 'artificial' effort to project this impression onto a two dimensional surface. While the Greek mathematician respected this contradiction, his Renaissance translators and interpretators did not. Panofsky gives several examples in which this, Euclid's 8th theorem, was either incorrectly translated or completely neglected.

The projection onto a two-dimensional surface is an abstract procedure and it can be seen as a loss of the psychophysiological space (1), but Panofsky points out that

instead the loss was balanced by a bondage between bodies and space. Distances became measurable and through the tool 'perspective' visualizable.

The use of 'Perspective as Symbolic Form' or PASF did not only influence the history of art but also the history of visualization for scientific purposes. Along with the emerging natural sciences such as botanics and mineralogy, astronomy and geology, scientists were eager to visualize their objects and results. Plants and stones - being objects that did not move - were easy to visualize. These objects were static, with clear outlines and could be drawn in what is later known as an objective, scientific way.

The objects of interest for artists and scientists changed throughout time: from a plant and a stone, to astronomical objects like the moon, to geological phenomena such as erupting volcanos, to products of the early industrial age such as steam trains. We notice a rising perception and production of velocity. And, to mention it explicitly, until the middle of the 19th century, all these objects were represented visually with the use of PASF and a flat surface.

The breakdown of Perspective as Symbolic Form or PASF

As scientists became more acute in their observations of natural processes, a new system of visualization became necessary. It is no wonder then, that photography, also based on the principles of PASF became an important medium for scientific observation and documentation.

At the end of the 18th century, PASF split into two factions and within the context of art, lost much of its power. If scientists paid artists to produce visuals of the Vesuvius in a way that would serve an objective documentation, what would happen to the artistic process of visualizing this sublime performance of nature?

'Impressionism' can be described as a creative field of experimenting with the denial of the rules of 'perspectiva artificialis'. Above all, it was the genre of landscape painting that allowed to develop new painterly approaches during the 19th century. Instead of the focussed central perspective, or PASF, multiple view points served as a pattern for visualization. But nevertheless, the medium of painting is still static and the viewer is fixed in front of the painting. In other words, viewers still have to visit the Tate Gallery in London and position themselves in front of a two-dimensional surface.

Joseph Mallord William Turner (1775-1851) painted light effects and avoided linear outlines and perspective laws. In his paintings, time as a process becomes an authorized subject of painting allowing him to represent a moving train in a static medium.

As such, the visual aesthetics of 'Osmose' which offer multiple viewpoints can be understood within a continuing tradition of visual art. The two-dimensional static surface has changed into a two-dimensional projection screen that generates picture elements. Taking into account the restrictions of the human eye, the velocity of the picture is not being perceived consciously. Instead, 'Osmose' takes into account the perception of individual time.

Examples of real time experiences in literature

Literature was the medium to provide experiences of individual time but not in real time. 24 hours in the life of the reader are not 24 hours in the life of let's say James Joyce's Ulysses. Without being competent enough to interpret the following two text passages, I nevertheless would like to read them to you and claim that there have been developments in the area of literature that sort of prepared 'real time experiences' of the sort they are visualized in 'Osmose'.

My first example is taken from a short story by Ursula Le Guin from 1975, the second example is a passage from Carlos Castaneda's conversations with Don Juan from 1972.

We watched the tiny lights come and go around us, and doing so, we gained a sense of space and of direction - near and far, at least, and higher and lower. It was that sense of space that allowed us to become aware of the currents. Space was no longer entirely still around us, suppressed by the enormous pressure of its own weight. Very dimly we were aware that the cold darkness moved, slowly, softly, pressing against us a little for a long time, then ceasing, in a vast oscillation. The empty darkness flowed slowly along our unmoving unseen bodies; along them, past them; perhaps through them; we could not tell.

Where did they come from, those dim, slow, vast tides? What pressure or attraction stirred the depths to these slow drifting movements? We could not understand that; we could only feel their touch against us, but in straining our sense to guess their origin or end, we became aware of something else: something out there in the darkness of the great currents: sounds. We listened. We heard. So our sense of space sharpened and localised to a sense of place. For sound is local, as sight is not. (Le Guin 1975)

I tried to focus my gaze on the water but its movement distracted me. My mind and my eyes began to wander onto other features of the immediate surroundings. [...] Finally I noticed that my mind and my eyes were focusing on the water; in spite of its movement I was becoming immersed in my view of its liquidness. The water became slightly different. It seemed to be heavier and uniformly grayish green. I could notice the ripples it made as it moved. The ripples were extremely sharp. And then, suddenly, I had the sensation that I was not looking at a mass of moving water but at a picture of water; what I had in front of my eyes was a frozen segment of the running water. The ripples were immobile. I could look at every one of them. Then they began to acquire a green phosphorescence and a sort of green fog oozed out of them. The fog expanded in ripples and as it moved, its greenness became more brilliant until it was a dazzling radiance that covered everything. [...]

I became immersed in the mist again and noticed that it was not fog at all, or at least it was not what I conceive fog to be like. The foglike phenomenon was composed of tiny bubbles, round objects that came into my field of 'vision' and moved out of it with a floating quality. I watched their

movement for a while, then a loud, distant noise jolted my attention and I lost my capacity to focus and could no longer perceive the tiny bubbles. All I was aware of then was a green, amorphous, foglike glow. I heard the loud noise again and the jolt it gave dispelled the fog at once and I found myself looking at the water of the irrigation ditch. Then I heard it again much closer; it was don Juan*s voice. (Castaneda 1972: 163f.)

Within the last decades of our century, developments such as land art, performance art, concept art, and video installations have been developed - all of which urge the viewer or visitor to move in space. The motion of the participant consequently touches more than the visual sense within the viewer.

Perception of Individual Time in 'Osmose'

In many ways, the jump from the use of perspective in painting to impressionistic techniques is comparable to the leap made by the techniques of the visuals in Osmose. The visuals in Osmose are created by algorithms. As such, they are no longer dependent on visual images that are taken from real life such as photography or film, but rather are generated by the computer. While the visuals do not continue the PASF tradition, they do continue the concurrent PIT form - realized through the cooperation of specialists in the different fields.

Indeed, the virtual reality environment stands as a technological development within the scientific line of PASF and thus is not a simulation of 'perspectiva naturalis' but rather a continuation of 'perspectiva artificialis'. VR technology which was developed for architectural and engineering simulations serves as a mirror of what visual reality looks like after a history of 500 years of PASF - and in its recent use for big investment architecture such as the Potsdamer Platz in Berlin, they even invade our actual space and materialize in every-day-life.

To my knowledge, *Osmose* is the first work based on virtual reality technology, which offers a visual aesthetic that contrasts the cartesian grid that is visible in the very beginning and that is used to focus the immersants sight individually. I am not saying, that *Osmose* is negating the tradition of PASF, but it is irritating the immersant through the difference in visuals that lead off the usual paths in VR or in the urban spaces of western civilization. (2)

Since the 1960ies, most concept art or installation art created or used spaces that the viewer enters with his/her body, with VR technology the spaces are only created and perceived by the immersant through visual and audio input. This is accomplished through the use of screens attached to the eyes of the viewer. In this respect, the process of visual perception has not changed.

What has changed then, is the fact that the viewer's visual position within the constructed space has been detached from it's fixed position. Although in reality, the body of the viewer is not moving outside of a radius of half a meter, (s)he is travelling through a larger immersive virtual space - perceiving movement visually.

As long as the position of the viewer was or is fixed in front of a painting, a photography, or a film screen, we can speak of a fore-, middle-, and background - even describe the deconstruction of these forms. In an immersive space like *Osmose*, these descriptions are inappropriate. The viewer moves within a complex space which is nothing more or less than moving points of light created by a programme generating algorithms. The points of light are in motion because the immersant responds to his/her perceptions.

In Osmose, 'perspective' is perceivable as individual time. A constant need for (re)positioning within the dimensions of 'time and space' creates an aesthetic experience which irritates our common sense ideas of space and time, ideas that are (still) influenced and shaped by PASF through photography and film. The viewer is immersed in Osmose and spends his/her own 'real time'. Through the interface (s)he responds in an intuitive way - reacting to visual and acoustic input. There are no concrete objects, no defined boundaries, no visuals that are drawn from the tradition of PASF. Our trained patterns of orientation which take us along a wall, towards defined places are no longer useable. Apart from reconfiguring our perception of space and time, the parameters of light and velocity in Osmose are the only means to relate to. Even without any active input other than breathing, the immersant sinks down through the worlds of Osmose - experiencing time passing by.

The introduction of Perception of Individual Time or PIT

Before painting gained priority in art history in the early 15th century, we find a conglomeration of different media that offered unique experiences for contemporaries. The correspondance of proportions within music and architecture in gothic churches is a recent field of research, based e.g. on the reasearch of acoustic reverberation and the composition of music for certain architecture.

The use of mathematical knowledge within architecture and music is based on the medieval educational structure which is known under the name of the Seven Liberal Arts. While the trivium: rethorics, dialectics and grammar were based on language, the quadrivium: music, geometry, arithmethics and astronomy can be summarized under the reign of numbers. It is this complex interaction that was made perceivable in a gothic cathedral. The 'artist' had the knowledge about numbers and sciences, the 'craftsmen' developed practical skills that would turn theory into reality.

Can an aesthetic experience be explained by relating it back to the use of proportions? If aesthetics is the science that describes patterns of 'art works' and if we consider the dome of Florence and the Motet by Dufay as art works, can we then understand the experience of both (sitting in the cathedral and listening to music) as an art work in and of itself?

Closing the circle back to Herbert Read*s suggestion that consciousness materializes in art, has a contemporary form of consciousness materialized in *Osmose*? What exactly is its materialization? The digital programming? The digital visuals? What about the hardware and the interface? What about the real time experience of the immersant and the activities within his brain while being immersed? Is *Osmose* an art work?

What is its content? Maybe a materialization of consciousness itself - as it was defined by William James in 1884?

*The theory that time is a flux and not a sum of discrete units is linked with the theory that human consciousness is a stream and not a conglomeration of separate faculties or ideas. The first reference to the mind as a "stream of thought" appears in an essay by William James in 1884, which criticized David Hume`s view of the mind as an "agglutination in various shapes of separate entities called ideas" and Johann Herbart`s representation of it as the result of "mutual repugnancies of separate entities called Vorstellungen. [...]"

In 1890 James repeated these arguments in a popular textbook of psychology and added a formulation that subsequently became famous. "Consciousness does not appear to itself chopped up in bits. Such words as 'chain' or 'train' do not describe it fitly... It is nothing jointed; it flows. A 'river' or a 'stream' are the metaphors by which it is most naturally described. In talking of it hereafter, let us call it the stream of thought, of consciousness.* (quoted in Kern 1983:24)

Notes

(1) Panofsky (1927) is relating to Ernst Cassirer`s *Philosophie der symbolischen Formen*.

(2) Margarete Wertheim is currently working on a cultural history of space. In this upcoming publication, *Osmose* will be discussed. Her recent book *Pythagoras' Trousers. God, Physics, and the Gender Wars (1997)* throws an inspiring light on 2500 years of the history of physics and its compatibility to the history of catholicism.

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