Consciousness Reframed '97

Perception of Individual Time -

Another Version of Virtu(e)al Vision?

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Based on the article 'Perspective as Symbolic Form' (1927) by Erwin Panofsky, the paper focusses on the correlation between art and mathematics in the context of the Liberal Arts. The concept of 'Perspective as Symbolic Form' failed around 1800 when an increasing interest in nature as an object of scientific inquiry lead to changes in the way that nature was represented in art. In Char Davies' immersive environment 'Osmose'(1995), 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 the immersant's common sense ideas of the Kantian categories.

Liberal Arts, Perspective, Immanuel Kant, Erwin Panofsky, Charlotte Davies

My paper is based on the work 'Osmose', a virtual reality installation created and developed by Charlotte Davies and her team, John Harrison for the virtual reality software, Georges Mauro for the graphics, Rick Bidlack for the music, and Dorota Blaszczak 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).

The creation of Perspective as Symbolic Form or PASF

In his article 'Perspective as Symbolic Form,' (1) 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, 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 was later known as an objective, scientific way.

Moving objects such as astronomical objects were also visualized without any bigger problems - their movements were slow enough to perceive and visualize them as static objects. For instance, the water colour sketches by Galileo Galilei (1564-1642) show six phases of the moon (1616). Galileo used different phases to visualize the movement of his object or in other words its changing visual appearance in time.

The breakdown of Perspective as Symbolic Form or PASF

One hundred years later, in the middle of the 18th century, the earth itself gained more and more interest among natural scientists, especially the puzzle of its genesis. The main objects of interest were volcanoes. While during the earlier history of natural sciences, the objects of interest were small enough to be taken home, or sketched and filed away, a volcano was different. The scientists had to go to the place and observe their object for a longer duration of time. One of those was William Hamilton who observed an erupting volcano for a time period of more than 20 years. (2)

Officially, William Hamilton was a political envoy of Great Britain and a corresponding member of the Royal Society in London. Based in Naples from 1764, he followed the geological dispute between Neptunists and Volcanists. His results helped to prove the connection between the eruptions and a reservoir of hot fluid lava within the earth. Besides several visits and lectures in London, he sent five letters with detailed descriptions of eruptions, sounds, and earthquakes which he observed of Mount Vesuvius and its surroundings. One of these letters contains a time sequence: eight states of the cone of Mount Vesuvius. Though in 1772, these drawings may have been able to capture the sequences of events in a satisfying way, as scientists became more acute in their observations of natural processes, a new system 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. Instead of the focussed central perspective, or PASF, multiple view points served as patterns 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.

The comeback of Perspective as Symbolic Form or PASF

After the breakdown of PASF within art, its influence in other areas such as philosophy and natural sciences grew. In this context, I would like to refer to Margaret Wertheim's inspiring recent publication 'Pythagoras Trousers' which throws a new light onto the history of physics. (3)

Immanuel Kant (1724-1804) was not a philosopher in the first place, but a professor of physics and mathematics. His definitions of subject and object (re)established the solidity of objects which they were about to loose in the context of natural sciences and visualization. Kant went back in history, to Isaac Newton, and re-adjusted the original theory in such a way as to make it acceptible for another 100 years. Kant opposed the dogma of 'empirical science' by stating that everything a human being perceives is already shaped by 'ideas' which are established by philosophers through language. This theoretical comeback was followed and stressed by the technical invention of photography and film. As the same rules of Renaissance 'perspectiva artificialis' are used to produce a photo or a film, PASF kept influencing our 'peculiar stabilizing tendency within our consciousness', to cite Erwin Panofsky - and it is still influencing us today.

Kant's philosophical definition is based on the duality of object and subject. After 100 years of phenomenological philosophy and psychology, as well as new insights into physics and mathematics, our understanding of subjectivity is broken. Intact however, are the tools for representing reality which still dominate the patterns of our perception.

Albert Einstein's theory of relativity negated the absoluteness of time and space Kant had reaffirmed. Instead of space and time as absolute paradigms, the absolute size which physicists today 'believe' in, is the velocity of light.

Although Perspective as Symbolic Form or PASF lost its scientific as well as its experimental artistic importance in the beginning of our century, it still shapes today's mainstream understanding of art. Static media like painting and photography have kept their inherited importance.

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 once again, until the middle of the 19th century, all these objects were represented visually with the use of PASF and a flat surface.

The introduction of Perception of Individual Time or PIT

From the late 18th century onwards, the interests of artists moved towards the subject of time itself. 'Perception of Individual Time' or what I will call PIT shall serve as a tool to describe art works that include the motion of the viewer.

Within the last decades, media such as land art, performance, installations, and concept art 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. In most cases, the visual sense is combined with at least one other sense such as audio or tactile.

Before painting gained priority in art in the early 15th century, we find a conglomeration of different media that offered a unique experience for contemporaries. Here, I refer to the concept of a gothic cathedral. Today, we know only through scientific research that the use of proportions in architecture corresponded with proportions in music, taking into account such things as acoustic reverberation.

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.

While in the Gothic period, the main media were architecture and music, the early Renaissance brought an additional feature: visuality, using the same proportions for a two dimensional visual virtual reality. In Florence, where 'perspective' was invented by Brunelleschi, we know of the commission for a musical composition for the Consecration of the Dome of Florence, Santa Maria di Fiore, that would use the architectural proportions of the building.

Can an aesthetic experience be explained by relating it back to the use of numbers? 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?

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 algorhythms. 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.

As an alternative to this pragmatic context, I am interested in the use of VR technology in their critical, creative, and artistic forms. Accordingly, I suggest understanding the real time environment of ‘Osmose’ within the context of PIT. In this sense, it is comparable to the conscious or unconscious perception of being inside a Gothic Cathedral.

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.

In order to permit a discourse about works such as ‘Osmose’, a specific methodology for discussing visuals is needed. While most concept art or installation art creates or uses spaces that the viewer enters, with VR the spaces are only created and perceived by the immersant. 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 or a film screen, we can speak of a fore-, middle-, and background. 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 algorhythms. In ‘Osmose’, the points of light are in motion because the immersant responds to his/her perceptions.

In so far as visual arts are influenced by mathematics, so too, are the theories of history bound to language. In the case of virtual reality, then, we have to accept the fact that language cannot adequately describe complicated programming. A theoretical methodology which would discuss visuals of VR technology within the continuing art historical tradition thus has necessarily to extend the boundaries to include both past discursive practices and new forms of description and analysis.

(1) Panofsky, E. 1927. Perspective as Symbolic Form. New York: Zone Books.
(2) Ackers, S. 1991. Der Vesuv. ‘Untersuchungsgegenstand der Naturforscher’ oder ‘Protagonist des schönen Schauspiels’? Eine Motivstudie zu Werken deutschsprachiger Künstler zwischen 1740 und 1850. Berlin: MA Thesis at Kunsthistorisches Institut der Freien Universität.
(3) Wertheim, M. 1997. Pythagoras’ Trousers. God, Physics, and the Gender Wars. London: Fourth Estate.

Biographical Profile
Born in 1962 in Goch, Germany. Finished her studies in Art History, Philosophy and Italian Language at the Freie Universität, Berlin in 1991. Free lanced as curator, writer, artist, and project manager in the contexts of Contemporary Art and Electronic Media. Since 1996 Senior Lecturer at the Department for Humanities, University of Skoevde, Sweden. E-mail: susanne.ackers@ihu.his.se.