VIRTUAL ARCHITECTURE

controlled fire

emanuel   dimas   de   melo   pimenta

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Thirty spokes are made one by holes in a hub

The stopped eye cannot see.

We have an amazing network of blood irrigation in front of our retinas. If we could see through our stopped eyes we would be lost in a network of shadows and colours. This would occur even with simple movement, because the network of blood irrigation is fixed in relation to the retina. Vision uses an artifice created by the brain without which we would be practically blind. Thus, our eyes almost never stop. They make small and constant scanning movements without us being aware of that.

The whole history of architecture, since the Mesopotamian world, seems to be intimately related to this fascinating capacity of subtle ocular motion – we move our eyes in a frequency of about ten times per second, imperceptibly.

Until recent times the only thing capable of stopping our eyes was fire. Because of this, magic was always related to candles and bonfires. Because of this, since the remotest times, we have used candles in mystical rituals and exercises. It is a way of stopping the eyes without us being aware of it. But fire was in its original form too ephemeral to permit us to draw directly with it. The Egyptians almost made it when they created the magnificent and subtle bas-reliefs, using the sun light, the contrast and the shadows as if they were directly operating fire, at that time dominant in several dimensions. They looked at these bas-reliefs like at beautiful drawings as if made from neon lamps. But it was, after all, projected and not emitted light.

The lamp itself never allowed a great flexibility being generally used as a medium of light projection. Electrical lamp's *controlled fire* doesn't have a frequency that substitutes the ocular work. With the phenomenon known as *scintillation* – which happens when the frequency emitted by the electric lamp goes close to ten cycles per second - the eye makes an enormous effort to follow the changes of lighting. But since the vibrations are close to the boundary of the eye's frequency spectrum, it doesn't stop its movements and is overloaded, producing a profound sensation of tiredness. Thus, even after the development of the electric lamp by Edison, fire continued to be the only medium that effectively replaced the unnoticed ocular movements…

Until the appearance of the cathode ray tube, television.

Curiously, the origin of Virtual Reality – Integral or Synthetic – seems to be based on the logical schemes of television and telephone, like the phonetic alphabet had its roots in the strategic structures of eye and ear. Only later, following its own revolution, virtual reality would be also revealed as touch with the whole complexity inherent to this.

Marshall McLuhan observed that after the dissemination of television children would read distancing their eyes only about fifteen centimetres from the written pages, as if they carried into the paper the notion of total involvement produced by that new sensorial technology.

Those who work in cinema know that the framing of films for television is much closer. That is, the filmed objects are really closer, filling more of the visual field. Films made to exhibit in cinemas are often contaminated by television showing longer scenes without cuts and more *closed* framing - dealing with what we could call a cinematographic iconography. The same seems to have happened, in a more subtle way, with the lens type used in movie cameras. After the dissemination of television, whose production didn't support *fish-eye* lenses for a long time, these turned to be considered *kitsch* and were practically restricted to terror, intense suspense or poor quality films.

One of the most curious characteristics of television is its integral quality, the production of a unified sensorial quality. Much probably because it monopolizes the process of vision, taking it from the human body and liberating the other senses. This is in some way the opposite of what happened with literary culture. Literature isolated vision from the other senses, forcing the eye to a complex and absorbent double exercise: reading *by blocks*, which is in a certain sense synchronic, and a *linear* reading, diachronic, one complementing the other. While literature compartmentalized, television integrated knowledge and disciplines.

In the early 1960's Alan Mackworth developed a specific equipment to observe the ocular movements in children, when they watch television. For the first time it became possible to perceive how the scanning made by the eyes was substituted by the sweeping made by the cathode ray tubes. Thus the eye stopped - as when admiring the fire – but kept seeing. The task of visual perception of form was transferred from the ocular movement to the television screen liberating the other senses, thus creating a hypnotic involvement.

In the same way television does not compartmentalize our idea of time and space. It also doesn't permit the profound approaches of literature. Everything happens on the surface. This occurs because we are able to memorize only about one hundred pixels per second of the millions of points printed on the screen. Also because of this television is considered a *cool* medium. That is, a medium that needs to have its voids of memory and perception filled by

our imagination. Literature makes a different thing through the distribution of letters on the paper: monopolizing the vision and annulling the other senses we directly recall the whole symbolic universe created by verbal language. It creates a repertoire constructed during our lives becoming a "hot", more complete, medium. Because of this, literature and the literary world are full of symbols and metaphors. The same doesn't happen in the case of television, which strongly operates the axes of similarity.

Similarity, or paramorphism, was the very first nature of movie – to become *content* of the first television. It's enough to recall Melies, the genial Eisenstein, Hitchcock – who made a revolution in his own cinematographic discourse using from television the long scenes without cuts. This would also be one of the essential lessons by Fritz Lang, Kevin Lynch or Wim Wenders.

On the other hand, long films specially made for television – as to remind us that Nature operates by opposition – seem to insist in the opposite way, often working with contents as if trying to *imitate* literature. And because there is no deepness in the television medium, the contents are in general superficial, banal and extremely redundant with what we could call a *thin repertoire*. The best examples of films for television, which reflect with a great skill their medium, are in the advertisement and in the video-clip groups. The enormous success of the Brazilian novels for television is another example: the absolute superficiality as basis of the television discourse. All these examples show another important point: the short time nature of television. Even in Brazilian novels the large structure is articulated by short stories transforming the whole process into a mosaic of condensed frameworks.

This is not a judgment or the establishment of any order of values; it doesn't to say this to be better than that: it's only different. Literature convinced us with its exclusive and uniform sensorial absorption that the only valid information is the one it produces. This way we also started to believe that the future would be clean, clear, uniform and standardized, as a large quantity of science fiction films showed us. Up until Ridley Scott's *Blade Runner* no other image for the future seemed to be possible.

The same way it had to compress time, television also had to *warm* its characters. Being a *cool* medium it was necessary to exaggerate their traces turning them almost into caricature like characters. The word *caricature* appears exactly from this, the Italian *caricare* that means *to exaggerate*. The English word *charge* used for *cartoons* derives from the French *charger*, which has the same meaning as *caricare*. An equivalent process can be observed after Gutenberg, since the press assumed an ever more relevant role. With the movable types press painting and mainly drawings in newspapers and magazines *warmed* their characters exaggerating them, intensifying their most evident traces.

To have an idea of how communication in television was obliged to *warm* their characters we can remind what happened in Richard Nixon's electoral campaign of 1963, when he appeared playing piano in the American televisions, or Bill Clinton playing saxophone about thirty years later. George W. Bush only had a chance against Al Gore in the 2000 elections because of his caricature like appearance. The ill-defined image of the slippery politician gave place to a very well defined and caricature like profile, sometimes unknown up to that moment.

Instead of a complex net of ideas only a single idea, clear and precise, prevails.

But when *warmed*, a *cool* medium has a worse performance than a *hot* one. Thus radio, newspapers and cinema improve their efficiency of communication with caricature, and the television improves with action and movement. In television, caricature is used to simplify things and open room for movement and light. Without movement nothing works in television.

The shallowness of television also spared the so-called First World countries of several wars or popular rebellions. With photography, a much *hotter* medium, the horrors of war revolted millions of electors and regional conflicts mobilized all emotions. With television there is a sort of numbness in face of the *cool*, incomplete and in a certain sense vague images that shock less the population. Because of this there's also a lot of violence on the television. Many contemporary children programs are more violent than the most violent literature of the past.

Television is hypnotic creating a deep engagement in the audience operated at the surface. This happens because when the television screen *absorbs* us it doesn't take more than our central vision. While central vision is sensitive to colour and texture, peripheral vision is sensitive to movement and light. We *deceive* our brain by presenting in a small area in the centre of the retina some of the important data for peripheral vision. It is also interesting to observe how here the efficiency of television is on light and movement, dominating a central region of retina.

When the eye stops, facing the television screen, all the rest disappears, exactly because the eye is stopped and what is making the movement that turns our perception of form possible is the dynamic strategy of the image produced by television.

Television's *controlled fire* reversed for the first time the use of light – before *projected*, now it becomes *emitted*.

Projected light produces a significant balance of contrast through the luminous absorption by the materials. With projected light there isn't a very *hard* lighting with precise aliases. Those who deal with photography know how this occurs. All lighted surfaces contaminate each other creating a general frame, subtly fluid, with more delicate differences of light and colour.

With emitted light the same isn't true. If with the projected light there is a luminous absorption by the surrounding materials, with the emitted light this will only happen directly on the retina, among the receptive cells in the neighbourhood of a certain sensitised spot. This phenomenon triggers the luminous sensation of a different nature. We start working the photoreceptive cells with a strategy that gives vision a nature closer to tactile sensations.

It is curious, to say the least, that such a search for the pervasiveness of image through the creation of a *controlled fire* only unveiled by television was very similar to the urge that launched the invention of the telephone. Started from a name created for a musical instrument, the telephone originally

appeared as an attempt to create a tool for deaf people, a tool to translate light into sound… With such an invention, deaf people could *listen with the eyes* and blind people could *see with the ears*!

In 1867 Melville Bell - Alexander Graham Bell's father – published a universal alphabet to which he dedicated his whole life. The book with this alphabet was entitled *The Visible Speech*. The search for a tool of such nature was typical of that epoch. Only some thirty-five years before Louis Braille had developed his famous alphabet for blind people.

The appearance of the telephone had a formidable impact in the entire so-called western world. Since Gutenberg all communication media were omnidirectional, *one-way*. I say *since Gutenberg* because even theatre, that before had a much more interactive nature, was defined by a strong *one-way* nature through the spreading of the *Italian stage*.

Music in medieval monasteries was like a collective work, a kind of common prayer, so clearly showed in Cluny's and Clarvaux's histories. The troubadours and countryside dancers that worked anonymously integrating populations became folklore, expression created from the sum of the English words *folk* and *lore*, respectively *people* and *wisdom* or *knowledge*. That is, *knowledge* was placed out of the cities like the word *people* became understood as *countryman*. Rural world was gradually substituted by the urban, literate and mechanical world. Newspapers, magazines and even the radio, cinema and television are omnidirectional media. All are urban products and *urbis* is a phenomenon directly linked to vision.

Telephone was the first urban medium of communication that originally appeared with two or more directions, multidirectional. Because of this, the telephone doesn't accept *format*.

Television is all articulated with *formats*: the standard duration of time in commercial spots, the type and the distribution of news during the day and so on. The same is valid for magazines, books and newspapers or even for radio… All these media have specialized *formats*. A book is articulated through its cover, introduction, preface, index and chapters etc. – its standard *format*.

Telephone doesn't accept any *format* and it's not so strange that it never had an artwork for it, which doesn't mean that there weren't artworks that sporadically have used the telephone.

With the end of the *format* there is, also, the end of the *stereotype* – very first sign of the literature that presented the desecration of Western world. The only possible *format* for telephone is that of the access. Afterwards each one speaks and listens to it freely. But telephone has a certain levelling at a much more sensitive scale that, after all, is not strange to other media. It is the *noise*.

Colin Cherry revealed in the 1950's that *noise* is the level of interference, or redundancy, of a certain medium of communication. In fact this discovery happened during the Second World War when secret radio listening was a precious war expedient. Soon, it was discovered that depending on the level of

noise – the band frequency – people should repeat more or less some phonemes to be understood on the other side. Colin Cherry put this experience into theory, adding a vast collection of fascinating experiences and statistical data collected later.

Until now we consider curious the great difficulty that a countryman or a tribal individual has to speak at telephone for the first time. All communication media implies some learning. Thus, the simple act of watching cinema also needs training that teaches us to focus the image about one meter beyond the projection screen. If we would not do this we would not be able to apprehend the film as a type of reality, as a whole.

While television is an integrator and superficial, therefore self-evident, telephone is always potentially novel. For the blind, everything is surprise. But, showing again how Nature works on opposites, the sensation produced by the telephone is that of continuity, while the one generated by the television is of novelty.

The fusion of various inventions, mainly telephone and television, originated the virtual world. And precisely this, even if not understood by many, is the reason it was called *virtual* – a word that comes from the Latin *virtus*, which means potentiality. From such a complex technological fusion, two types of Virtual Reality emerged: one *Synthetic* and another one *Integral*.

The Synthetic Virtual Reality is the simulation of concrete three or four-dimensional images on the computer screen.

In the early 1950's Fred Waller, searching for a medium of high immersion, invented the *Cinerama*. He was attentive to the fact that the human eyes cover an area of 155 degrees in the vertical and 185 degrees in the horizontal. Soon the American Air Force hired Waller where he started developing flight simulators. The Synthetic Virtual Reality would know one of its most famous landmarks in a piece of equipment developed in the 1960's by researches from the MIT, in the United States. However profoundly inspired by Waller's ideas, they inverted the scale. Now, the large screens of the cinema were no longer aimed at the deep sensorial involvement produced by television, it was television itself, reduced and implanted in the human being like a sort of prosthesis. It was called *Head-Mounted Displays*, or simply *HMD* - two small television screens almost directly implanted on the eyes with the support of a kind of glasses. With the *HMD* a strong multidirectional communication system interacted with the human body itself, replicating in a certain sense the very first nature of the telephone.

Short-circuit; the *HMD* permitted the user to see in three dimensions, in real time, a world that until then did not exist outside computers. The user could look up, to the sides or down inside the simulated space. An astonishing thing when space flights were in many ways no more than science fiction. The hard *HMD* unchained a series of new military tools.

In this same period another line of simulations was developed, to recreate inside virtual environments military airplanes and to make, with low costs, all the complex aerodynamics tests, without risking human lives. Soon, visual simulations were gradually extended to the whole body through the use of gloves and other tools.

But, as the historical trail seems to always reserve surprises even with unexpected repetitions of events and relations, both the Synthetic and the Integral Virtual Realities knew a common *knot* of expansion.

This fascinating story starts in the end of the 1950's when the American President Eisenhower created the *Advanced Research Projects Agency*, known as *ARPA*, as a reaction of the United States to the Soviet technological development.

In that time a psycho-acoustic scientist called Joseph Carl Robnett Liklider used complex mathematical models to understand how the human hearing worked. At a certain point his mathematical models assumed such a complexity that became very difficult to deal with them. Liklider then observed that when we deal with aerodynamic equations or with fluid patterns, like viscosity, the classical processing of numerical information was no longer important, but the *modelling*.

Modelling is a new term originally used by designers of airplanes that follow Liklider's ideas. *Modelling* is the base for all process of simulation in the Synthetic Virtual Reality.

Again, a visual technology seems to emerge from acoustic approaches. The eye appears once again from the ear, like our perception of visual volume that emerged from tactile learning.

But this is not the end of the story, yet... In 1960, Liklider launched a book entitled *Man-Computer Symbiosis* where he defended, to general surprise, that «in not too many years, human brains and computing machines will be coupled together very tightly, and that resulting partnership will think as no human being has ever thought and process data in a way not approached by the information-handling machines we know today».

In 1962, Liklider was integrated in the *ARPA* cadre. He dreamed of creating an invisible and indestructible weapon. So he started coordinating an interactive program that articulated computer networks, which would be known as *ARPANET*.

In 1985, the fusion of the *ARPANET* with the *NSFNET* would mean the beginning of the *Internet*.

Liklider defended: «We want to emphasize something beyond the simple 'one-way' transfer of information: the more and more meaning of construction by the union of the mutual reinforced aspect through communication – a thing that transcends the affirmation 'now, we both know a fact that only one of us knew before'. When minds interact, new ideas emerge».

That is, all together in the fusion of the television and the telephone.

The Integral Virtual Reality would find its main reference in the Internet. Then, computer networks of networks would bring even more to evidence the emergence of a new society: the *Teleanthropos*.

Teleanthropos, term coined by René Berger, signifies the human being also made of distance giving a new dimension to the concept of *proxemy*, created by Edward T. Hall in the 1960's, projecting a *teleproxemy*.

Information and matter circulating in high velocity through the entire planet. Everything becoming total diversity. Everything as total contamination.

In opposition to what some literary minds concerned about, a planetary homogenisation did not occur. Old languages – some almost dead – were reborn. Ancient cultures had a notable valorisation.

The fear of a global homogenisation is not a privilege of the 20th century. In the 19th century, the beginning of the regional railroads generated strong protests: people feared that with the railroads the concept of region would simply disappear.

The fear of homogenisation was, in reality, the projection of the literature's nature as pattern for another medium. People feared the homogenisation because they projected the press' and writing's structure as the base of their expectations, in the same way that future, unknown, should be uniform and standard.

The contemporary *virtus* would meet some personalities who in various forms anticipated the phenomenon. Joseph Beuys' immaterial projects are full of potential and diversity - this is his very first sign. John Cage's silence is not

that in its physical sense, but it's founded on the de-articulation of old processes of thought, on the liberation of routines, on the deconstruction of the world structured in stereotypes, in symbols, in orders of value. Merce Cunningham reclaims in the body the essential foundation of dance, which becomes full potentiality in the permanent elaboration of live sculptures made by space and time. Roman Verostko operates the visual as fragments of thought. The idea-poetry by Alison Knowles. The art-process by William Anastasi, Dove Bradshaw or Jan Henle among others. The Michelangelo Pistolletto's impossible possible images; the Carlo Ciarli's lines-plans. The genial poetic of e.e.cummings.

All of them taken frequently as iconoclast thinkers.

The break of vision as a pretended single foundation for a dominant logic.

Something that in a certain sense and magically leads us back to Emanuel Kant, when he warned us saying that the transcendental imagination was the root of sensitivity, which turned the judgment, the reason, possible. A thought that would bring Charles Sanders Peirce to consider that all his ideas already could be found in Kant - metaphor giving place to paramorphosis, contiguity gradually substituted by relations of similarity.

In the early 1980s, in face of a profound transformation in how to make architecture – no longer as assemblage of symbols or the search for a standard, uniform spatial formula – I imagined the fusion of both Synthetic and Integral Virtual Realities as the essence of what I called *virtual architecture*.

But this is not about architecture *for* computers.

Contrarily to what many people – involved into a profound, romantic and lethargic nostalgia – believe to be the very first reflection of a universe imprisoned by the rigors of the number, it is in fact, the expression of the freedom of the *number quality*.

The single disciplinary specialization was relegated to the past, to the rigor of the uniform routine of the press, to the desecrated mechanic and literary world that characterized what arrived to be classified as Western world: a discrete and tight particle of civilization, isolated from the rest of the world. A *rest* of world that would be classified as *primitive*, like what it had already happened with the barbarous universe for the Greek.

Now: the planetary *virtus* unveiled by the end of the tight barriers, with the disintegration of the precise frontiers, with the emergence of a post-history in the *transdisciplinarity*, with the *transcultural* interactivity manifesting itself as a gigantic cosmic system.

There wouldn't be a better *revelation* for the *apocalypse*.

A hyper-interactive telecommunication process in *real time*.

In the same way ethics seems to reveal itself, for the first time with an amazing clarity, through aesthetics: the de-aggregation of the stable *ethos* inside reasonable tight and well defined frontiers, giving place to a world pulverized into clouds, gravitational fields, folds, pregnancies and catastrophes.

When so many, with a predicative logic, feared George Orwell's single and standard control – the dehumanisation provoked by the machine – this virtual cosmic mutation showed a world full of creativity. Memory has started to have more and more extensions. Creativity has known sensorial prosthesis. Reasoning becomes game – all gradually changing with the concept of education, changing the closed space-time character of the old universities, revealing everything as permanent and unstable contamination.

So we started to ignore the primary illiterate, quickly substituted by large contingents of functional illiterates – many times placed in the called social elite, subverting the old hierarchical order. Nowadays, a functional illiterate can be an important politician, a Chief of State or a social reference. Written culture stopped to represent the vanishing point of a whole society, and tuned to be present a little everywhere, free from the old hierarchic order.

The formation of the human being – its education – lost its sense as pure transmission and accumulation of data, mutating itself as *design* on the information – a new *Paideia*. No more stereotypes. The education ceased to know rigid *formats* and the universities abandoned, very slowly, the image of the zoo as its model: rooms, disciplines, paths and timetables following a rigid structure of closed departments.

In the same way the ancient Greeks discovered the atom as a speculative reference of the phonetic alphabet, the super strings theory unveils another logic, a new sensorial palette. Laws of Nature as laws of our way of knowing things. New types of crime, new types of knowledge, new cultures: travelling on the planet.

The ancient mechanical and literary society identified in the asymmetric time, in the illusion of contiguity and in the linear and diachronic Nature its three fundamental principles of logic articulation. Now, it's the end of the illusion of contiguity as dominant element. Time passed to be simultaneously symmetric and asymmetric – reminding the *third included* principle by Stèphane Lupasco. An aperiodic, non-linear Nature emerges.

In the same way as for the three first logical principles – the asymmetric time, the *illusion of contiguity* and the linear Nature – local causality, stereotypes and the *one-way* systems characterized the whole world of representation. Now the notion of a *non-local* causality, the discovery of a new condition of the sacred with the deconstruction of the stereotypes into a universe of multiple directions passed to be the essential conditions of our manner to perceive things.

This is the universe of the *virtual architecture*.

Virtual architecture doesn't mean to design not to be built. Neither it means to design exclusively for computers.

To design virtual architecture is a new approach of time and space - an approach that no longer allows social exclusion or any type of domination. It is closer to a world made of *nanodecisions* interconnected through coordination than to a strong hierarchic system.

It happens everywhere, and it is changing, all the time.

A thing which reminds us of Jacob Bronowsky when he defended that «in every age there is a *turning point*, a new way of seeing and asserting the coherence of the world».