The Architectonic Machine

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Introduction: Architectural Machinery

For some people Architecture is seen as the way that human kind has developed to manage and/or manipulate the space around us in order to make our lives more comfortable. Weather it is from a practical or an aesthetical point of view, what is important in the development of this work is how Architecture becomes machinery, understanding it as a media to express and manifest a political and social logic.

Locating the beginning of Modern Architecture seems like an impossible task. Nevertheless is pretty much agree by different Architectural critics like Kenneth Frampton[1], its beginning has much more to do with architects bringing into question some of the classical canons like the ones described by Vitruvius[2], as much with the Industrial Revolution and technical advances. The Industrial Revolution in the 18th century brought new technology that made possible new ways of construction.

But all this must be seen not only from the angle of the aesthetics or techniques. Modern Architecture was more a later response to ideas that were already brought from other fields. It is important for this work the relationship between ideas and its spatial and/or physical manifestation. The physical and long permanence qualities of Architecture, makes possible the reading of social ideas. Like Karl Schlögel explains with various examples, History performs not only throughout time, but also it performs in space. In his own words: *die Geschichte hat in Raum ihre Schauplätze gefunden[3]*. The space in shape of buildings or cities becomes a physical manifestation of a culture in a sort of a text where History can be read.

The fast changes Europe faced after the Industrial Revolution that took over during the late 18th and the 19th century, some new ideas for the reorganisation of society were needed to be developed. This new situation demanded reforms on different fronts. Some of them with institutional character, some other changes involved more physical aspects. A good example for both cases is the Panopticon developed by Benjamin Bentham.

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[2] Vitruvius. Ten Books on Architecture. United States. 2001

[3] Karl Schlögel, In Raum lesen wir die Zeit, Ulm, Germany 2007. P. 9

This work has as a based the analysis that Michel Foucault makes in his book *Überwachen und Strafen*[4] about Bentham`s Panopticon. He explains how this building works as a machinery to exercise vigilance upon the different social fields. The hospital, the factory, the jail, the school, the army, etc. are some of the machineries that Foucault describes in his chapter about the Panoptic. The idea is to see if these machines on the one hand as theoretical exercise and if it has left a legacy or how it connects with later architecture. On the other hand another machine will be compared to the list proposed by Foucault: The *House Machine* of Le Corbusier.

The theories developed in the beginning of the 19th century by Benjamin Bentham still nowadays, have influence the construction of penitentiaries, schools, hospitals and factories. This can be compare with the influence of Le Corbusier in the International Architecture. His impact all over the world can hardly be compare with any other architect of the 20th century, especially in housing projects. The historical context of Le Corbusier might seem very far from the one of Bentham when he developed the idea of the Panopticon as a building to reform the penitentiary system of his time. Nevertheless there are some strong connections that can be established between Le Corbusier's House Machine as a natural development and the machines proposed by the English reformer.

Is very important to understand Le Corbusier's House Machine is not only the building of the house itself, for him the house as a building that was seen as just another piece of a major living machine; the city. For him the city is a larger puzzle where streets, factories, government, housing, nature, etc. are elements that build together as an organized complete entity.

> *"Aus der Ebene der Wohnmaschine – der Stadt und des Hauses – gelangt das architektonische Werk auf die Ebene der Empfindung. Wir fühlen uns angerührt."*[5]

Despite the differences between Bentham and Le Corbusier, they had in mind different problems and situation to be solved, but in both cases they offer thru architecture and the organization and manipulation of space a technique to be applied on politics.

Since the Industrial Revolution, the housing projects became a major subject in city development. In the case of Corbusier`s plans for different cities like the ones he made for Paris, Buenos Aires, Berlin and Bogota among many others, were no exceptions of having stressed the importance of housing as a big subject in urban planning. These plans have been a major influence in later projects and urban developments that have been realized in different cities. His ideas have cross political barriers, cultural backgrounds, and architectural styles.

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[4] Michel Foucault, Discipline and Punish, Gerrmany. 1994

[5] Le Corbusier, Feststellungen zu Architektur und Städtebau. Switzerland 2001.P. 86.

Architecture was no exception to all the industrial developments and to the scientific approach towards knowledge. Is it possible that political and social ideas can through the rational use of space made by architectural elements, like geometry, light, relationship of spaces, etc. have consequences in human behaviour?

The long permanence of Architecture among us sharps the potential influence that it may have on our lifes. That`s why Bentham`s ideas translated on architectural proposal and his vision on how space can be used as machinery can possibly bring discipline upon a society together with Corbusier`s architectural developments and his intention of bringing freedom and knowledge to human kind thru Architecture is an enriching approach to further analysis as much as projects and interventions in public space.

1.The Change

The Imaginary Prisons is a series of prints made by the architect Giovanni Battista Piranesi between 1745 and 1761. In them you can see various compositions of imaginary prison spaces in a state of ruins. Huge halls are crossed by stairs and bridges. They seem to go nowhere are the centre of the image. This hall is illuminated, while the viewer seems to be covered by shadows. Different artefacts are hanging; lamps, chains, wheels, some other like catapults, pulleys, and levers are dispersing in this fragmented space. The images have as much from romantic as from disturbing. Part of that comes from the Gothic atmosphere in contrast with the destroyed and rotten elements distributed all over.

These fantastic images can help us to understand the environment of prisons around the 18th century. These prisons are the base for the reform proposes by Benjamin Bentham with his idea of the Panopticon. In words of the French philosopher Michel Foucault *"a scientific jail".*[6] In Foucault's book *Discipline and Punish*[7] there is a chapter dedicated to the Panopticon idea. He starts the chapter describing the measurements taken during the pests that attacked France in the 17th century. Foucault describes how during this period the population was obliged to stay fixed in there houses. This way of control over the population was accepted as a measurement that would save their lives. They had a register of every single inhabitant, what provides the authorities of information that helps them having control over who was sick, dying or simply missing.[8]

But further more than the actual measurements taken to control the people, here is the logic behind them and its consequences on the way space is organized what is consider most relevant in Foucault`s analysis. As a disciplinary method the house arrest was applied preventing contact between the population and by this further dispersion of the virus. The second method is the cleaning one. It consists in disinfecting each space, each object of every single house. It is true that they are two different methods, but they do work intrinsically together.

The discipline method involves a hierarchical organization of the social system. This works by leaving no gaps between each of the elements that are involved in it. The fact that there is an acceptance of this pyramidal organisation, comes from the fear of death weather it is caused by the pest, or death on the hands of the justice for breaking the rules.

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[6] Michel Foucault, Discipline and Punish. Gerrmany. 1994. P. 264.

[7] Ib.

[8] Ib, P. 252.

> *"Hinter den Disziplinarmassnahmen steckt die Angst vor den 'Ansteckungen', vor der Pest, vor den Aufständen, vor den Verbrechen, vor der Landstreicherei, vor den Desertionen, vor den Leuten, die ungeordnet auftauchen und verschwinden, leben und sterben."*[9]

Everything and everybody has its place, its own location: *"Jeder ist an seinemn Platz gebunden. Wer sich rührt, riskiert sein Leben: Ansteckung oder Bestrafung."*[10] What guaranties the system is the solid work of it. By leaving no holes in the hierarchical organization, there is the absolute control, in other words the great political dream.

This methods that work to fight against the pest will have some changes in the beginning of the 19th century. By this time the idea of subdividing the tasks in different fields that control and watch over irregularities in the social behaviour became very helpful. In order to modify whatever abnormal or not desirable habit or pattern on the behaviour, the subdivision of entities that deal with social behaviour was essential. By this the authority can reach larger and more located problematic situations. This was also possible thanks to new techniques and the multiplication of institutions in charge of measuring, controlling and improving any unwilling situation.

While distribution of power was being made by the multiplication of the institutions or in some other cases experiencing big reforms inside their work system as a result of new techniques, the actual physical space of the cities were no exception to this reforms. Many examples can be given to show how the urban fabric was adapted to the necessities of an every day more industrialized economy.

But maybe one of the most influential and radical of the plans is the one that the Baron Haussmann developed for Paris between 1835 and 1869. The Baron Haussmann was in charged of bringing Paris into modernization[11]. He not only accomplished to improved the Paris polluted water supplies, adequate sewer system, multiply the number of parks and cemeteries, building new housing and to work out the congested circulation, in other words to execute the cleaning method; but he was the one who for the first time brought political power to work hand in hand with the private sector in order to achieve the city physical improvements. The industrialization wasn't only giving the support of the modernization of the city, was also joining the new rulling powers to develop it.

Here come again the two methods seen above. The cleaning method applied on the sanitary changes, but also the over position of the big axes that cross the city from east-west and north-south

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[9] Ib., P.254.

[10] Ib., P. 251.

[11] Leonardo Benevolo, La ciudad europea. Spain, 1993, P. 180.

directions over the existent city fabric[12] and that today belong to the Parisian landscape can be considered as a visual cleaning method. The visual clearness is part of the disciplinary method too. Paris became the scenography of many revolutions after the French Revolution in 1789. The idea is first to prevent the construction of barricades on small streets during the revolts and second to allow military artillery to move all over the city when necessary.

Not only the axes that create big and wide perspectives with monuments as a central point of them, they were made to bring a feeling of order and organized the public space of Paris. The standardization of public furniture such as benches, *pissoirs*, kiosks, clocks, post-lamps, signs, etc. were part of the new arrangement.[13] The city becomes the representation of what the emerging bourgeois society of that moment is. The city is organized not only by the geometry, or by the gas lamps that provides of light during the night a more intense and safe urban life, but also by organizing the space with buildings representing the institutions of the actual power: the church, the government, the industry, the science and the culture.

Applying the other method, everything now has a given place. Mobility through bigger and more appropriate streets, the public transport provided by new machinery capable to move large amounts of people through the city; the leisure, the culture and sports have also found appropriate fields, factories and their working offices, even nature with the more and more popular botanical gardens have found its location. The subdivision of tasks and knowledge helps in this new complex world. For example the concept of urbanization by Idelfons Cerda explains how the city and its new demands consider the need of a new field in science.[14]

Bentham seems to have a disciplinary method in his background, which uses space as technique, applying rules on it to keep health and order; while an industrializing world seems to put the rules in which Le Corbusier plays. For both of them the use of spatial tools is already there to be used. The question here is how they will try to use the architectural tools to achieve a specific goal in their proposals. Also to see if they do differ from each other or on the contrary, have similarities in their methodology. For this a constant comparison between their methods and visions will be made to guide us.

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[12] Aldo Rossi, The architecture of the city New York, 1982, P. 143.

[13] Kenneth Frampton, Modern Architecture. A Critical History, Great Britain 1980, P. 25.

[14] Ib., P. 287.

2. The Machine

Until now has been defined the methods that are practice to established a new order of things in space. Next to the cleaning and the discipline method, it is important not to forget the scientific subdivision of tasks to mage and understand the complex reality that is used by Bentham and later also by Le Corbusier.[15]

> *"Das psychiatrische Asyl, die Strafanstalt, das Besserungshaus, das Erziehungsheim und zum Teil auch die Spitäler - alle diese der Kontrolle des Indivduums dienenden Instanzen funktionieren gleichermassen als Zweiteilung und Stigmatisierung (wahnsinning – nichtwahnsinning, gefährlich – harmlos, normal – anormal) sowie als zwanghfte Einstufung und disziplinierende Aufteilung."*

The Panopticon of Bentham became the physical and architectonical response to help in these new subdivisions of power and authority. The Panopticon consists actually of two buildings: the first one is a tower that looks over a ring shaped building, the second one that is around it. The circular building is subdivided in cells. The wide windows of the tower allowed vigilance to be made over the cells. Each cell occupies the whole depth of the ring building and is also open from two sides. One of the sides is open to the outside of the ring permitting the light to get in, while the other side is not only open towards to tower in the middle of the ring to allow light to come into the cell, but mainly for the person inside of it to be watched. The way it works is simple: from one point, the centre, every single point of the circumference can be seen.

This new typology of building broke the former way of prison that was based on hiding, closing, and leaving in the darkness the prisoner. His proposal consisted in whether the person inside the cell was worker, a student, a patient or a prisoner, would have the feeling of being constantly watched. In other words is the inverse of the way Greek theatre use to work. The performance happens around the view of the public and not surrounded by it. Or like from the social perspective that Foucault mentioned: "*Unsere Gesellscahft ist nicht eine des Schauspiels, sondern eine Gesellschaft der Überwachung.*"[16]

The light is a key element in Bentham`s proposalas much as it is for Le Corbusier. One of the main reasons he saw in the traditional stone construction with the structure based on the supporting walls, a system even used during the Haussmann renovation project, as wrong and contradictory was the way windows were not properly made:

> *"Durch Mauern , die als Träger für Decken dienen, Fensteröffnungen stossen – das ist in sich selbst wiederspruchvolles Verfahren; Fensteröffnungen brechen heist die Mauern*

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[15] Foucault. Discipline and Punish, Gerrmany. 1994. P. 256.

[16] Ib., P. 278.

schwächen. Es ist doch ein Unterschied zwischen der Funktion des Trages und der des Lichtesdurchlassens."[17]

But not only was the contradiction in the structural system is an argument for him to consider this not to be the right to construct modern buildings. The bad conditions and qualities of spaces like the cellar of the houses using this construction system was another key argument for him. His descriptions of the cellar recalls in some extend the images from the prisons of the 18th century:

> *"Bis zur Zeit des Eisenbetons und des Eisens hob man, wenn man ein Haus aus Stein bauen wollte, breite Gräben aus, um festen Grund für die Enrichtung des Fundaments zu finden. Aber an den Seiten der Gräben rutschte die Erde, und man musste schleugnist die Hauptmasse in der Mitte, die sich zwischen den Fundamentgräben auftürmte, wegräumen. So baute man die Keller – mittelmässig, ganz finstere oder nur schlecht beleuchtete und allgemein feuchte Räume."[18]*

Light is a very important theme in Corbusier`s work. Some of his arguments to show the advantages of using the steel and/or the concrete reinforced structure in the shape of columns or *pilotis* are to erase the walls of the facade and the structural carrying walls. He saw this as a technical advance that allowed the use of glass as closing wall or in the shape of long stripes on the facades of the buildings[19]providing interior spaces with more light.

Bentham saw in the openness of the cell the importance to watch its inhabitant, while for Le Corbusier was the use of open facades in the buildings to establish in some cases a relationship between the inner space and the nature around it, but also to almost disappear the building.

Despite of this difference in the use of glass facades, there is still a relationship in the use of geometry as a tool that allowed things to be watched.   In the case of Le Corbusier the clean and pure prisms are the best way architecture can interact in harmony with it`s natural environment:

> *"Beobachten Sie diesen ganz neuen grossartigen architectonischen Vortel: die tadellose Linie des Gebäude-Unterteils. Das Bauwerk präsentiert sich wie ein Austellungsstück in einem Schaufenster, es last sich ganz anschauen. (…) Durch dieser wunderbare Säulenhalle sehe ich die Spiegelung des Wassers, ich sehe die schöne Schiffe vorbeiziehen, ich sehe die Alpen in den einzelnen Feldern des Pfahlwerks – eingerahmt wie in einem Museum." [20]*

Le Corbusier changed not only the shape of the traditional and classical building with the new steel or reinforced concrete structure; he changed the way buildings used to work too. His *five points of*

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[17] Le Corbusier, Feststellungen zu Architektur und Städtebau. Switzerland 2001 P. 50.

[18] Ib.

[19] Ib, P. 62.

[20] Ib, P.57-66.

Architecture[21] 1) lift the building from the ground, 2) and a non structural facade. 3) Free floor plan, 4) Reinforced concrete columns (*pilotis*). 5) and the roof garden. They make from the use of the building a machine that worked under new social principles of efficiency: economy, circulation and cleanness.

Openness does not necessarily mean communication. The person in the cell is isolated from the other by the side walls. By this the possibly of contamination from other in case of viruses in hospitals, aggressions in case of mad people in mental health institutions, of fraud in exams or disorder in the classrooms in case of children. Same is for workers, prisoners, etc. Here is not about a collective of people, is about watching individuals in isolation. In Bentham`s cell its inhabitant is a provider of information and never part of a communication.

One of the biggest improvements of the Panopticon is its efficiency. In this machine the person has the feeling of being constantly watched, without necessary having someone busy with the task. The principle is simple: The authority is present in the shape of the tower, but it can't actually be seen by the incarcerated what creates the feeling of being permanently watched by the authorities. In this relationship of incarcerated and vigilant a hierarchical structure of power is established.

A hierarchical social structure happens also in by Le Corbusier visions. A good example could be his plan of Ville Contemporaine. Simon Richards mentioned in his book *Le Corbusier and the Concept of Self*, it wasn`t only about rapid communications and efficient infrastructure in his urban plans, there is also a rigid hierarchical class relationship where an objective ruling elite manages the development of a country or a city.[22]

Corbusier imagined more than ruling class, a society professionally managed by engineers and logistical experts. Insurrections were vaguely possible if the production and distribution of goods and services happen to be rationalized. Sanitary rehousing was a way of avoiding revolution, a point of view that was supported by some contemporary politicians that saw in unhygienic living conditions a proper field for Communist propaganda.

For example in his Plan Voisin (so named after sponsored by the Voisin automobile company), he attacked frontally the most conflictive areas of Paris. He did demolish these areas in his plans, what would reduce according to him locations of political unrest. Another way he managed to add more enthusiast supporters to the Voisin plan, was by promising massive profits that would come from the rising number of the population living on the same place of the demolished buildings. This

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[21] Le Corbusier *five points of Architecture* are explain by many authors and in diverse literature.

[22] Simon Richards, Le Corbusier and the Concept of Self, China, 2003, P. 29.

could be achieved with the construction of sky scrapers that with a small use of site increases the density of people living on a specific urban area.

The social structure in both cases has a big similarity too. The power and authority of the King according to Bentham is subdivided and is expressed in different forms, what gives him a bigger area of intervention. Foucault sees this as a new Anatomy of Power.[23] Here a tight network manages to leave no gap by overlapping all different elements or institutions. The example Foucault gives is the Christian school. Here not only the kid is under the tuition of teachers, also the family of the child is in some extend is under the authority of the school. The family becomes the external zone of the school. The child is the eyes of the educational machinery that looks over values and behaviours inside the other element: the family.

At the end is not relevant who exercise this function of vigilance (in England various religious groups or in France the police), but is to have the political authority represent everywhere. Here is not about the sovereignty, but about the relations of discipline.

With this structure the power filters down into the social pyramid, going from the top into the every single possible space down to the bottom. The social pyramid was for Le Corbusier unchangeable.[24] His skeletons for workers would be mixed in the urban proposals with the ones made for intellectuals and aristocrats. For him part of the social unrest was caused by obsolete concepts of luxury adopted from old fashion shapes like Henry II buffets for example. Leaving unnecessary decoration out of things and leaving them just as plain objects with the beauty provided by the material were enough.

Here is one of the moments where his architectural visions go into a more intimate level. If in Bentham discipline goes builds a tight net where no space is left, Le Corbusier's net is build in architecture and geometry. For him the cleaning method mention above is a major tool for the modern man. Whatever is just decoration and lack of function must disappear. His observations on the women clothing and the British suit expresses his perceptions of tools that make our lives easier. For him (as much as for Adolf Loos), clothing, furniture and architecture have the value of tools that allows mankind to inhabit this world.

For this reason they should just provide a service: at the office they should help to do the jobs and at home they must help to recover from the daily tasks. Industry should provide according to him solutions to personalize according to individual taste the 'basic' house furniture. An example of how

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[23] Foucault, Discipline and Punish, Gerrmany. 1994. P. 268.

[24] Le Corbusier, Feststellungen zu Architektur und Städtebau. Switzerland, 2001 P. 94.

an object should be he gives one of the most known examples, which he called himself the 'rest machine': his *Chaiselonge*.

In its very own way the proposal of taylorizing the house was leaving no holes as much as in Bentham mechanism. Their proposal in this aspect have also the quality of reaching all possible niches, leaving no gap.

There is also a plan against revolts in Bentham's Panopticon. According to Foucault the Panopticon works (whether is the factory, the school, the hospital, the jail, etc.) as a scientific laboratory of power in a way that by its own system eliminates the possibility of troubles. Even if the director of any of the institution can with one glance look over the teacher, the watchmen, the doctor and so on; he won't be the first to be affected if his workers don`t manage to be efficient in their work.

The workers under his command will be the first affected by any sort of epidemic spread or a violent revolt that could happen. The director of the institution can through the mechanism of the building, study the development of events and behaviours of people living inside of it, seeing in advance possible misbehaviours and so preventing any of the situations mentioned before.

The Panopticon helps him to knit every single of the elements of the chain. The persons involved in the structure know about this, what actually allows getting with the time deeper in the behaviour of the persons inside of the machine.[25]What Bentham and Le Corbusier do is use the spatial elements as technological tool in order to bring some authoritarian control.

It is a good moment to add another element in the development of the methodology towards the use of space. Is the scientific approach that cannot be overseen. For Bentham it is important the individual observation, a characteristic that Foucault sees related to the Zoo in the Versailles Palace, because this allows the classification and characterization to analyze the distribution of space.[26]

> *"Das Panopticon ist eine königliche Menagerie, in der das Tier durch den Menschen ersetzt ist,...es stellt die Unterschiede fest: bei den Kranken beobachten es die Symtome ...; bei den Kindern registriert es die Leistungen...; bei den Arbeitern registriert es die Fähigkeiten (...)."[27]*

On the other hand Le Corbusier's visions about architecture and city planning have in science a big source of helping tools. Simon Richards identified in Corbusier`s Purist paintings as an attempt to discover a set of formal laws which would influence the psycho-physiological perception,

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[25] Foucault, Discipline and Punish, Gerrmany. 2001 P. 263.

[26] Ib, P. 261.

[27] Ib.

standardizing emotional responses of the viewers, like for example by using primary forms and colours.[28]

Another good example of how science is applied in architecture is the Modulor. The Modulor is an anthropocentric way of measurement Le Corbusier developed trying to unify the foot-and-inch together with the metric system. The foot-and-inch is based on the human body, but he considers it too complicated while the metric system regardless its practicality and convenience is seen as inhuman.

The Modulor was created after the Second World War and was supposed to determine everything in the construction environment, but also was a way to achieve knowledge. In words of Richards': *His epistemology, then, was literally to be cast in concrete.*[29] What is finally meant to be achieved with the Modulor is that humankind does not feel absorbed and overwhelmed by the universe breaking this into more manageable pieces.

> *"Für ihn ist e seine Gewisseheit, dass der Geist sich durch die Geometrie manifestiert, dass diese Geometrie sogar eine Sprache ist, Ordnung eine Eigenschaft der Geometrie und der Mensch sich durch Ordnung manifestiert."*[30]

But there also in this scientific approach something that has been mentioned previously, the Geometry. In the Modulor the Pythagorean-Platonic tradition in which most proportional system in the Western World are based on, plays an important part.[31] It has two aspects, one is the numerical relationship (1st, 2nd, 3rd, 4th) and the Platonic geometrical figures: triangle, rectangle, square, pentagon, etc.

But Geometry can be used in a more complex way that just the physical qualities of it. In the case of the Panopticon, more than an ideal or dreamed building is its use as a political form of technology. Here a hierarchical organization is translated into a location of the body in the space. Besides Architecture and Geometry there is no other physical Instrument to perform the power in the social organizations that Bentham proposes.

The advantages of this technological development are diverse, but all of them related from the industrial point of view: economy, prevention (no waste of time and energy), the continuity of work and its automatic mechanism. These principles can be applied as mentioned before in many different fields: education, health, production, etc.

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[28] Richards, Le Corbusier and the Concept of Self, China, 2003 P. 76.

[29] Ib, P. 71.

[30] Elisabeth Blum, Le Corbusiers Wege. Wie der Zauberwerk in Gang gesetz wird, Switzerland, 2001, P. 59.

[31] Richards, Le Corbusier and the Concept of Self, China, 2003. P. 104.

> *"Der Panoptismus ist imstande, die Moral zu reformieren, die Gesundheit zu bewahren, die Ökonomie wie auf einen Felsen zu bauen, den Gordischen Knoten der Armengesetze zu entflechten anstatt zu durchhauen – und all das dank einer einfach architektonischen Idee."*[32]

The final goal of the Panopticon isn't to achieve power itself or to safe the population in case of war; is to improve the social power increasing production by developing the economy, improving education, etc.

The improvements offered in the proposal of Bentham are also shared in his architectonic projects of Corbusier. The principles of industrial efficiency and managerial theories that Frederick Winsor Taylor developed were a huge influence in Corbusier, not only because of the rationalization of production, but also for his ideas about the reformation of society and the amelioration of the urban environment.

> *"Der Taylorismus (der unbedingt menschfreundlich und keineswegs etwas Grausames ist) stellt eine Grundbedingung - und zwar fordert er, dass die Faktoren einer Arbeit constant gehalten werden müssen."*[33]

His idea of the *pilotis* embodies these principles. First he explained how the costs of the reinforced concrete or steel columns are almost nothing compared with the costs of brick carrying walls. Additional to this he argues how lifting the building from the floor with the columns would leave the ground almost intact, what allows the use of this ground as garage or in case of larger surfaces it could be use as roads, street, etc.

But the columns not only permitted a better use of the ground, occupying a very small percentage of the constructed surface; they also permitted the use of what he calls the tools of private living to create a 'House Machine'. Additional to the free ground floor and a free floor plan that were for him a major achievements, is the fact that liberating the walls from its carrying duty, allows the construction of complete glass walls. These walls according to him could be completely closed and be only used as a surface that provides of light, the air would be supply with new technology (again here the subdivision of tasks and specialization plays a major role as solution). By this he guaranties the constant temperature and humidity in the interior of the buildings. He related this achievement to Taylor premises where these two factors are essential for industrial productivity.

Another analogy between the house and the machine is the one he established subdividing the house in its spatial elements that are seen like tools of private living to developed the House Machine: the sleeping room, the closet, WC, bad, change room, etc. The free floor mention above is at this point

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[32] Foucault, Discipline and Punish, Gerrmany. 1994. P. 266.

[33] Le Corbusier, Feststellungen, zu Architektur und Städtebau. Switzerland, 2001 P. 70.

of significant relevance; because it allows the all possible relations between the private elements listed before. The spaces can have variable sorts of organisations as much as in different dimensions according to the owners demands.[34]

Le Corbusier sees the house as an industrial product. The new pre-fabric technologies makes possible to make in a factory its pieces previously: standardizing it, industrializing it, taylorizing it.[35] Serial Industrial production had a major impact in his architectural design. In *Vers une Architecture* he wrote:

> *"If we eliminate from our hearts and minds all dead concepts in regard to houses and look at the question from a critical and objective point of view, we shall arrive at the 'House Machine', the mass production house, healthy (and morally so too) and beautiful in the same way that the working tools and instruments which accompany our existence are beautiful."*[36]

The relationship he established between the house and the industry isn't only in the production of the house. The 'House Machine' is also seen as such because of the way the building works. He compares the Palace de la Concorde with the steam boat and shows how the last one has the capacity of having between 2000 and 2500 persons inside, working perfect order as a huge house. For him the human kind faces a new dimension of building. In one of his lectures called *'Èine Zelle im menschlichen Maszstab',* he explained his observations in the steam boat on his trip to Buenos Aires.

In his description of the way a steam boat works Le Corbusier describes and comment his experience as passenger in a luxurious room of 15 m2. The steam boat is full of all kind of commodities that according to him a man could expect: air conditioning, fridge, kitchen, and a heating system. Also a big and a small dining room, waiters, a washhouse, ironing room; all these together with a small infrastructure that consist of a switchboard, post office, a telegraph office. All together allows the 2000 passengers disperse in 7 to 10 floors to live together and enjoy of their privacy. Thru private corridors, the passengers can access to a big roof terrace that Corbusier compared with a Boulevard.[37]   From here the argument of how a building can work as a self sufficient and harmonious hole develops further into a larger scale becoming the city projects so

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[34] Ib, P. 53.

[35] Ib, P. 95.

[36] Frampton, Modern Architecture, A Critical History, Great Britain. 1980 P. 153.

[37] Le Corbusier, Feststellungen, zu Architektur und Städtebau. Switzerland 2001 P. 90.

well known. It is true that Le Corbusier makes a sharp difference between public and private space there is always architecture to bind them together:

> *"Der Arbeiter kommt nach Hause , er zieht seinen Sportanzug an; vor dem Haus trifft er sich mit der Gruppe oder mit dem Sportlehrer; seine Frau und seine Kinder mache es ebenso. Fussball, Tennis, Basketball, Kinderspiele in bunter Folge auf dem Boulevard ver dem Gartenzelle."*[38]

The city is the hole that binds modern life. The apartments or houses are linked with corridors to lifts or stairs in a system that grows in scale linking the inhabitants of this buildings finally to larger system. Garages are linked to streets, to high ways, etc.; the hole is seen as an organism, as one entity.

Ironically being architecture of such major importance to Le Corbusier as the physical shape that binds daily life, is for him the harmony with its environment what makes the geometrical figures of such relevance. Geometry plays as the tools that would help to create this human – nature (environment) communion:

> *"Sie sehen die Harmonie, die zwischen diesen verschiedenen Elementen herrscht. Harmonie – das heist Verschwandschaft: eine Enheit. Nicht Einformigkeit – im Gegenteil: Kontrast. Aber in eine mathematische Einheit. Und auf diesem Grund ist das Kapitol ein Meisterwerk."*[39]

Bentham seem to share this approach. In his Panopticon a scheme is reproduces no matter in which field it is used. It is seen as an instrument that throughout its physicality translates deeper in the psychology of the society that use them. In both cases: The Panopticon and the House Machine is an instrument used architecture despite the finality, but both of them seems to apply to disappear the mechanism that is used, to vanish it.

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[38] Ib, P. 101.

[39] Le Corbusier. Feststellungen zu Architektur und Städtebau. Switzerland, 2001. P.75

Conclusion: To Shape the Human Spirit

The Machines such as the one developed by Bentham and the one developed by Corbusier, might not be only ones, like Foucault and Fampton mention the design for the ideal town of Chaux by Ledoux could be seen in some extend as member of these utopic schemes. They belong in some extend to idealizations of a political and social structures.

What makes the machinery analyzed here have a relation or what could see as a binding line is the Industry as the new ruling power behind them. Their contexts have an upcoming new political, social and economical power behind them. What they do is to respond towards this force with a mechanism to adapt people to the changes.

The way they do it isn't just a formal or a conceptual approach. They both do it through a scientific and methodological way. What they do is to subdivide in elements the reality and by changing or reorganizing them, they create a mechanism. This mechanism works as a society shaper.

It might seem contradictory the observations previously made; Architecture disappearing and leaving no trace behind it against Architecture as the physical representation of an historical moment.

Their proposals are based on the idea that the physicality of architecture acts deeper in the human behaviour, changing it, educating it according to political or social goals. But for this to happen the mechanism use has to disappear to the eyes of the user. Bentham has the discipline as goal while Le Corbusier has the *Lyrismus* as its ultimate possible achievement.

In our hands are those elements again. Through them we can as in an archaeological field (science again) decompose it and analyze it. But what makes this method so relevant to be used is the fact that the Panopticon as much as the House Machine are still today among us in many different ways. Their influence in different fields of knowledge makes the decomposing principle a useful tool to make interventions in spaces with such backgrounds.

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