

THE CUBE: AN INITIAL TOOL FOR TEACHING THE ARCHITECTURAL SPACE

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Abstract

The ability to imagine and express the resulting space architectural project has always been a key part of the architectural science. For the correct teaching of architectural design is necessary that students can have some ability to imagine and represent space. To imagine the space you need to have minimal control of the basic variables that define it, light, color, texture, rhythm. Ideally, in a first course would be to focus on an individual basis in every aspect of teaching. To represent the space, it is necessary that the student has mastered the techniques of representation, drawing, 3D virtual representations, and other means of representation. At the start of a first course in architectural projects would be perfect that students dominate these techniques of representation and the use of these did not pose an obstacle due the lack of control over them.

Considering the lack of initial knowledge, necessary to imagine and represent space, we seek a physical tool, capable of filling these gaps so that we could perform a specific teaching of the constituent elements of spatial definition without having to use techniques representation outside the student's ability to first grade. This ensures that the student can focus their learning on those constituent elements of architectural design education without distraction.

We propose the use of a cube 3x3x3 m. as support of all teaching, something like a blank paper but in a three dimension space. Student performed during the course, each of them, a succession of scale models 1:20, with the removable floor, so that the geometric figure may be seen by both the exterior and interior. Each set of models was performed focusing on a specific topic, according to a fixed order. All student proposals incorporated themes already seen, and the final conclusion marked a break from the box itself and the opening and distortion of space.

Using this tool we observe that the time needed for students to be integrated into the exercise was reduced considerably, reaching full involvement in the exercise almost immediately. This tool focused on each of the constituent aspects of the teaching of the project caused a greater depth and extension to its attention by the students. There was an increase in student's confidence in their own exercises by having an easy way of representation available to everyone. The internal spatial vision of the solutions provided by the students formed an integral part of their arguments, which are not likely to happen when using only plans and drawings

The experience is overwhelmingly positive looking at teaching ability and results.

1 PROPOSAL

The project learning is the process through which new skills are acquired, skills, knowledge, behaviors or values as a result of study, experience, training, reasoning and observation. This process can be analyzed from different perspectives, so there are different theories of learning. Learning is one of the most important mental functions and through the competition he gets real and effective professional future.

The learning process of the project must be oriented properly and it's favored when the individual is motivated. It is the result of individual cognitive processes by which they assimilate and internalize new information (facts, concepts, procedures, values), we construct new meaningful and functional mental representations (knowledge), which can then be applied in different situations to contexts where learned.

For the teaching of the subject of architectural projects is necessary to train the student in a certain capacity to imagine spaces. Hence, testing of these spaces is always considered as a fundamental part of architectural education.

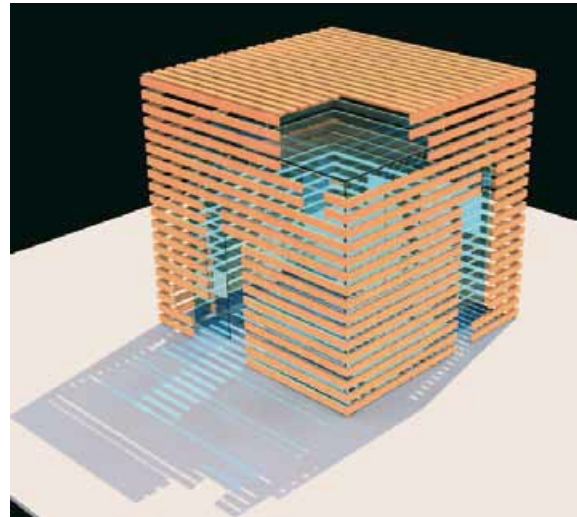
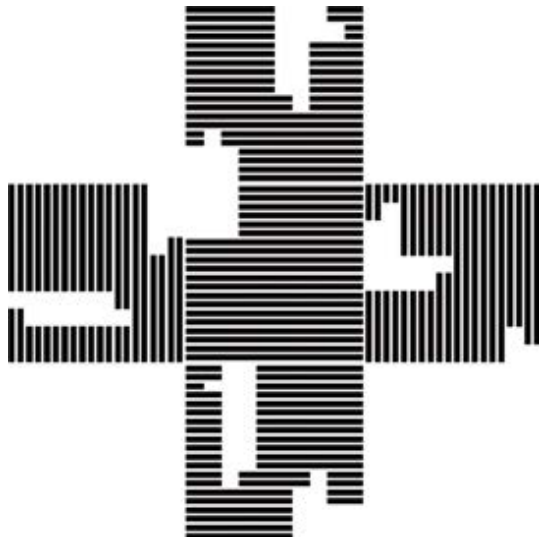


Fig. 1

It is about adding to the common learning on the architectural space an analogical qualified experience for callow specific students without experience on the architectural space, without previous knowledge on constructive systems and representation systems. The manipulation of a volume to characterize it in function of elementary qualities intends like an approach to the process of design of the inhabitable space.

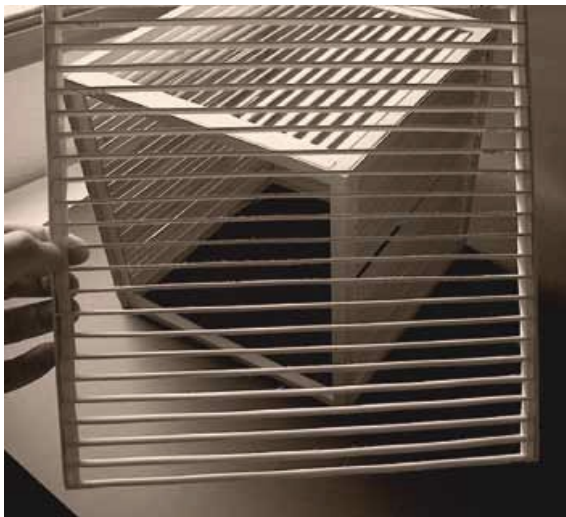


Fig. 2

The nurse of becoming –preached in Timeo [1] like element that sways unequally everywhere in a way that provides a base to what exists, invisible and amorphous species that admits everything and that participates in the most paradoxical and difficult way to differentiate from the intelligible thing- it is qualified as architectural space this which is defined to be livable. This specific place is a situation in which time and space are intertwined. This is where dreams occur, and life happens. Space is the substance that makes up the wonderful and wise Le-Corbusier game. In this game space is compressed or expands, flows or rests. Space is subject to the constructive elements that shape. These elements are what separate the architectural space of incommensurable outer space, which has been extracted.

This space is also built by time. When we speak of architectural space like an independent place course of life and time what we want to do is reject our mortal condition. This is an attempt to set the time in a space that not change and remains unchangeable.

The immobile building under the light of the day offers to the eyes and to photographic cameras, as a fake testimony of the true situation. The building never is a static object; it is constantly transformed by

shades that slip caressing their limits, imperceptible almost in dimness or in the darkness of the night, existing in the shade.

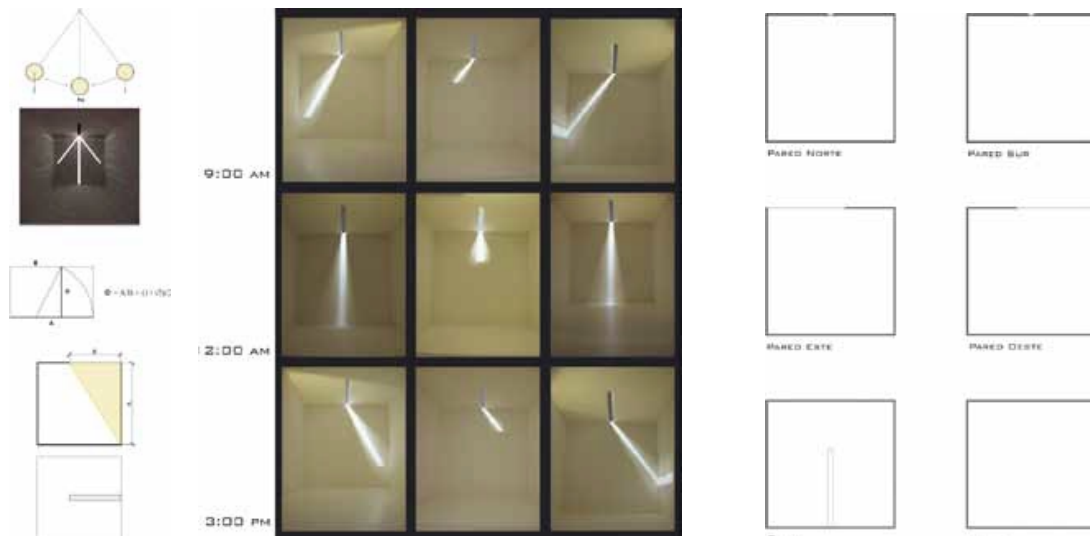


Fig. 3

The emptiness –“it is not occupied for the bodies, but it occupied by the empties itself among the things” [2]. Today the daily space-time is an epiphany of the Universe that doesn't lose its quality even when it's scale is reduced using a self-likeness fractal scale.

To build something with this material what has not previously existed we must overcome fears, relinquish ideologies, and live as immortal beings who accept their condition of belonging to a real time accepting our finite essence.

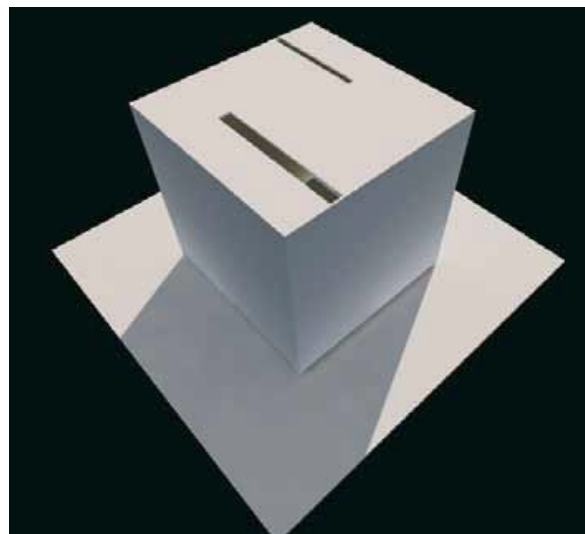


Fig. 4

"I am thinking here, naturally, in the time patina on materials, in the endless number of small grazes of the surfaces, in the shine of the worn and chipped varnish and in the borders polished by the use. But if I close the eyes and I try to leave disregarded all these physical prints and my first associations, it continues being, with everything, an impression, a deep feeling: a conscience of the course of the time and a feeling of the human life that it is carried out in places and spaces, giving them a special pregnancy" [3].

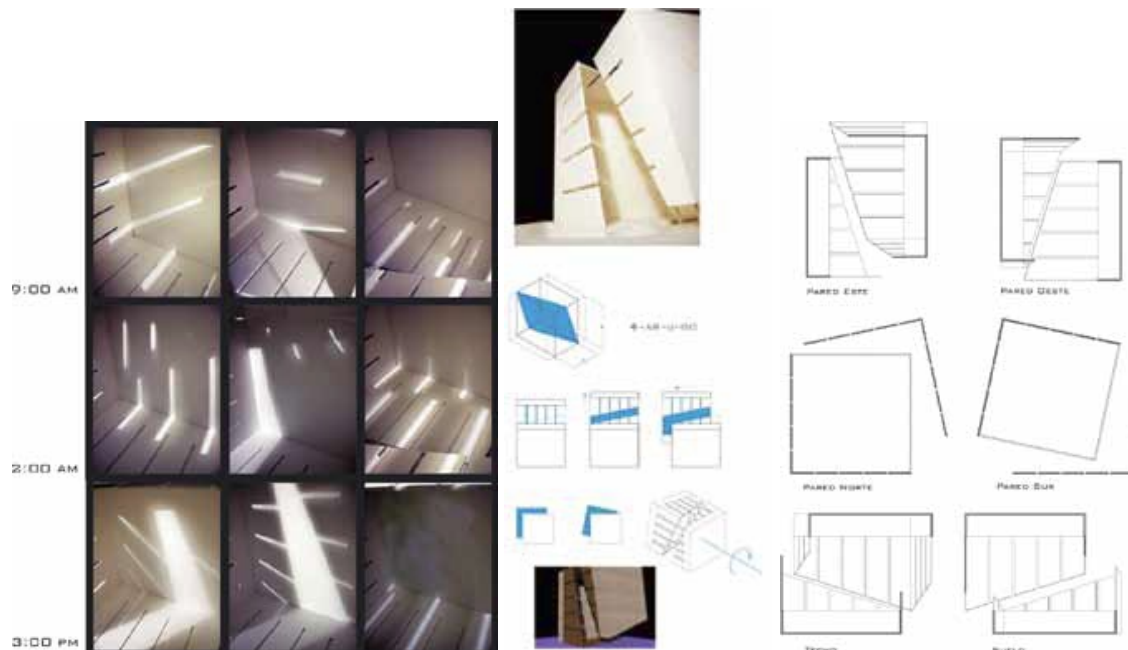


Fig. 5

The recognition of the architectural space as modeling manifestation of the space-time is contrary to sustaining a critical operative attitude in the Project [4], a ideology, that is to say a thought that substitutes the analytic rigor for judgments of formed value, fit for its immediate application: "an attitude as a critical process, expired in itself, since the judgments of value are measured with the influence of present time (...) that will unavoidably have to respond to continuously changing approaches" [5].

This way, once the architectural space is understood as a built and inhabitable space-time epiphany, then the future is forced, with an attitude that is not satisfied only with registering the events, but rather it pushes toward solutions and problems that still are not seen in an explicit way. A deduced principle of the very architectural matter nature is: "the reason can take out the appropriate consequences for all that should be made or not to make in Architecture" [6].



Fig. 6

The space-time is not only experienced in the "dynamic reading delle sequenze architettoniche", like Zevi [7] proposes, forgetting the shade. Architectural space is neither rigid nor still, but it is a dynamic

flow and a succession that doesn't reside in its quality of being an inhabited path. The dynamic reading of the space, their perception according to a trajectory continued by an observer, it should not be had by the only by a way of noticing the nature of the architectural space. In that way we are subtracting their essential characteristic.

The way in what the architecture space provides a base to what exists, is in their condition of modeling fragment that reproduces completely in their essence the all, space and intertwined time. The space is independent to the fact of being perceived, to the conscience of their inhabitants. The light field defined by the architecture is its own matter: an epiphany of the participant active space-time in the dynamics of the universe¹.

2 METHODOLOGY

Starting from a cubic given space, represented by scale models and with slight material, the student carries out a series of interventions on its encircling directed to materialize space qualities: illumination, color, texture, rhythm and functionality. In each case a new scale model is built and it is photographed its interior and its exterior, in different orientations and temporary moments, to obtain images similar to those from the same space to natural scale.

The subjects taught in the first phase are the initial topics that make up the teaching of architecture, broken down into the basic letters of their own alphabet. We refer to the rhythm, composition, light, color, building materials, the time and the limits of the space.

In the early days of teaching, we have the disadvantage of lack of ability of students to represent through drawing correctly imagined space.



Fig. 7

This was a time-consuming and effort to achieve the appropriate level of spatial representation. Also meant a great sense of demoralization for the student, and not able to express their ideas clearly.

Similarly the issue of designing a complex space formed by different components from the beginning of the process also meant a lot of confusion for the student, as it was not able to break down the problem into its basic elements easily.

We had two main goals at the beginning of the process. On one hand the break the barrier posed a lack of ability to represent space through drawing and on the other hand we needed to have a tool flexible enough to focus on teaching the elements that seemed most important.

For that reason we decided to use a 3x3x3 cube meters. This cube was built with the material chosen by each student. About this cube, as if it were a blank page they represented the exercises. In this

¹ The universe is full with matter, and this deforms the space-time of such a luck that the bodies are attracted, what excludes the possibility of a static universe, invariable in the time.

way we were getting the student started off with an initial three-dimensional neutral space to develop on all exercises. The cube always represent through a three-dimensional model, with footage that each one would seem more appropriate. This model is implemented in two different scales. 1:50 when the representation of outer space was needed and 1:20 when they wanted visit and experience the interior space.

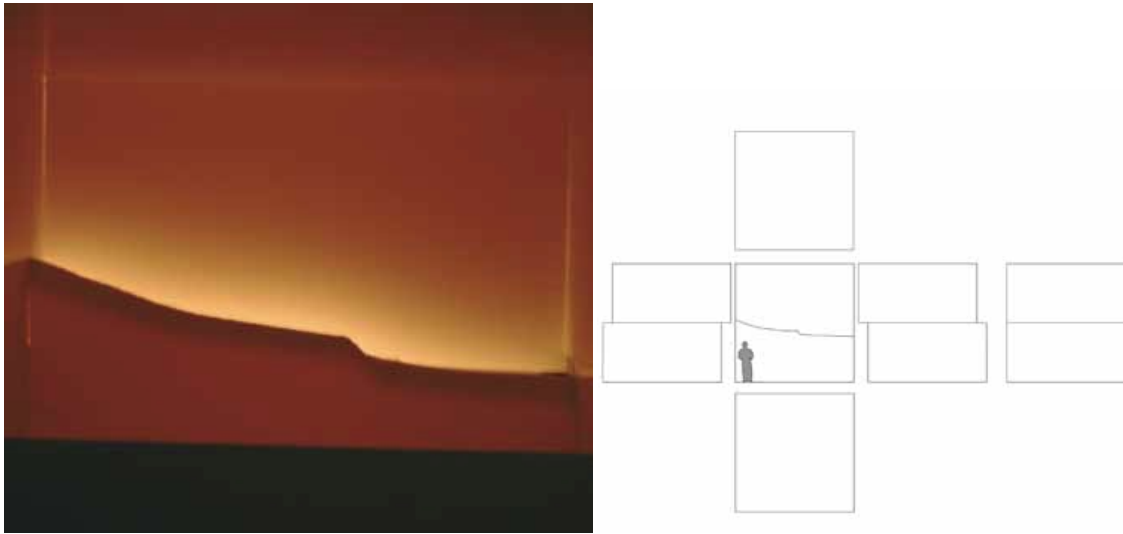


Fig. 8

Successive models were made by students each one focused on a topic. Thus the rate, composition, light, color, construction materials, time and ultimately rupture of these limits were studied individually and focused on each cube.

Each cube study involved the incorporation of knowledge acquired in previous cubes. Thus knowledge was applied like successive and superimposed layers to form at last the complex set initially sought.

3 RESULTS

The student's experience in the manipulation of the "cube" for "break of the box" and the obtained images of its group of proposals, under different orientation conditions and temporary sequences, is reflected in a critical collective session that favors the exchange of results in the group, enlarged by the analyses of the professors.



Fig. 9

The learning on the manipulated scale model is deepened by the visual experience on its photographic representation, similar to the one from the same space to natural scale.

The approach of the student to the process of design of the architectural space, by means of working on built scale models with slight materials, easy to manipulate, and of its visualization for pictures from different angles, adds to the exercise the value of the experience in the representation of the physical limits of the space and the space-time interlacement.

Using this tri-dimensional tool was achieved the following results; without the previous difficulty to draw was a problem for them 100% of the students became involved in the subject from the beginning. So were had for more time available for teaching technology architectonic project, which is the main reason for our classes.

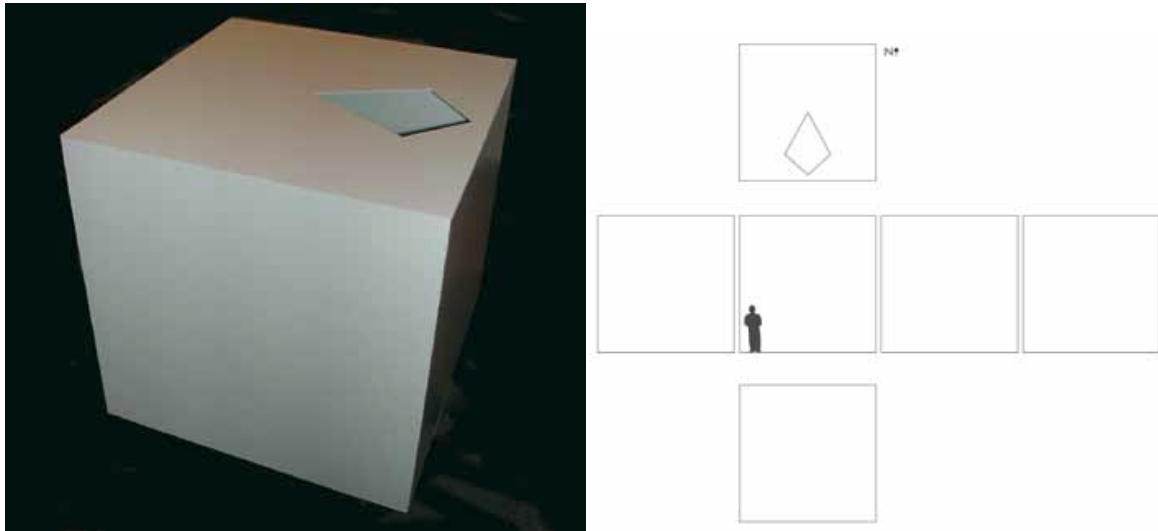


Fig. 10

We were able to separate the teaching of a complex concept as architectural space in the various component parts. Thus we focus very deeply and teach each of the components. It was a very rewarding experience teaching complex concepts like time in architecture.

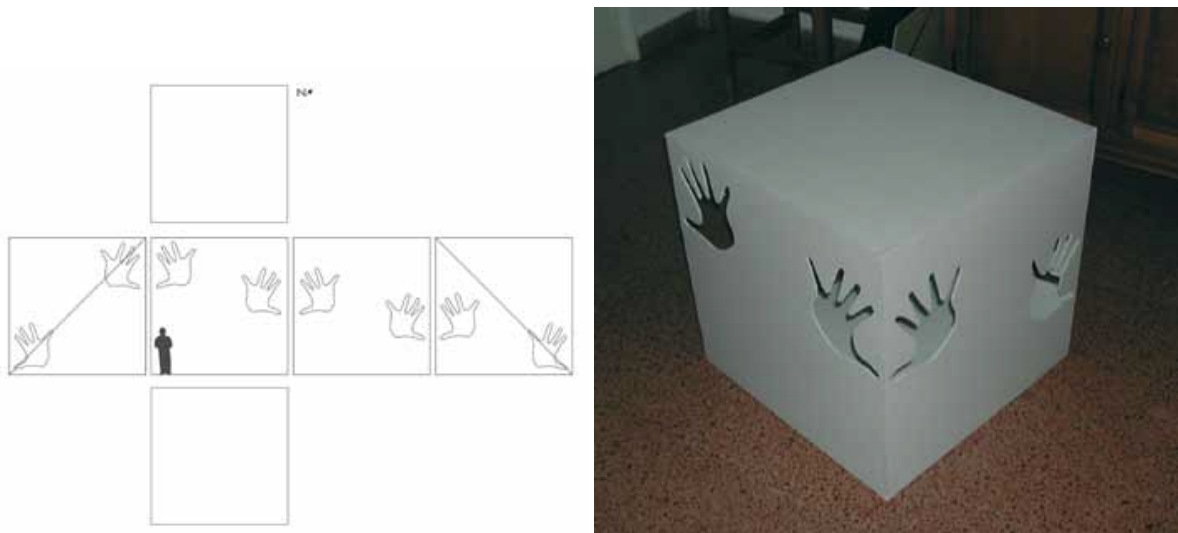


Fig. 11

4 ORIGINALITY

The student's learning on elementary characteristics of the architectural space and the process of their configuration under lower concrete determinations –in a first design course- it begins without requiring of a specific experience and avoiding, by means of the grade of abstraction of the exercise that the student transfers his "common" knowledge of the inhabitable space mechanically to the characterization of the architectural space.

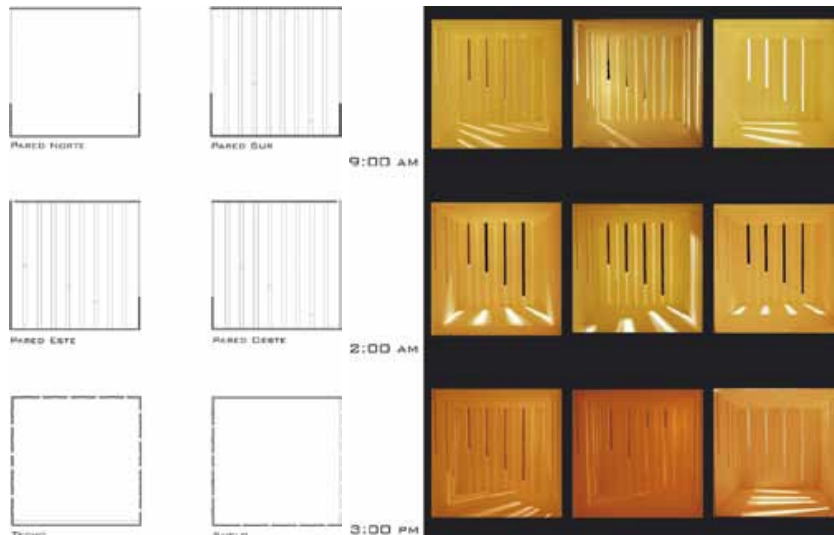


Fig. 12

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- [1] Platón. Timeo. En Diálogos VI de Biblioteca Clásica Gredos. Ed. Gredos, Madrid, 1992. p.155
- [2] Tito Lucrecio Caro, De la naturaleza de las cosas. Ed. Espasa-Calpe. Madrid, 1969. p. 45
- [3] Peter Zumthor, Pensar la arquitectura. Ed. GG, Barcelona, 2006. p.23
- [4] Manfredo Tafuri, Teorías e Historia de la Arquitectura, Celeste Ediciones, Madrid, 1977. p. 259:
 For operative critic one commonly understands each other an analysis of the architecture (or of the arts in general) that has as objective it doesn't unite abstract warning, but the "projection" of a poetic precise orientation, advanced in their structures and originated by historical analysis endowed with a purpose and deformed according to a program.
- Calvesi has spoken of "*critica proyectora*", not as much as "guide" of the artistic activity, but as an influence on the artistic projects due to stimuli that don't demand to be exactly carried out.
- [5] Ibidem. p. 285
- [6] Francesco Milicia, Principi di Architettura civile, 1781, parte I. P. 29
- [7] Bruno Zevi, Architettura in nuce. Sansoni Ed., Firenze, 1979. p.45