

# LANGUAGE AND COMMUNICATION IN THE SCOPE OF HOSPITAL ENGINEERING AND ARCHITECTURE

Paloma Úbeda Mansilla

UPM

School of Architecture

paloma.ubeda@upm.es

Ana Roldán-Riejos

UPM

School of Civil Engineering

ana.roldan.riejos@upm

Ana Serrano Mazo

Serrano Evans Architects

Architect

ana@serranoevans.com

**Abstract:** This paper deals with the language and communication used in the field of Hospital Engineering and Architecture. Firstly we describe the concept of language and communication from a linguistic and cognitive point of view (Lakoff 1987; Fauconnier and Turner 2001) paying special attention to the use of imagery and figurative language, such as metaphor, to highlight the most relevant types found in this area. The examples provided in this article have been classified according to constitutive and explanatory metaphors. Both categories belong to conceptual maps shared by engineers and architects and are referred to their mental understanding of a hospital. The daily use of this metaphorical language provides this professional group with powerful communication tools that facilitates their expertise for example to heal their most direct patient, the Hospital. Our main aim is to show the implications of thought and language in communication and in daily professional practice. Thus, the visual representations of a few hospitals have been selected to illustrate on one hand, the hospital image as a visual metaphor created on purpose, and how they can communicate and provide a positive or negative perception to the patients/ users. On the other hand, we examine if other care centres/hospitals without providing a metaphorical image to users can transmit a positive or negative image and impact also on their healing. Our conclusion suggests that hospitals design and maintenance can be perceived by the patient through the building and its systems, and can contribute to their wellness and ultimate recovery.

Key words: architecture and engineering language, metaphors, hospitals, cognitive language, conceptual maps.

## INTRODUCTION

A hospital (Wikipedia) is “an institution for health care providing patient treatment by specialized staff and equipment, and often, but not always providing for longer-term patient stays.”

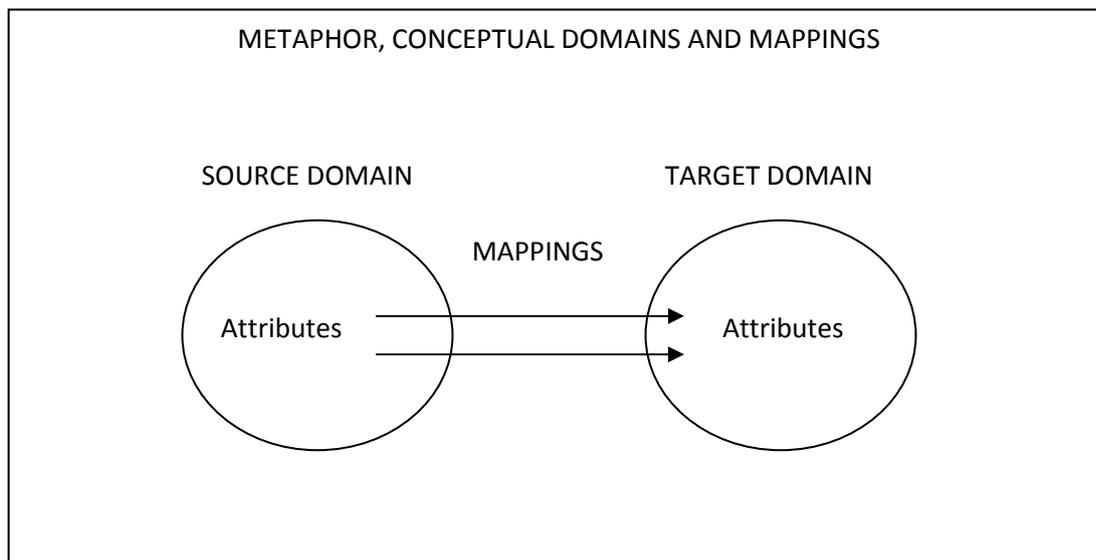
Hospitals need buildings to host patients and develop the above function and deliver their ultimate target, i.e. bring wellness and health back to the patient as quick as possible.

How are language and communication used by Architects and Engineers contributing to achieve these goals?

We will first set up some theoretical basis around language and communication resources in the framework of cognitive linguistics, and in particular related to metaphor as a powerful communication tool. Next, we will analyze and show some linguistic details common among the professional groups of architects and engineers, bringing up some examples in the framework of their mutual interaction as well as with other professional groups, and showing their impact on the maximization of the design and right operation of the Hospital. Thirdly, we will analyze the communication with the patients and their circumstances, showing examples and evaluating their effects on the patients' welfare. Finally, we will conclude that actually, there is an important correspondence on the language and communication used by hospital architects and engineers and the achievement of patient wellness and subsequent recovery.

## METAPHOR THEORETICAL BACKGROUND

Metaphor is defined in Wikipedia as “an analogy between two objects or ideas, conveyed by the use of a word instead of another” In other words, a metaphor is a figure of speech consisting of using words with a different sense of which they properly have, but in a way that keeps with it a relationship discovered by imagination” A more rigorous view of this powerful cognitive process considers two conceptual domains with specific attributes that can bring correspondences from one domain to the other. The source concrete domain is normally more familiar or easier to understand, is projected onto the target abstract domain, more complex to understand. By referring to the source domain, the processes of reasoning, understanding or describing in the target domain become easier.



According to Taylor, the cognitive paradigm considers metaphor: “as a means whereby ever more abstract and intangible areas of experience can be conceptualized in terms of the familiar and concrete (...) metaphor is thus motivated by a search for understanding”. (1995: 132).

If the above definitions are brought to the building /hospital context, the following examples can be found: “Maggies Inverness Centre is a harmonious and connected meeting of landscape and built form” (page & park Architects 2005 Holland [www.e.architect.co.uk](http://www.e.architect.co.uk)).

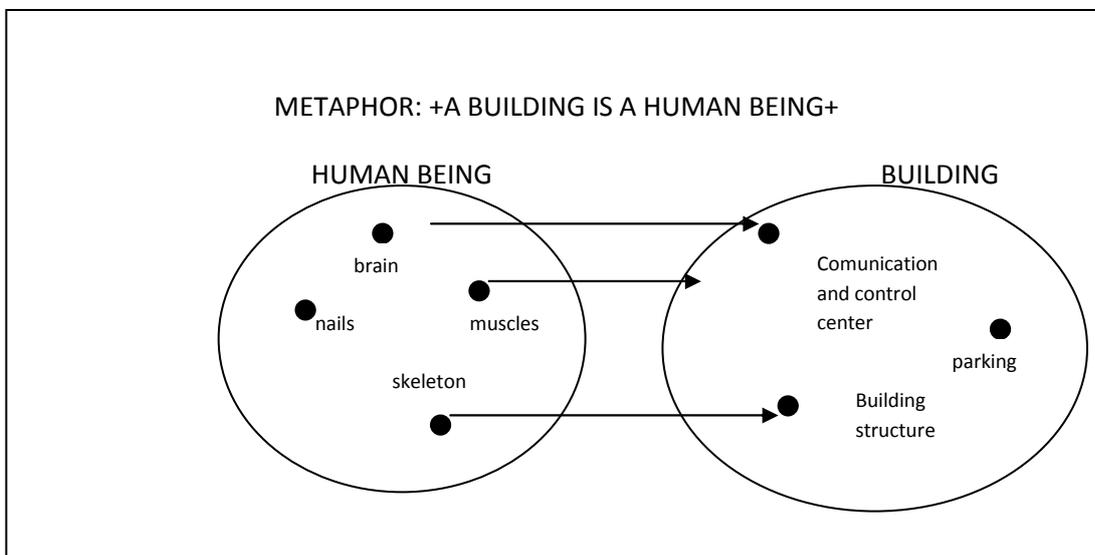
There are many types of metaphors; however, in this work, we will focus on the most

common ones in the professional fields of architecture and engineering which are:

- Constitutive metaphors, which are built-in, entrenched, unconscious in the language
- Explanatory metaphors, which are explicit, picked up from a background to explain something or reinforce an idea in a more clear way. This type of metaphor exists in all language fields
- Visual metaphors, which establish the correspondences in a visual way.

Thus, the constitutive metaphor is broadly used in the daily language of architects and engineers when they refer to the building structure in technical contexts and that, since it has become so entrenched that, they can hardly identify it as metaphor itself. In other words, these metaphors make up the everyday language of architects and engineers. For instance, when architects and civil engineers talk about the concrete state of a building they can say “The building is suffering from harmful organic conditions”; “The pathology of the building” or when they are describing spaces they refer as “the cellular spaces are located to the north”. Thus, a basic constitutive metaphor for this group of professionals is + THE BUILDING IS A HUMAN BEING +. (Roldán et al. 2001)

The explanatory metaphor is also broadly used in the scope of architects specially to provide a clear explanation about their projects. Sometimes it can be considered as a fuzzy category that merges with the constitutive one, e.g.”The façade of the building proves a dramatic view” “The health centre is a box built on the idea of repeating and adding modules.” This type of metaphor is a clear candidate to becoming a constitutive one when used frequently by a group of professionals. In architecture language, we can find examples such as “The structure of the building is like a table” or “ in this project the green space supports the heart of the city”.+ THE BUILDING ARE BODIES+ +THE BUILDING IS A HUMAN BEING+ e.g. For example the Centre for Clinical Science Research (CCSR) ([www.fosterandpartners.com](http://www.fosterandpartners.com)) is commonly referred to as a birdcage. And Norman foster describes it with the simple explanation of two symmetrical wings which frame a central courtyard, connected at roof level by a screen of louvers.



The visual metaphor brings the observer to the conceptual domain intended by the image that is perceived; so if a building has a particular shape that reminds us of an object, or an element from nature, or a piece of the body, we will “connect” with that conceptual domain and bring out associations or feelings naturally belonging to it, or will simply recognize it and get the across message the designer wanted to send. An example of such metaphor is the famous monument “San Lorenzo del Escorial” in Spain, a palace used by the king Felipe II in the 17th century that has a shape that reminds of a grid or a “parrilla” honouring the way that Saint Lawrence was killed for his religious convictions, i.e. burn to death on a grid. A more recent example is the International Neuroscience Institute. This unique facility is a building whose exterior is designed by the architect to resemble the human brain (http://www.ini.hannover.de/en/architecture.html) and the interior “along the horizontal section is a design similar to the structure of a human brain.



Visual metaphor provided by the architect: Brain- Building : Internacional Neuroscience Institute INI; Date of construction: 2003; City: Hannover (Alemania) Typology: Medical Center.

Another example where the architect provides a clear image in a building design connecting the clinic function for clients is given by Architect: Hiroki Tanabe



Visual metaphor provided by the architect: Teeth -Building: Dental clinic: City: Nagano Japan; Typology: Dental clinic.

In the next section we will describe how the use of metaphors among architect and engineers when referring to hospitals is a broad and powerful tool that helps communication in daily language in order to design and operate them and allow also to communicate with the patient and environment.

## **ARCHITECTS AND ENGINEERS LANGUAGE AND COMMUNICATION**

Any professional group has its own language. The message received depends on the message that the author of a particular work wants to convey –the way his/her work has been built- and on the receiver, that is, on our only and individual condition, as well as on our cultural, emotional and intellectual background. Both elements of communication are important to understand the reflections presented in this paper. Their origins are the cognitive processes inherent to human being at large, and we will focus on the professional group of Architects and Engineers, particularly on those who are involved with hospitals.

Language cannot be analyzed as an isolated phenomenon, but in relation to the situations and objects it is referred to and, above all, paying attention to the speaker's mind as conceptualizer of situations and objects. Therefore, when we try to understand either a fact or the language coming from a professional group, we do it in form of a cultural product, placed at a whole system made up of the experience and of the recipient's expectations.

When we talk about specialised language, in this case descriptive/technical discourse regarding to hospitals, we usually refer to a type of language that gathers some features and characteristics that make it, so to say, unique, in relation to other specialities. Those features could be found at a micro level (word choice, specific connectors, etc.) and at a macro level (discourse conventions and organisation, strategies of communication, and similar characteristics). Its function is to serve as a vehicle of communication among one community of experts. Therefore, we can assume that this type of language has been generally accepted as such, and is therefore shared by that community of experts. (Roldán-Riejos and Úbeda 2006).

Adolf Loos, an architect from Vienna, considered that architecture should evoke emotions. He expressed it in the following words: "Awakening Emotions in Man: the task of architecture is to specify those emotions. The room should be pleasant; the house must have a pleasant appearance. The court must appear as a threatening gesture to the hidden defect. The bank must say here your money is tucked away safely in the hands of honest people." (Muñoz, 2001:17).

Regarding to Hospitals as major prototypical building it can be said that the above quotation is even more remarkable, due to the fact that Hospitals themselves are places where emotions are seen as a site where curing and productivity arise, not only for patient but also for people who work in them. (Del Nord, R. 2008: Vidal, L. 2008). Hospitals as building prototype have developed a huge metaphorical language, from architects and engineers when they refer to them in the metaphorical image o feelings that hospitals provide to people. This idea is also transmitted in the apparent metaphorical atmosphere that surrounds the world of hospitals.

In the field of Hospitals we are particularly interested in studying how and why metaphor interacts with a given technical building such as a hospital and, by extension, with technical discourse at large in the field of architecture and engineering. Finally the metaphorical image of hospitals will be also considered. It seems plausible to assume that the function of metaphor may vary according to the audience message and secondly we also assume that

there may be cross-linguistic differences in another language (i.e. English and Spanish) even within identical Hospital architects and engineering language.

Forty (2000) from the perspective of Architecture recognises these cognitive linguistics processes: "Successful metaphors rely on the unlikeness of things, not upon their likeness. The characteristic of an effective metaphor is it borrows an image from one schema of ideas, and applies it to another, previously unrelated schema." (Forty 2000: 100)

In the field of engineering, hospitals are the most complex building types. Each hospital is comprised of a wide range of services and functional units. These include diagnostic and treatment functions, such as clinical laboratories, imaging, emergency rooms, and surgery; hospitality functions, such as food service and housekeeping; and the fundamental in-patient care or bed-related function. This diversity is reflected in the breadth and specificity of regulations, codes, and oversight that govern hospital construction and operations. Each of the wide-ranging and constantly evolving functions of a hospital, including highly complicated mechanical, electrical, and telecommunications systems, requires specialized knowledge and expertise.

In the field of hospital language contexts, and regarding to the building concrete health, we can find metaphors such as "The building is suffering from a harmful organic conditions"; "Its thirsty materials suffered from temperature stresses"; "there was danger of fracture geometry so it was decided that it model a stimulation treatment"; "the building is finally treated. The curing process lasted over a month"; "after a period of time the building had an excellent aspect and, to complete the job, the land around was finally manicured" etc. (Roldán, et al. 2001).

In fact, in architecture the influence of metaphors drawn from biology and its different branches can be traced in some of the present architectural jargon (e.g. "rib", "wing" "spine" "skeleton" "heart"...etc.

But the key metaphor (described in the previous section) is THE BUILDING IS A HUMAN BEING which in turn implies THE HOSPITAL IS A PATIENT. Thus, the architects and engineers can be seen as doctors and Hospitals have pathologies that they have to treat. E.g. Evelina children's Hospital\_ 2005 London (England) by Hopkins Architects said: The base of the conservatory is the social heart of the building" [www.hopkins.co.uk] (...) "This is the social heart of the building, which has been deliberately designed to be flexible so that it can accommodate a number of different activities" quoted in [Phaidon Hopkins2]

Furthermore, regarding the adjectives that engineers and architects use when referring to hospitals we find two relevant groups: One focuses on the metaphor +THE HOSPITAL IS A LIVING ORGANISM+ and we can find adjectives like "organic", "sinewy", "muscular", "cramped", "blind" ,"grafted"...etc. e.g. Riken Yamamoto describe his mental clinic of Okayama as "The panels, which have been treated with preservative" and that "I described at the outset the trouble I had deciding how much of the cedar-panel facades to leave open because my quandary was symptomatic of this ambiguity" [[Riken Yamamoto book]

The second group suggests the metaphor +HOSPITALS ARE PEOPLE+, and buildings are presented as "soulless", "mute", "dumb", "conscious" etc. 3LHD Architects when describing

the Private Medical Centre for Firule said “The façade with its horizontal bands that covers the house like the bandages are protecting the patient” or “As a form, it settle upon the neat lines of the hospital, and engages within penetrating the building envelope and courtyard with various tendons.”

We can note that metaphorically speaking +the architect/engineer is a creator+ and +the architect/engineer is a doctor+ when referring to the building pathologies.

Taking into account the above examples we can find two clear metaphors. Firstly, conceptual metaphors, which can constitute complete semantic fields, unlike image metaphors, which simply project the schema of a mental image over another one. An example of image metaphor would be +The Hospital is a Brain+ including a Visual Image (Hannover’s neurosurgery centre). An example of conceptual metaphor would be +A HOSPITAL IS AN INTELLIGENT BEING+. (metaphorical expression with a conceptual image) This would trigger a number of immediate correspondences with a brain (the centre of communications, control and safety systems), with senses (temperature sensors, video-cameras), with the nervous system (communications, control and safety wirings going from the control room to the sensors), with the cardiovascular system (water), etc. Consequently, it would be possible to reflect on the building in the same way as on an intelligent being.

It seems clear that they have become shared and accepted by the engineering community, even though, for the layperson they may result odd and unfamiliar. However, in the scope of architecture, the use of metaphors are definitely used in three ways mentioned above, namely constitutive, explanatory and visual and their occurrence is mostly an unconscious feature and a key element in engineering/architecture communication (Úbeda 2001).

At the end of the day, architects create the skeleton, the bones, the skin, and engineers create the nervous system, the cardiovascular system, the brains, the senses, and later on to keep it running. In hospitals, not only they deal with the building but also with the patients... The consequent metaphor is that +HOSPITAL ENGINEERS AND ARCHITECTS ARE DOCTORS+. Interestingly, the reverse metaphor works as well; +DOCTORS ARE ARCHITECTS AND ENGINEERS+. A correspondence between attributes of the two conceptual domains would be:

HOSPITAL	BODY	DOCTORS	ENGINEERS	ARCHITECTS
Computer Room	Brain	Neurologist	IT specialist	
Sub-soil	Skin	Dermatologist	Foundations	
Structure	Skeleton	Traumatologist		Structure specialist
Communication centres	Nervous system	Neurologist	Beams, columns	
Water and sewage conductions		Nephrologist	Pipes, ducts	
Security Systems			Grout injections, lining	

## **LANGUAGE AND COMMUNICATION OF ARCHITECTS AND ENGINEERS WITH THE PATIENT:**

Considering the language that architect and engineers use when referring to Hospitals it is quite fruitful to understand the way these two groups of professionals work forward in the idea of improving the image that these type of building can produce on people and it is here where the visual metaphor has also an important role.

The building itself provide as a whole a visual metaphor created by the architect since the cognitive projection process started and comes to its end with a clear image of the intention of the architect. Sometimes they do it by using a final decorative intention or just recalling a creative image to call the attention for the public, users etc.

Mark Johnson quotation "Metaphor, rather than being solely a linguistic or rhetorical trope, constitutes a human process by which we understand and structure one domain of experience in terms of another different kind" (1987).

## **HEALING ARCHITECTURE**

Architects use the experiential and cognitive visual references that are embedded in their clients psyche to aide their explanation of proposed spaces during the design process.

Concepts of place and experience of space can be evoked through imagery before a building has been built – metaphorical or real - that acts as a trigger to the recollection of a feeling or experience, a memory or nostalgia.

The following examples show a metaphorical journey through the ethos of architectural spaces and their power to lift soul and body and ultimately to heal.

### **Hospital-hospice-hotel :**

The word "hospital" comes from the Latin "hospes" (a visitor or the host who receives the visitor). From "hospes" came "hospitalia", (an apartment for guests), the medieval "hospitale" and the Old French "hospital." It crossed the Channel in the 14th century and in the 15th century was a home for the elderly, the infirm or the down-and-out. It took its modern meaning as "institution where sick or injured receive medical or surgical care" in the 16th century. Other related terms include hospice, hospitality, hospitable, host, hostel and hotel. The Hotel-Dieu, name often given to a hospital in France during the Middle Ages, is the hotel (of) God.

A The building as a second home.



A museum? An art gallery? An invitation to explore the “other side of the glass”.

Richard Rogers Maggie Centre, England 2006.

“We want the building to make you feel as Maggie made you feel when you had spent time with her, more buoyant, more optimistic, that life was more “interesting” when you left the room than when you walked in.



B The building as a city.



*“Man articulates the world through his body. Man is not a dualistic being in whom spirit and flesh are essentially distinct (...)”*

*Tadao Ando Shitai and Space in Architecture and Body Rizoli 1998*

A light diffuser to the sky, a blanket of timber to your feet... a meditation space? a contemporary church? An art foundation building?

Fujimoto’s children’s centre for Psychiatric rehabilitation, Japan 2006.

“For the member of Staff their spaces act as a functional centre, for children their bedrooms are the centre”.



### C The building as a socio-political statement

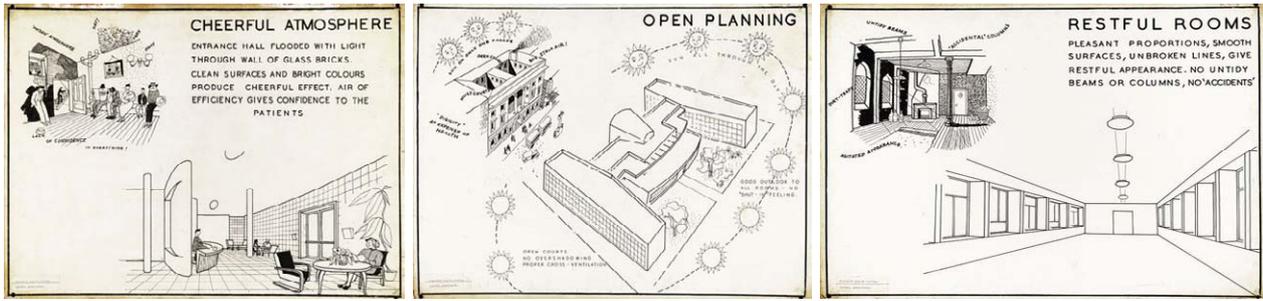


*“nothing is too good for ordinary people”.*

An entrance hall to a theatre...a gallery, a hotel reception from a film in the 60’s? A cinema or a concert hall foyer?

Berthold Lubetkin’s Finsbury Health Centre, London 1938, UK. “It was designed to be as beautiful as the hair of a beautiful girl in the summer sunshine”

“Externally, it was symmetrical, with two wings flanking a central block that contained reception, waiting and “electrical treatment” and on its upper floor, a lecture theatre with a partly covered terrace. The wings were tapered, opening like arms to make an embracing entrance courtyard facing south-west, which captured the sun through a gently convex glass block wall.”



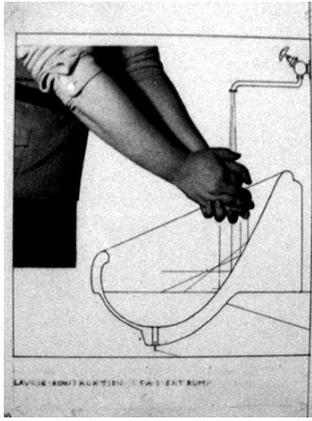
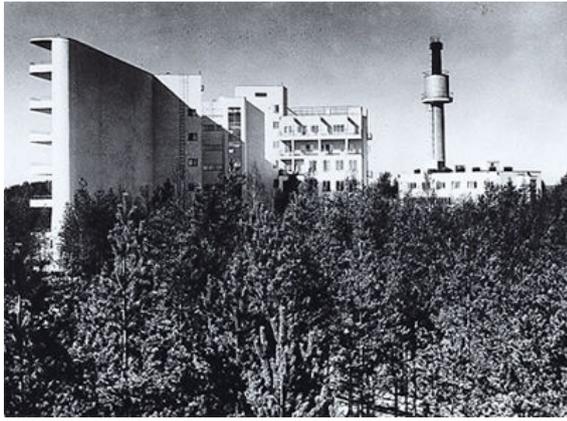
D A room with a view



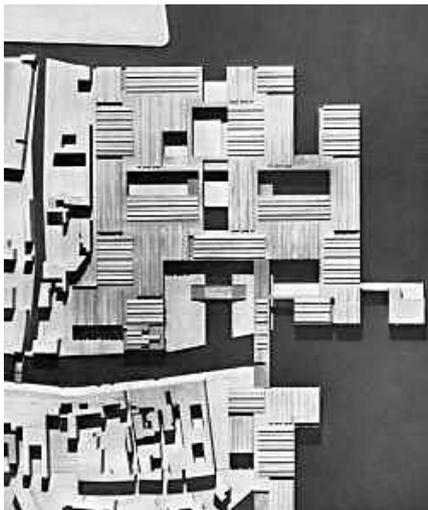
A building furnished entirely with specially designed fittings, love in the detail, careful attention to human comfort, lightness and materiality.

Alvar Aalto's Paimio Sanatorium Finland 1932.

..to project as much as it was possible with the media of the art of construction, for the small man, in this case even unhappy and sick..."



## E A “mat” building



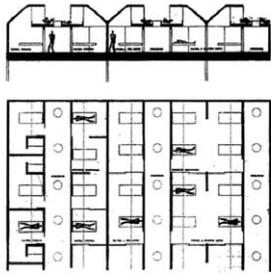
*And you, Earth, oh desperately humid Earth, are no more than apparent mould. And your water, as vapour or liquid, moved by a heavenly body of distant fire, brings you everything, joy or melancholy, abundance or misery.*

*(Le Corbusier, Précisions sur un état présent de l'architecture et de l'urbanisme)*

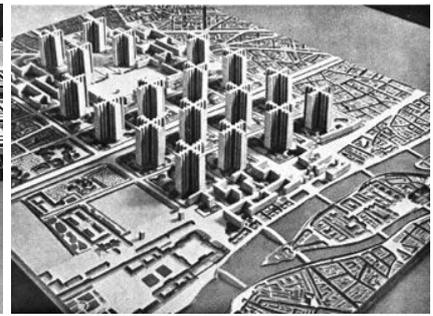
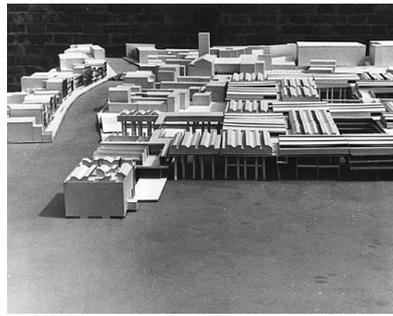
A city, a master plan, an “extension of the urban fabric” of a city by the sea?

Le Corbusier's Venice hospital, Italy 1965.

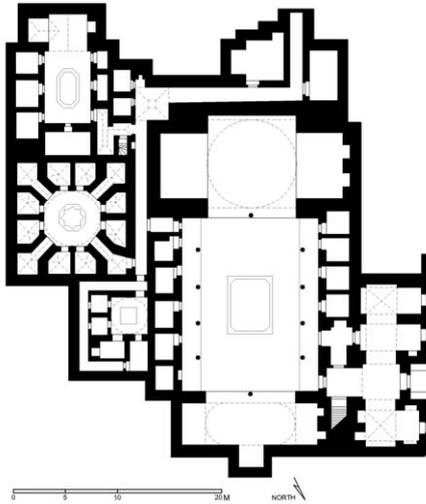
“I planned a hospital complex that can stretch like an open hand: a building without a facade, into which one enters from below, in other words from inside.”



2.5. La Colonna, City Hospital of Venice, section and plan



F In search of Eudaimonia\*



*\*(a state of bliss in which the divine powers are well disposed)*

A church? A cluster? A monastery, a cross with chapels to the sides for praying?

This is a maristan, the Islamic precedent of hospitals, Qalawun complex, El Cairo.

European hospitals in the XV century- charitable organizations run by Christians as hospices to the poor and ill people unable to afford therapeutic treatment- acquired the architectural styles of monasteries.

Centuries before that, in the Byzantine Nosocomeion the sick people slept facing the temple through a colonnade hoping for the gods to tell them a cure in their dreams to regain their health.

G The XXI CENTURY HOSPITAL must be a place where

I can look into the future with peace of mind

I can make important decisions

I can feel unique and valued

I can heal and save lives

## **CONCLUSION:**

Metaphor has traditionally been related to the world of literature and poetry. But metaphor is much more than just a poetical resort: as formulated by cognitive linguistics, it is a powerful cognitive process that allows effective and efficient communication of ideas and thoughts.

Thanks to language and communication and powerful recourses such as metaphor, be constitutive, explanatory or visual, the professional groups of Engineers and Architects cannot only develop more efficiently their work, therefore improving the quality of the infrastructure and its behaviour, but they can also send messages to their audience, patients, relatives and doctors, so the overall Hospital facilitates healing and wellness.

In fact, we could go further and establish a new holistic metaphor; +HOSPITAL ENGINEERS AND ARCHITECTS ARE DOCTORS+; not only they design and heal the building and infrastructure, but they also heal patients by achieving optimum performance of the functionality of the Hospital and by communicating in a visual and spatial way with patients and medical doctors, inspiring wellness, productivity, peace of mind, etc.

Finally, language, communication, and their powerful tools (conceptual, image metaphor, etc.) play a key role in this new dimension of such challenging and socially impacting professions.

## **BIBLIOGRAPHY:**

Black, M. (1962): *Models and Metaphors*. Ithaca, New York. Cornell University Press. Spanish translation by Víctor Sánchez de Zabala (1966): *Modelos y Metáforas*. Madrid. Technos.

Black, M. (1979): "More about Metaphor", in A. Ortony (ed.): *Metaphor and Thought*. Cambridge. Cambridge University Press, p. 19-41.

Cuenca, M.J. and Hilferty, J. (1999): *Introducción a la lingüística Cognitiva*, Barcelona. Ariel.

Forty, Adrian (2000): *Words and Buildings*. London, Thames & Hudson.

Gibbs, R. (1994): *The Poetics of Mind; Figurative Thought, Language, and Understanding*. Cambridge. Cambridge University Press.

Hickman, C. (2005) *Therapeutic Gardens: An Overview of the History of Hospital Gardens in England from 1800*. Paper Presented at the Forum UNESCO University and Heritage 10<sup>th</sup> International Seminar. " Cultural Landscapes in the 21<sup>st</sup> Century".

Johnson, M. (1987): *The Body in the Mind*. Chicago. Chicago University Press.

Karatani, K. (1995) *Architecture as Metaphor. Language, Number, Money*. Michael Speaks.

Lakoff, G. (1987): *Women, Fire and Dangerous things: What Categories Reveals about Mind*. Chicago. Chicago University Press.

Lakoff, G. (1990): "The Invariance Hypothesis: Is Abstract Reasoning Based on Image-Schema?". *Cognitive Linguistics*, vol. 1, n. 1, p. 39-74.

Lakoff, G. and Johnson, M. (1980): *Metaphors We Live By*. Chicago. Chicago University Press.

- Luis Vidal (2008) "Hospital Infanta Leonor": el hospital del siglo 21" IFHE BARCELONA 2008.
- Muñoz Cosme, A. (2000): *Iniciación a la Arquitectura: la carrera y el ejercicio de la profesión*. Madrid. Mairera.
- Osmond, H. (1959) "The relationship between architect and psychiatrist". In C. Goshen. *Psychiatric Architecture*. Wash, DC: American Psychiatric Association
- Osmond, H. (1969). How to judge a mental hospital. *Schizophrenia*. (2).95-99. Peterson, Robert F. Knapp, Terry J. Rosen, James C. And Pither, Bruce F. (1976) The effects of furniture arrangement on the behaviour of geriatric patients. *Behavior Therapy*. Vol 8, Issue 3, 464-467.
- Roldán-Riejos, A. (2004) "Strategic features of ESP from a socio-cognitive prespective" in *IBERICA Journal 7: Asociación Europea de Lenguas para Fines Específicos*, pp.: 33-53.
- Roldán-Riejos, A. Úbeda Mansilla, P. (2006): *Metaphor use in a specific genre of engineering discourse*". En *European Journal of Engineering Education*. vol.31, núm. 5. London .
- Roldán-Riejos, A. Úbeda Mansilla, P. et al. (2001): "The impact of visuals: Using a poster to present metaphor". En *European Journal of Engineering Education*, vol. 26, núm. 3, London. 20
- Romano Del Nord, (2008) "ENVIRONMENTAL DESIGN IN HOSPITALS", IFHE BARCELONA 2008
- Sommer, R. (1974) *Tight Spaces; Hard Architecture and How to Humanize it*. Prentice Hall.
- Taylor, J.R. (1995): *Linguistic Categorization: Prototypes in Linguistic Theory*. Oxford. Oxford University Press.
- Úbeda Mansilla, P. (2005) *Conocimiento y lenguaje en el ámbito de los arquitectos*. RIGA Journal 10 (Revista de Ideación Grafica Arquitectónica). Universidad Politécnica de Valencia: Valencia, pp.112-120.
- Úbeda Mansilla, P. (2001): *Estudio de un corpus de textos conversacionales en inglés realizados en estudios de arquitectura de habla inglesa: su aplicación al diseño de un curso de inglés para arquitectos*. Tesis Doctoral published by Universidad Complutense de Madrid. Madrid
- Úbeda Mansilla, P. (2002)a: "Metaphor at work: a study of metaphors used by European architects when talking about their projects". In *IBÉRICA*, n. 5. Revista de la Asociación Europea de Lenguas para fines Específicos (AELFE), 2002.
- Úbeda Mansilla, P. (2002)b "Estudio de un corpus de conversación profesional: el uso de la metáfora en los estudios de arquitectura de habla inglesa". Universidad Autónoma de México. In *Estudios de Lingüística Aplicada*, n. 36 (December 2002).
- Ungerer, F. and H.J. Schmid (1996): *An introduction to Cognitive Linguistics*. London. Logman.
- Walmsley, D.J. and G.J. Lewis (1993): *People and Environment: Behavioral Approaches in Human Geography*. London. Logman.
- <http://www.wikipedia.org/>
- Note: Pictures from building references have been taken from the architects' websites.