

Bianca Camargo Martins
(Organizadora)

O Essencial da Arquitetura e Urbanismo 2



Atena
Editora
Ano 2019

Bianca Camargo Martins

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2019

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Dados Internacionais de Catalogação na Publicação (CIP) (eDOC BRASIL, Belo Horizonte/MG)

E78 O essencial da arquitetura e urbanismo 2 [recurso eletrônico] /
Organizadora Bianca Camargo Martins. – Ponta Grossa (SP):
Atena Editora, 2019. – (O Essencial da Arquitetura e Urbanismo;
v. 2)

Formato: PDF
Requisitos de sistema: Adobe Acrobat Reader
Modo de acesso: World Wide Web
Inclui bibliografia
ISBN 978-85-7247-266-1
DOI 10.22533/at.ed.661191704

1. Arquitetura. 2. Planejamento urbano. 3. Urbanismo. I. Martins,
Bianca Camargo. II. Série.

CDD 720

Elaborado por Maurício Amormino Júnior – CRB6/2422

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2019

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APRESENTAÇÃO

Nos dias de hoje, é muito discutido o papel social da Arquitetura e do Urbanismo. Por muitos anos, o papel social foi interpretado apenas como a arquitetura específica para as camadas populacionais de menor renda, sem acesso ao mercado formal de moradias – e de arquitetura. Porém, com a crise urbana em que vivemos atualmente, onde grandes parcelas da população não tem acesso às “benesses” do espaço urbano, essa discussão voltou à tona.

Muito mais do que levar a arquitetura para os mais necessitados, devemos reinventar nossa prática profissional para sermos os agentes transformadores da sociedade atual e enfrentarmos os desafios, sociais, políticos e econômicos que estamos vivenciando diariamente em nossas cidades.

Esta edição de “O Essencial de Arquitetura e Urbanismo 2” apresenta experiências das mais diversas áreas da arquitetura e urbanismo, como: arquitetura, ensino, conforto ambiental, paisagismo, preservação do patrimônio cultural, planejamento urbano e tecnologia. Assim, busca trazer ao leitor novos conceitos e novas reflexões para a prática da arquitetura e do urbanismo.

Neste contexto, é abordada desde as metodologias pedagógicas ativas a serem utilizadas no ambiente escolar até a compatibilização de projetos com o uso da Metodologia BIM (Building Information Modeling). A acessibilidade é abordada a partir de diversas perspectivas: desde um edifício isolado até a acessibilidade de uma cidade, evidenciando a importância da discussão nos dias de hoje. Cabe destacar também os estudos de análise de edificações culturais e de cenografia de exposições e performances. A relação da cidade com o seu patrimônio cultural é tratada em diversos capítulos, desde a gestão patrimonial até a utilização de cemitérios como espaços de memória – uma iniciativa prática que demonstra que a arquitetura, assim como a cultura, está em todos os lugares. Dou ênfase também à importância dada ao patrimônio imaterial, tema de extrema relevância e que é, muitas vezes, desvalorizado pelo poder público.

A discussão sobre a dinâmica dos espaços urbanos é extensa e deveras frutífera. Nesta edição, os capítulos focam na importância da arborização urbana para o bem estar da população, na participação popular nas discussões sobre a cidade, na problemática da existência de vazios urbanos em áreas urbanas consolidadas, nas estratégias de *city marketing*, na cidade global e demais temas que comprovam a multiplicidade de questões e formas de análise que envolvem a discussão sobre a vida urbana.

Por fim, são apresentados estudos sobre novas tecnologias e materiais voltados ao desenvolvimento sustentável, especialmente no tocante à gestão de resíduos da construção civil e à mitigação de riscos e desastres.

Convido você a aperfeiçoar seus conhecimentos e refletir com os temas aqui abordados. Boa leitura!

Bianca Camargo Martins

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TRANSFORMATIONS TO THE CLOISTERS AND THRESHOLD OF PAVILIONS IN HOSPITALS OF MEXICO

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INTRODUCTION

The architecture which landed on the New Continent with the arrival of colonization, was developed according to the interests, ideas and constructive techniques brought to the American continent by the European crown, also importing the conditions that reaffirmed the triumph and domain of interests permeating the concept of the world's local cultures, along with new behaviors of foreigners, like when adopting the architecture with the characteristics of cloisters.

In that imposed new architecture, other ways to live within the constructions were developed; wherein environments identified with values that reinforced, reaffirmed and conserved customs of the European culture, thus isolating their inhabitants from the local mundane life; and structures were equipped with diverse services to function independently. In this way, the architecture came to reflect the system of social cohesion that was imposed by the conquest on the indigenous world. The

typology of cloister was applied defining the architectural structure that persisted for several centuries, even beyond the viceregal period, becoming a point of reference to project and order the constructions, besides contributing to consolidate habitability conditions by natural means in its interior.

The organization of the space in the cloister with the layout of a central patio, allowed conceptualizing the architectural plan in a practical way. The individual rooms, living rooms, and general spaces, were placed around the courtyards symmetrically in order to facilitate their sizing, the structure of the construction system, the sequence in the spaces and their communication with each other. The spaces were linked to a corridor working as a connector to articulate, give unity to the whole, and to make it functional. This disposition broke the local compositional scheme of the open space to confine it between thick, vertical and high walls; this architectural typology provided security and spiritual introspection to its inhabitants.

The courtyard, an open space contained within another enclosed space, worked as a window open to the sky; to allow seeing the cosmos and looking beyond the immediate;

It was believed to be a way to connect with the Divine force in addition to opening to the universe, to infinity or to look at the stars and the moon. They are architectural vain through which rainwater enters, the air and the light and heat of the sun are captured. For this reason the courtyards were essential for habitability in the constructions and for centuries the ideas of shelter were amalgamated with those of optimizing the environmental conditions. At the beginning, the courtyards were square or rectangular, usually with conventional orientations. Later, in the 18th century, other geometries were projected, varying their shape but preserving the environmental concept that remained the same for habitability; not so the self-absorption that was related to spiritual vows and the vision of understanding diseases as a divine punishment, because everyday life was transformed with economic development, conditioning social relations in open spaces, and the relationship of architecture with the urban image, which altered the typology of cloister. Economic and commercial relations with foreign countries intensified and impacted the organization of local communities and spaces, stimulating changes for the deployment of new architectural genres.

Despite the fact that the spaces organized in the cloister spread in the new continent, the establishments destined for social assistance include hospitals, hospices and asylums, because they helped to mitigate the consequences of colonization and in times of epidemics or famines. It is important to indicate the possibility that there were several hospitals built with the same typology in the different routes in which the conquest was expanded in America, due to the need to serve the conquerors¹ and that the service was extended to the local populations. When changes in the threshold of Independence were approaching, the typology of cloister was transformed because new ways of understanding diseases in relation to nature and social organization were developed.

BETWEEN FAITH AND SCIENCE

In the transition from the 17th to the 18th century, the Old Continent entered another dimension. Thanks to the industrial, cultural and political revolution, there was an ideological opening; social needs with a civil, public and general character were added to the moral values. The socialization of knowledge spread promoting the change that modified the architectural and urban culture. The new conception of the world centered in the critical reason and the order modifying the thought based on the divine will by the one of the experimentation and / or scientific verification. In the fight of interests the State appeared as a non-despotic authority, with faculties to grant public services of assistance and education and to promote public works; building civil and utilitarian edifications, integrated to urban milestones as part of the renovation process.

¹ The Nicola Di Bari Hospital is an example, located at that time in Santo Domingo Island, known today as Dominican Republic; it was founded in 1494. Another example is the Villa of Our Lady of the Assumption founded in 1510; these two are among others, expeditions that required hospital infrastructure to support campaign activities.

At the end of the century, in The New Spain more hospitals with the colonial structure were founded; those existing increased their capacity, updated some conditions of cure and the habitability augmented in the bedridden rooms. The hospitals were controlled by a Protomedicato that was responsible for the sanitary inspection, and the regulation of the exercise and medical practices, were linking urban health aspects as to promote physical improvements to inside. At that time, it was considered that diseases were transmitted by malignant humors caused by polluted air and water; this raised the importance of seeking prevention alternatives inside and outside hospitals and to experience organization of spaces in favor of health. With modern urbanism, prevention was developed in relation to the balance and harmony of the human body; nature argued the importance of forming harmonious unity with it as an essential source for living. This thought helped to improve the quality of spaces optimizing the benefits of nature: ventilation, lighting and sunlight. Ideas that guided and cemented the foundations for public health, considering that space could contribute to improving health, especially because life became more dynamic and the concentration of population made overcrowding and unhealthiness proliferate.

In Mexico City, public health policies were promoted to make urban improvements to avoid contagion and beautify the city. Sanitary groups were promulgated, multiplying the squares, green areas and esplanades; streets were expanded and paved to order the urban layout and sidewalks were placed; the channels and junctions that ran through several places became wider and deeper, and drinking water was also available. The measures contributed to the promotion of salubrity and hygiene as a precept of progress and social integration. It was defined the search for suitable places for the location of hospital complexes with buildings that highlighted the characteristics of this new format, the neoclassical. In the boiling of this social dynamic, the projects that were built stand out because of the contributions to the architectural composition and the novelties that the new architectural language manifested. The aesthetic treatment of the facades reaffirmed the change.

Hospitals stood out for their unprecedented forms of organization embodied in different sites; within the typology of cloister other dispositions are appreciated, that allowed to revolutionize the composition and to adopt new forms in their facades. This is especially noticeable in the bedding area, where overcrowding caused contagion, usually accentuated in the epidemic outbreaks occurred annually and causing more damage to the natives. Among the measures that were taken, was to modify the classification of areas according to the functions; their distribution responded to the environmental benefit that should be granted to the spaces in order to optimize the light. In the places where temperature was high, it was solved using the aeration, in a practical and simple way. In order to optimize the environmental conditions, the spaces had the best solar orientation as of the air currents. The apertures in the facades were multiplied; this influenced on how the sick rooms were arranged. It was important to conceive and design fountains and gardens that were placed in the courtyards or in the

perimeter of the constructions to heal the air of the interior by taking advantage of the one circulating in the exterior. There were also geometric patterns designs with artistic decorations for green areas and, in some cases water and sewer systems installations.

The variation in the composition of the architectural complexes filled only functional and habitability expectations. To extend more the courtyards of the cloister plant allowed experiencing diverse geometric forms, even as representation of the universe and science. The interest in calculating geometric shapes is observed in the arrangement of architectural ensembles. In the radial or concentric, triangular, octagonal or elliptical forms, the square plants of the constructions were blurred, and traced in narrow parallelepipeds that formed dynamic geometries in three dimensions. By narrowing the buildings, it was attempted to improve ventilation and lighting, even depending on how the building was oriented, the solar rays could enter the interior continuously. In this way, the transformations tended to constitute the architectural system of pavilions. For example, in the Hospital of San Lázaro, in Cuba (1748), the project outlined the habitability guidelines that would prevail for the design of new hospital buildings in America.

In the hospital of San Lázaro, the commons (sanitary) were separated from the architectural complex, placed in the backyard. To keep the commons clean, a system of channels was projected for water supply and for drainage; the secondary branches derived from a main branch; the network was projected with records for its maintenance and cleaning. The most interesting part of the project is the distribution of the rooms that were organized into double bays, arranged with a panoptic morphology, in rooms separated by a wide open corridor where the wind circulated generously and illuminated the spaces.

Image 1: Hospital of San Lázaro, Cuba (1748). A central garden and the breadth of the common spaces allowed cross-ventilation that benefited the recycling of air in the sick rooms. Drawing by Liliana Ángeles based on the plan of the Archive of the Indies of Seville.

Other hospitals were built with these characteristics, designed in the neoclassical format: the Comayagua (1783) in Honduras; that of Barinas (1787) in Venezuela and the Cumana (1797). The Bethlehem in Guadalajara, Mexico (1794) opted for the radial form.

Image 2: Schematic drawing of the Comayagua Hospital, Honduras (1783). The composition based on the square with larger courtyards, like windows open to the sky to introduce more light is observed in the transition from the cloister typology to the pavilion system.

In México, through the Academy of Fine Arts of San Carlos², the ideas of change promoted in Europe were filtered, imposing the logic and balance that denoted a new

² It was established in 1781 to train professionals in the construction field. Its aim was to fill the gaps that were required for new spatial needs, considering the canons based on universalism (globalization or architectural internationalism) which were disseminated through architectural treaties (in 1797 the architectural treaty of León Batista Alberti was published in Spanish).

code of beauty; oriented to a new taste in relation to the concepts of utility and simplicity. Thus, architecture experienced new challenges and the avant-gardes showed a different image, breaking the link with the baroque format to the physiognomy of the neoclassical format that claimed the naturalization letter in Mexico. Administrative and production genres disrupted the milestones of the past in the sense of monumentality and the formal organization of architectural ensembles.

Among other novelties that were added to the experiences acquired regarding to habitability in the typology of cloister and that can be understood already in the neoclassical format, is how the composition of the facades and all its elements was graced, which were designed to balance and harmonize the rhythms of the apertures with the massifs. By exposing the structure to the exterior, the facade became more evident and severe. To compensate for the proportion and to perfect the composition, architraves, cornices and jambs were outlined; organized conveniently to the structure, because in addition to balancing it horizontally as well as vertically, it highlighted the beauty and general functionality as of each of its elements. In the facades as in the corridors, the apertures acquired greater hierarchy and importance to penetrate light, sun and wind; accentuated with ornamental elements that functioned protecting the walls, the mezzanine, the doors and windows from humidity because they were made of wood.

Another preventive measure was solved with the formal proportion of the volumes and at the same time, to generate volume of air inside, enough to guarantee its recycling through cross ventilation, which made strategically place different openings; these, in turn, were designed rhythmically and in parallel. In the walls the openings multiplied and expanded their dimensions vertically, to penetrate to the deepest lighting and sunlight, which were controlled by wooden boards with crystals in doors and windows, divided into several parts to be opened by fractions to control the air currents, or they were made in two leaves to fold them wide open. In the facades, balconies protected by blacksmithing were designed to open wide the doors of the windows. The blacksmith was designed with admirable details announcing the intensive use of this material that would be developed in the construction. Masonry parapets were replaced by iron handrails.

In addition to the changes to the general composition and facades, there are significant changes on the roofs. When the spaces were conceived volumetrically and by diversifying the composition and introducing structural novelties, the apertures in the roofs were opened like windows open to the sky, to ventilate and illuminate the interior³, especially in the rooms that remained confined, skylights or domes with lanterns⁴ were placed. The apertures in the drum of the domes lightened the weight of the roof. Particularly, this improvement was made in the architecture that was recycled

3 In 1778 a contest was held to finish the towers of the Cathedral of Mexico. Years later, Manuel Tolsá concluded them crowning them with a lantern.

4 Between 1694 and 1699 at the Hospital San Pedro, in Puebla, Mexico, lanterns were adapted in the vaults of the roofs to ventilate and illuminate the rooms and be able to accept syphilis patients.

or refurbished to house a hospital. Of the relation between the openings with respect to the massifs, a game of chiaroscuro was generated. The interior and exterior formed a formal balance, related to the environmental aspect and the prevention of diseases; also, in the spatial sequence, architecture was connected to the urban space, its articulation recreated a game between open and closed spaces.

Many gable roofs were transformed into flat roofs, becoming rooftops, which meant placing fillings to enhance the slopes and sending rainwater to gargoyles installed rhythmically on the facades to lower the water in free fall and integrate it into the subsoil. This situation helped the rooftops to be conceived as an extension of the rooms while maintaining the compositional balance on the façades. The proportions between the base and the height were harmonized, and between each of its components or ornaments arranged to emphasize the horizontal and vertical structural rhythm. At the end of the century, the gargoyles were disappearing and the perimeter parapet of the roofs was part of the composition, becoming indispensable to hide the slopes of the roofs. When the gargoyles were replaced on the facades, pipes of clay or ceramics were drowned in the structure of the construction to lower the rainwater, later they would be made of molten iron, giving another importance, functionality and versatility to the roofs. In its perimeter, balustrades were placed and treated with artistic finials that emphasized the rhythm of the structure and indicating the location of the descent of water.

In the process, the beams of the construction system of some roofs were covered with coffered ceilings to make them more sober and reaffirm the simplicity, serenity and elegance; besides protecting the lower parts from moisture and dust, giving a feeling of spaciousness and cleanliness. It also contributed to design foundations with other options and constructive systems. Among other contributions no less important was the strategic relocation of the stairs. Its location emphasized the sequence, the transit and subjectively to the compositional axes. It reaffirmed its functional condition, of spatial distribution and the passage of air currents to spaces. These considerations were enough to break the established canons, being more evident when the neoclassical was established as an idea of change and in which the system of pavilions was created and affirmed.

In the pavilion system, a new reference was formed. While the use of iron was intensified as a structural reinforcement, on the walls and ceilings, creativity was encouraged in the design and calculation thanks to the knowledge of the constructive techniques⁵ and the professionalization of the construction that deepened rationalist thinking⁶. The constructive practice became more continuous, diversifying its use and form, because in other parts of the world it was introduced the placement of double T iron beams in the ceilings to support hollow brick vaults. They were initially experimented to

5 Mechanics, statics, geometry, decimal metric system and others related to mathematics.

6 At the end of the 18th century, the scientific method was fostered, justifying in this way the inventions and development of machines.

prevent fires⁷, and in a short time their use was intensified by the argument of solidity, durability and non-combustible. The smooth surface of iron contributed to prevention by avoiding nesting lice and bedbugs, main carriers of the typhus that caused so much damage in the population.

Thus, the system of pavilions that was developed with the neoclassical represents the avant-garde, the progress in the scientific teaching and the spirit of renovation that proliferated in the construction of the new genres of buildings that became new urban landmarks. They pointed to the change and new expression in urban and architectural composition. It consolidated the idea of progress that linked art to science, in a logical, measured reasoning of equity and aesthetic and artistic harmony. Logic and balance between parts of architecture defined a quantifiable harmony, affirmed the beauty in the rational perfection, it was the code and language of the modern spirit of then.

In this sense, the work of the architect Manuel Tolsá and other architects on the threshold of the 19th century is significant because their projects show modern thinking with a tendency to the system of pavilions. For example, in the Royal College of Mines, which was located in the most consolidated area of Mexico City, the compositional sequence was projected on primary and secondary orthogonal axes, in plan as in elevation emphasizes the central circulation and with a perpendicular axis, it communicates the lateral streets and circulates the cross ventilation from East to West. Similarly, to optimize the environmental resource, it is appreciated that to illuminate and ventilate some rooms that are practically confined between other spaces, it was solved by differentiating the heights, protruding volumes on the roof and in which rhythmically symmetrical apertures were placed on the walls to guarantee natural illumination and cross-ventilation.

In summary, on the threshold of 18th century modernity, knowledge was renewed and widened⁸. The scientific and technological revolutions helped to interpret the universe, to generate scientific and technological innovations that boosted productivity by questioning established precepts. It was pronounced toward intellectual rationalism with a diversity of positions that were increasing modifying the colonial structure and introduced to society new ways of inhabiting public and private spaces; in another way to understand the disease with new practices to which were added the lessons learned and the concepts of prevention and beauty related to science, technology, art and new social values. However, the experiences in favor of habitability in the cloister typology were taken up, synthesized and enriched as an idea of modernity that impacted daily life in America, entering the threshold where the system of pavilions was developed.

7 In 1789, N. Goulet built roofs with iron beams and hollow brick vaults.

8 Ideas condensed a philosophy, from which the codes reflected in the architecture emerged, then emphasized the content in a language loaded with symbolism; painting and sculpture reinforced architecture in this daily craft.

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Agência Brasileira do ISBN
ISBN 978-85-7247-266-1



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