

The design of the gargoyle in modern architecture

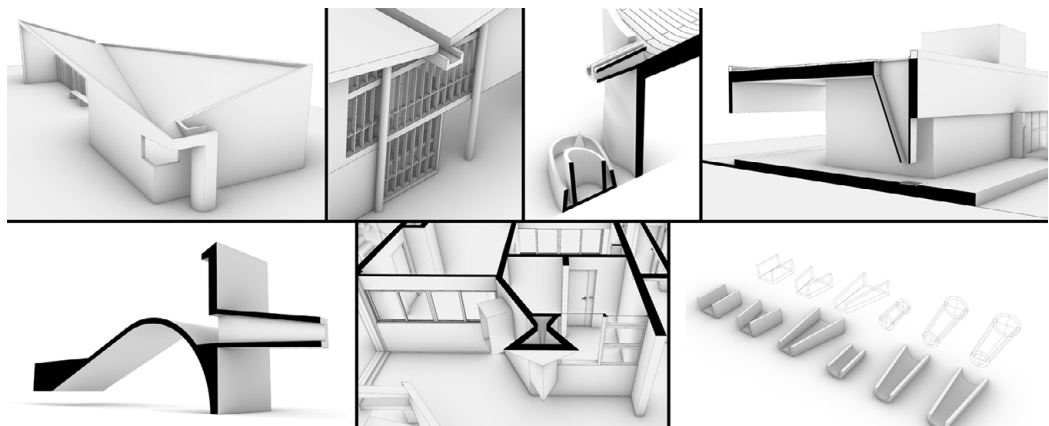
Wilson Florio
Ana Tagliari

Abstract

A constructive element present in classical and modern architecture, the gargoyle has a functional and technical character; but it also incorporates aesthetic aspects and symbolic significance. The modern gargoyle fulfills its technical function, but with a clean and austere design, as an extension of the canopy itself. In addition, the gargoyle element makes the course and drama of rainwater visible and honest. More than just defining and directing the course of rainwater; the design of the gargoyle is in tune with the architectural concepts of every modern architect. The present article explores the varied geometries of the gargoyle proposed by the architect Le Corbusier and establishes relationships with the most significant gargle proposals in modern Brazilian architecture. During the research, we produced redesigns and digital models to investigate the geometry of the Corbusian and Brazilian gargoyles of the 1950s and 1960s. The original contribution of the article is to identify a set of types of gargoyles, from the rectangular and trapezoidal gargoyle to the more elaborate geometry of gargoyles, composed of complex horizontal and vertical paths.

Keywords

Geometry, constructive elements, poetics, composition, roof



Gargoyles. Elaborations
by the author.

Introduction

The classical Treatises of Architecture have left a valuable legacy and knowledge, teaching us architecture through its foundations guided by the idea of constructive elements and composition. The classical composition sought beauty through the relations between the parts and the whole, considering elements and composition, proportion, rhythm, harmony, and geometry.

From Vitruvius to Guadet, the compositive principles of the *Treatise* constituted the design of buildings. However, modern architecture has questioned classical values, seeking to incorporate the idea of a more austere and honest construction. Thus, the constructive elements were depurated and left without ornamentation. Although at the beginning the idea of classical composition was questioned, some principles of organization of form, space, and order remained, but with a proposal closer to constructive rationality.

In search of new solutions in the era of the machine, and in a creative way, modern architects proposed to rework the constructive elements. In fact, there was no abandonment of the composition. Important modern architects, with classical formation, made the transition to a new period, where the exploration of new materials and new constructive techniques favored new opportunities for the language of architecture. As a result of these events, architects such as Le Corbusier sought motivations to rethink the building components but founded them on compositive principles.

In Modern Architecture, the design of the structural elements, sealing, openings, circulation, and sun protection. In this context, it is understood that the gargoyle, as an element of classical origin to conduct rainwater, composes the language of architecture.

Interestingly, the gargoyle has been studied little, as it is still considered a complement to the technical solution of rain installations. In this article, it is understood that the gargoyle is part of the composition, the importance of which lies in the reconciliation of technical and functional aspects with aesthetic and poetic aspects.

In order to study the problem of the design of the modern gargoyle, this article explored the varied geometries of this element proposed by the architect Le Corbusier and established relationships with the most significant gargoyle proposals in modern Brazilian architecture. During the research, we redrawn and produced digital models to investigate the geometry of the Corbusian and Brazilian gargoyles of the 1950s and 1960s.

Le Corbusier's gargoyles

Gargoyle is an important element in construction, as it is an integral part of the hydraulic system for the direction and drain of rainwater. A striking element, especially in Gothic architecture, highlighted by the architect Viollet-le-Duc (1854), the gargoyle included symbolic representations. However, in the twentieth century, there was a renewed interest in the design of the gargoyle, mainly from the designs of Le Corbusier.

The geometry of Le Corbusier's gargoyles, predominantly constituted by regular shapes (rectangular, trapezoidal, semicylindrical, for example), made water a visual phenomenon. In them, the waters are conducted from the cover to the ground by horizontal, inclined, and vertical paths in order to make visible the spectacle of the flow of rainwater.

The Oeuvre Complète (1935/1965) shows projects and realizations with various types of gargoyles. In the 1930s, Le Corbusier designed and built his first modern version of the gargoyle at the *Villa Sextant* (1935) (fig. 1). It is a straight geometry, rectangular gargoyle, in the format of "U," with the technical and functional character of capturing the rainwater from the roof type "butterfly" (inverted roof), also used in the project of the *Maison Jaoul* (1937), not built (fig. 1).

Corbusier's poetic gargoyle appears in 1950 with the *Chapelle Notre Dame du Haut* (1950-55), which captures the water from the curvilinear roof (fig. 2). In this chapel, Corbusier proposes a more expressive gargoyle, which represents the phase of greater lyricism in his work. This gargoyle becomes a fundamental part of plastic composition as a poetic and artistic element.

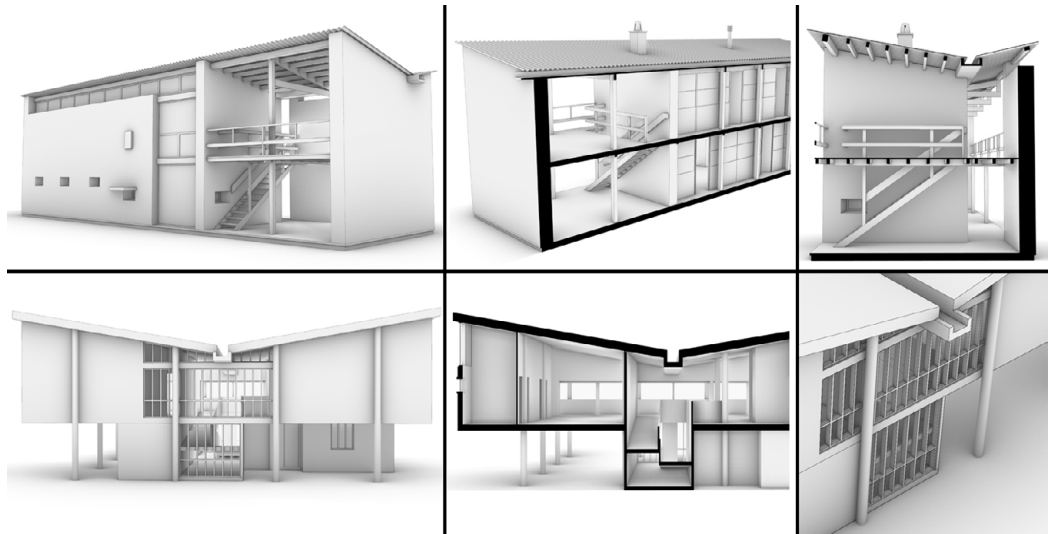


Fig. 1. Design of *Villa Sextant* (above) and *Maison Jaoul* (below). Elaboration by the authors (2023).

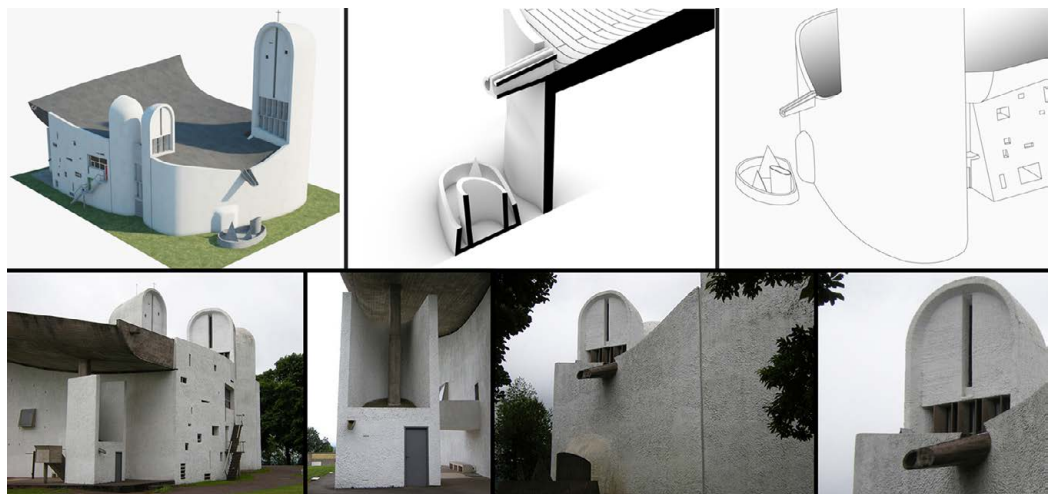


Fig. 2. Drawings and photos of the gargyle of the *Ronchamp Chapel*. Elaboration and photographs by the authors (2008/2022).

Positioned on opposite sides, the main gargyle has curvilinear geometry with a bifurcation, which leads the water to a sewage basin in the ground, while on the other side, a rectangular gargyle captures part of the water in the upper part. Innovatively, the gargyle is positioned on the west facade, and the water is poured into the “*bassin d'eau*” rain containing pyramidal geometric shapes and, below them, a cistern. It was during the 1950s that Corbusier produced most of his designs, which included gargyles. In the *Couvent Sainte-Marie de La Tourette* (1953-60), the gargyle has a rectangular geometry (fig. 4). In the institutional projects in Chandigarh (1950-65), India, the buildings of the *Haute Cour*, the *Secrétariat*, and the *Legislative Assembly* have gargyles that capture and conduct the waters from the roof. In *Villa Shodhan* (1951), there are many gargyles that capture the water from the roof and the flower trees on different floors (fig. 3), as well as in *Villa Sarabhai* (1955). In the latter, in addition to gargyles, there is also a ‘toboggan’ directing the water to the pool. In the *Maison du Brésil* (1952-59) (fig. 4), there are gargyles that capture the water that penetrates the terraces of the student residences building. They have curvilinear geometry with discrete dimensions. In Firminy, the *Maison de la Culture* (1960-65) and the *Église Saint Pierre* (1960-1969) clearly reveal, in their fullness, the poetic phase of Corbusier. In the *Maison de la Culture* (1953) (fig. 4), the architect creates two gargyles, positioned on opposite facades at the ends, whose circular geometry projects the water from the curvilinear roof.

But it is at the *Église Saint Pierre* (1960–2006) that Le Corbusier designed and built the most elaborate and complex rainwater route of his work. The rainwater that falls on the sloping roof and on the outer surfaces of the church is led to a sort of vertical conductor (fig. 5, in red) and poured into the streams that surround the building (fig. 5, in blue). Finally, all this water is led to a single gargyle, and, by gravity, all that water is concentrated and led to gargyles, which lead to a vertical descent, pouring the water into a collection basin into the ground (fig. 5, center). The rainwater path of the small *Bâtiments de l'Écluse* (1950–62), with its 'butterfly' roof (inverted roof), contains a diagonal stream that leads the water in both opposite directions, which descends a small ramp and then descends vertically until it reaches the ground (fig. 6).

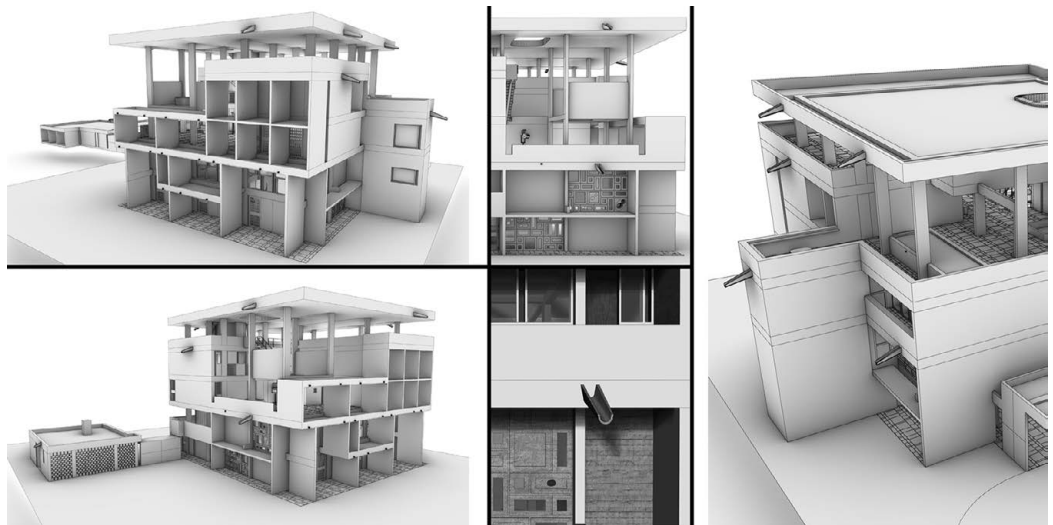


Fig. 3. Villa Shodhan, gargoyles on the four facades. Elaboration by the authors (2023).



Fig. 4. Gargoyles at the Couvent Sainte-Marie de La Tourette (above), Maison du Brésil (center), and Maison de la Culture (below). Photographs by the authors (2008/2016).

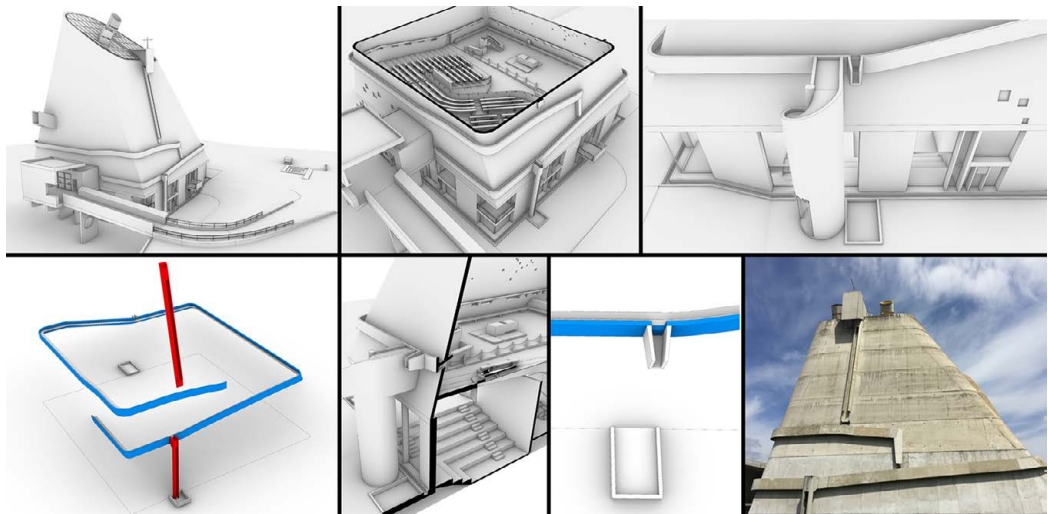


Fig. 5. *Église Saint Pierre*, water path. Elaboration and photographs by the authors (2016/2023).

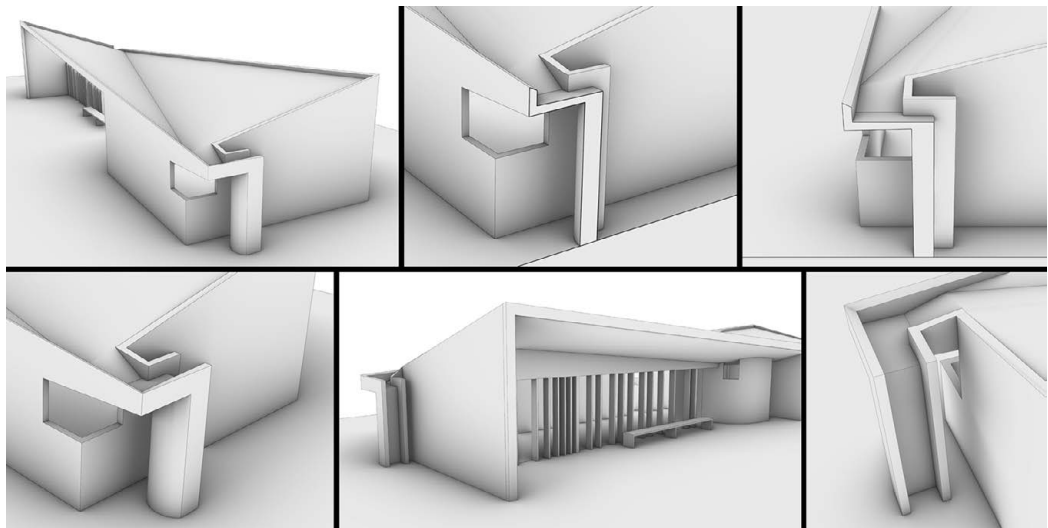


Fig. 6. *Bâtiments de l'Ecluse*, gargoyle with vertical water descent. Elaboration by the authors (2023).

The design of the *Gárgula* in Paulista modern architecture

In the Brazilian landscape of modern architecture, the great reference is Le Corbusier. Since 1950, we have noticed many designs and buildings built with gargoyles inspired by the Franco-Swiss master. With geometries that vary subtly, each architect followed the honesty and logic of modern architecture, both in its rational as well as functional and technical character. João Batista Vilanova Artigas (1915-1985) was one of the most important and influential Brazilian architects, considered the master of the so-called *Escola Paulista*. In his texts, such as *A Função Social do Arquiteto* (1989) and *Caminhos da Arquitetura* (1981), his professional position as a craft architect is evident, establishing relationships between architecture, technique, and construction.

In their designs, especially from the 1950s, we can observe a specific design for the gargoyle with trapezoidal geometry, both technical and functional, highlighting the structure and technique of armed concrete. One example is the *Ivo Viterito House* (1962-65) (fig. 7), whose vertical trapezoidal gargoyle conducts rainwater vertically.

In the context of modern Paulista architecture, we can observe architects such as Lina Bo Bardi, Rino Levi, Joaquim Guedes, Decio Tozzi, João Walter Toscano, and Carlos Milan, among others, who explored the modern design of the gargoyle.

Achilina di Enrico Bo (1914-1992) was one of the most important Brazilian architects of the 20th century. As a modern architect, Lina expressed her understanding of architecture as a structure with continuous and free spaces and forms.

The gargoyle appears in Lina's work in a functional and technical way, as an extension of the stream, directing the flow of rainwater rationally (fig. 8).

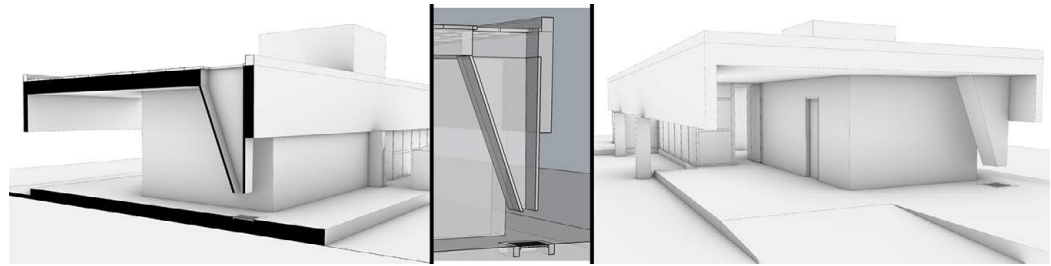


Fig. 7. Trapezoidal gargoyle of Ivo Viterito House created by Vilanova Artigas. Elaboration by the authors (2023).

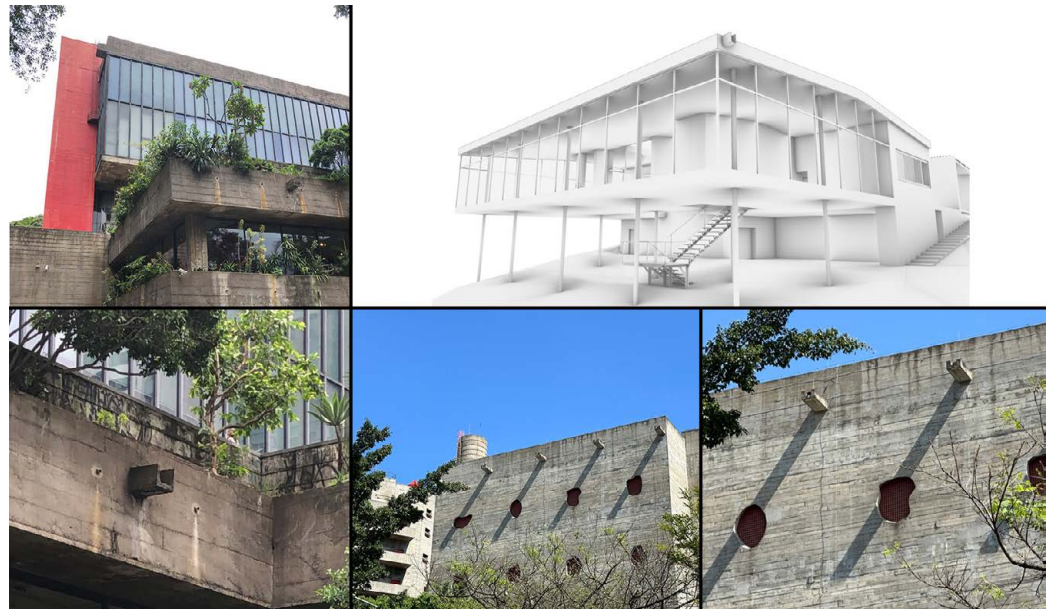


Fig. 8. Gargoyles do MASP de São Paulo (left); Lina Bo Bardi House (top right), and Sesc Pompeia (bottom right). Elaboration by the authors (2015/2022).

The paulista architect Joaquim Guedes (1932-2008) became known for his care in defining the constructive details. Guedes had an independent approach from the *Paulist School*, with the adoption of unusual geometric configurations. In *Cunha Lima House* (1958-1963) (fig. 9), we note the architect's creativity in defining a water route. The vertical gargoyle conducts the water collected from the roof and pours it into a pyramidal vessel, which in turn conducts water through a triangular prism below it, pouring the water into the ground. The gargoyle on the rear facade has a trapezoidal design (fig. 9, below right).

The architect Decio Tozzi (1936-) was part of a generation of the decade formed in the early 1960s. His investigative stance [Tozzi 2005, pp. 314] is noted in a set of works conceived in the 1960s. Its architecture turn around three concepts: light, space, and matter. The gargoyle of the *Romeu del Negro House* (1962-65) (fig. 10) is designed as a compositive, functional, and expressive element, reinforcing its aspirations to relate light and shadow in the architectural composition.

Fábio Penteadó (1929-2011) acted as an architect in the Plan of Action of the Government Carvalho Pinto (1959-1963) to design numerous public works throughout the state, concretizing Paulist modern architecture. With expressive conceptual content, its architecture

became known for the conceptualization of the 'Architecture of the Crowd' [Penteado 1998], which involves an understanding of modern architecture as urban, social, and democratic.

In the *Forum of Araras* (fig. 11), a "cascade" gargoyles on the main façade, with larger proportions than usual but that fits with the whole composition, spills the waters over the lawn into the ground.

In the *Palace of Justice* (1962) in Brasília, Oscar Niemeyer proposed an unusual element: a waterfall (fig. 11). It is not a gargoyles, but an element that explores the visual and sound qualities of the large amount of water that is poured into a water mirror, suitable for a dry climate like Brasília.

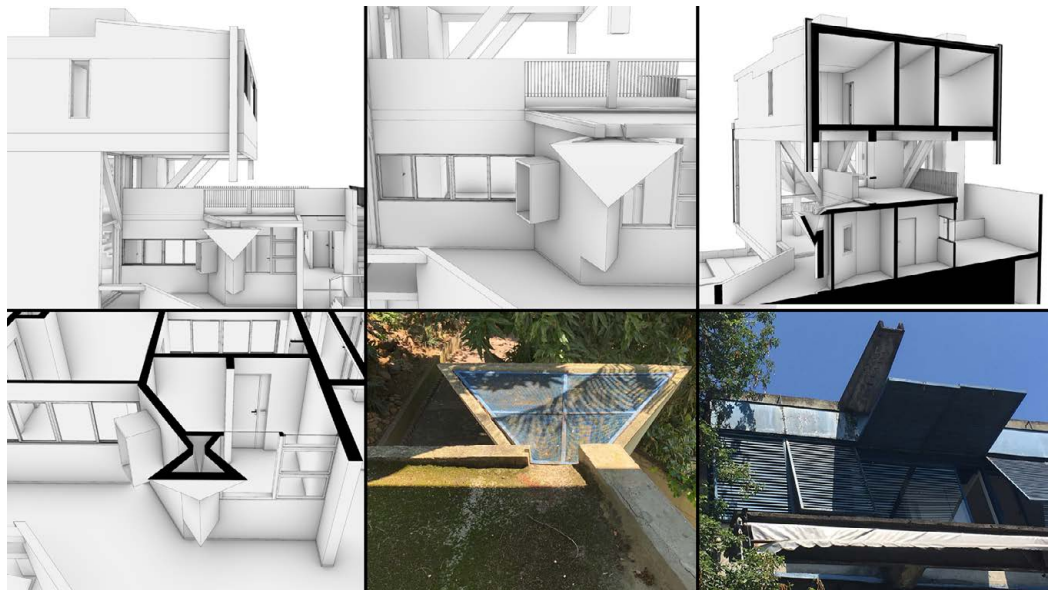


Fig. 9. Gargoyles of Cunha Lima House. Elaboration and photographs by the authors (2021).

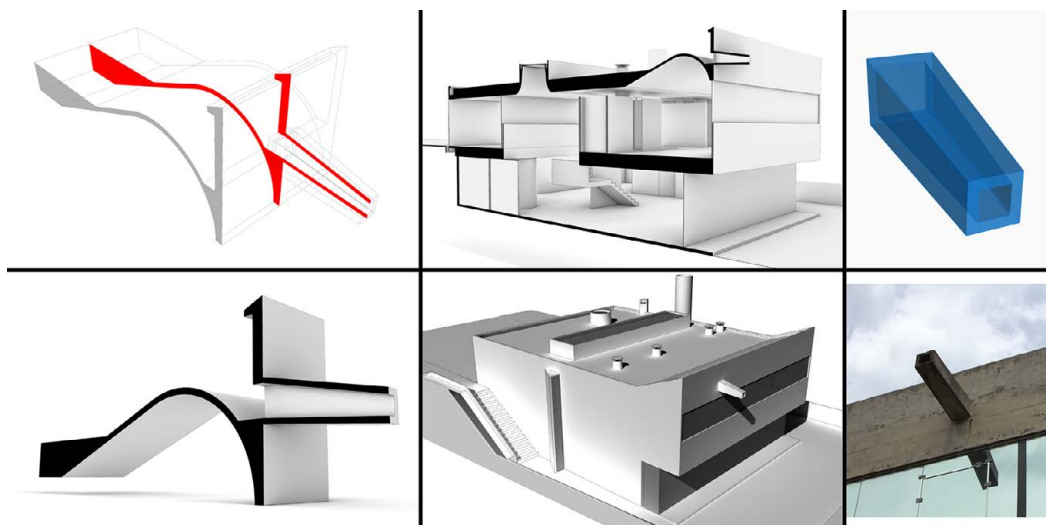


Fig. 10. Romeu del Negro's House gargoyles. Elaboration and photographs by the authors (2021).



Fig. 11. Gargoyle of the *Forum of Araras* (above) and *Waterfall of the Palace of Justice* (below). Photographs by Leticia Bortolo Martins (above) (2022), and by the authors (below) (2014).

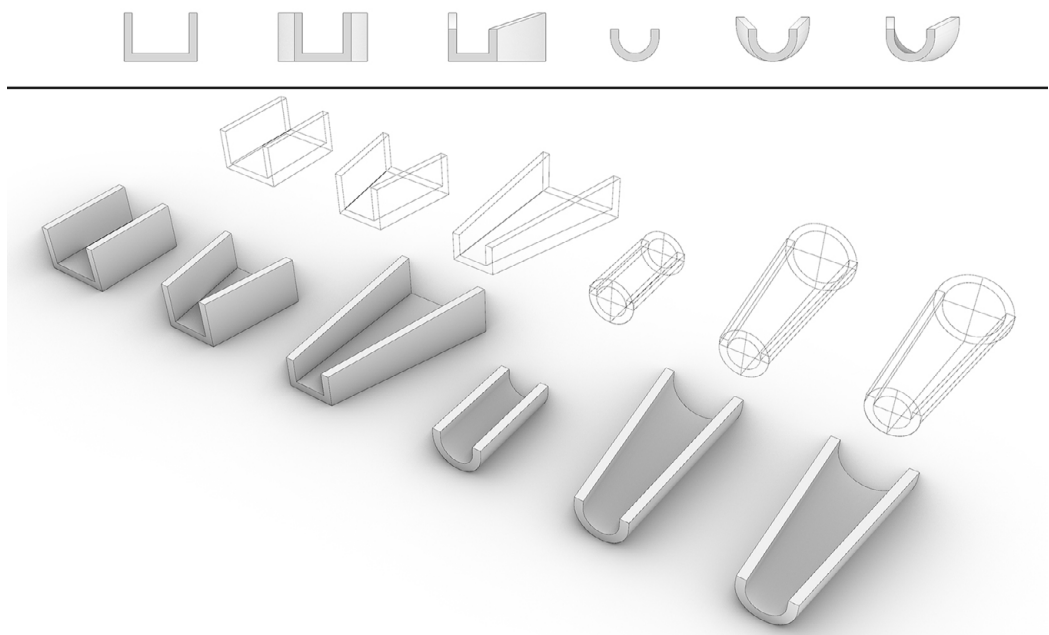


Fig. 12. Geometry of the most common gargoyles in modern Brazilian Architecture. Elaboration by the authors (2023).

Conclusions

It was in South America (1929-1936) and North Africa (1928-1932) that Le Corbusier perceived the violence of tropical and Ecuadorean waters, respectively. The heavy rains and storms present on their boat trips also contributed to the importance of the rapid flow of violent waters. Soon the architect realized that the transatlantic scuppers performed the role of Gothic gargoyles.

The design of the Corbusian gargoyle has been transformed into three stages. The first is the technical and functional gargle of the 1930s. The second is the poetic, curvilinear gargle of the 1950s.

The third is the sculptural gargoyle from the 1960s, which has larger water paths, from capture to descent to the ground. The poetic dimension of Le Corbusier's work can be appreciated in his projects from the 1930s, but it reached its peak in the 1950s.

We can draw the conclusion that Corbusier's idea for a modern gargoyle is honest and coherent in terms of architectural principles today. An element that fulfills its technical function and has a clean and austere design as an extension of the canopy itself. However, the poet Gaston Bachelard also emphasizes other aspects of water:

"We would never finish looking for all the words of common derivation in the imaginary phonics of the waters if we listened to the trumpets and the rays, if we studied together the screams and caricatures of the gargoyle. To spit the storm as an insult, to vomit the guttural injury of the water; it would be necessary to attach to the drip monstrous shapes, sloppy, kissed, crooked, and scratched. The gargoyle plays indefinitely with the flood." [1] [Bachelard 2002, pp. 198].

On the one hand, the water calms, which runs and provides fugitive images, becoming a transitory element that drives thought and imagination everywhere. On the other side, there is that quiet water, which sounds like the landscape but takes on a kind of cholera during storms.

The gargle element makes visible and honest the drama of the violent waters of a storm. Strong, torrential rains generate a stream of water that runs through the gargoyle. By draining and cleaning the water clearly and quickly, the gargoyle becomes a functional, constructive element that is at the same time technical and poetic. Moreover, the sound of water that runs or slides slowly through the gargoyle stimulates our imagination.

Modern architects contributed to giving a drawing to the gargoyle. The geometry of this element defines the flow of water, its direction and intensity, and, in particular, how water will flow, spill, and be thrown into space. Thus, the configurations of the gargoyle, its shape, and its dimensions provided a new opportunity for modern architects to solve a problem that is technical, functional, and aesthetic.

Modern architects in Brazil participated in this challenge. With innovative proposals, a set of Brazilian architects explored the architectural element 'gargoyle' to make visible a phenomenon of nature. The gargoyle makes the water the agent of a spectacle of nature and represents for the architect the intense desire to make visible the invisible.

Notes

[1] Translated by the author.

References

- Batista Vilanova J.A. (1989). *A função social do arquiteto*. São Paulo: Nobel/Fundação Vilanova Artigas.
- Batista Vilanova J.A. (1981). *Caminhos da arquitetura*. São Paulo: Lech.
- Bachelard G. (2002). *A água e os Sonhos*. São Paulo: Martins Fontes.
- Le Corbusier; Boesiger W. (1936/1965). *Le Corbusier et Pierre Jeanneret. Oeuvre Complète*. Zurich: Lés Éditions D'Architecture.
- Penteadó F.M. (1998). *Fábio Penteadó: ensaios de arquitetura*. São Paulo: Empresa das artes.
- Tozzi D. (2005). *Arquiteto Decio Tozzi*. São Paulo: D'Auria.
- Viollot-le-Duc E. (1854). *Dictionnaire raisonné de l'architecture française du XIe au XVIe siècle*. Paris: Bance et Morel.

Authors

Wilson Florio, University of Campinas, wilsonflorio@gmail.com
Ana Tagliari, University of Campinas, tagliari.ana@gmail.com

To cite this chapter: Wilson Florio, Ana Tagliari (2024). The design of the gargoyle in modern architecture. In Bergamo F., Calandriello A., Ciammaichella M., Friso I., Gay F., Liva G., Monteleone C. (Eds.). *Misura / Dismisura. Atti del 45° Convegno Internazionale dei Docenti delle Discipline della Rappresentazione / Measure / Out of Measure. Transitions. Proceedings of the 45th International Conference of Representation Disciplines Teachers*. Milano: FrancoAngeli, pp. 2875-2884.