Le Corbusier, Rio de Janeiro, Topography and Housing: A Cross-Cultural Exchange

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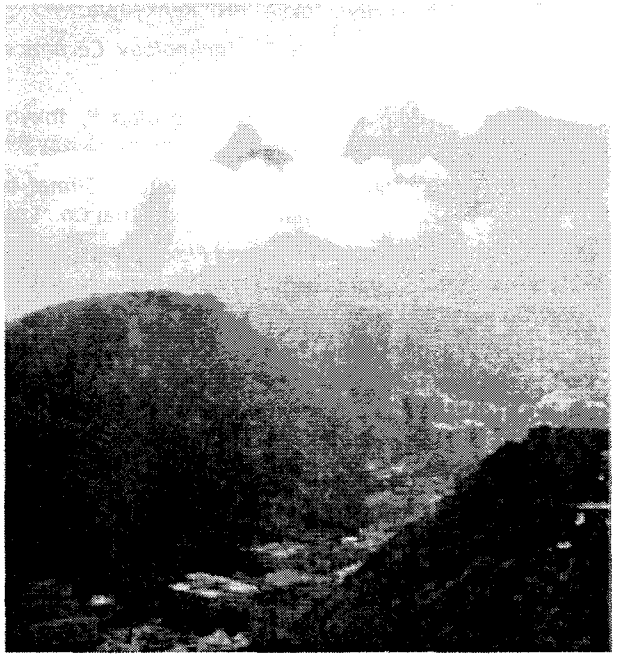
The prevailing critical consensus on Brazilian Modernism holds that from 1929 through the1960s, an exotic regional variant of modernism flowered as theory emanating from centers of high culture in Europe was adapted to lush tropical landscapes. Leonardo Benevolo **(1)** (Benevolo, 1971) regards the Brazilian context as a new source of opportunity for Modern Movement theory after World War II, when architectural production in Brazil was no longer linked to European or American models and thus able to support experiments underway in the Old World and the New. Benevolo's account is typical for its lack of interest in any reciprocal influence exerted by South American culture before or after the War, and for its assumption that modern architecture was advanced solely by other modern architecture. By examining the multiple and complex ways in which architectural ideas develop, this paper amplifies the theme of encounter between two worlds: the influence of dramatic New World topography and infrastructure on the work of Le Corbusier, arguably the Modern Movement's most influential architect, whose purist formal vocabulary of white machine-like forms was infused with a more organic, lyrical expression after a tour of South America in the late 1920s; and the delayed impact of unbuilt urban proposals Le Corbusier developed during his first visit to Rio de Janeiro on a new generation of Brazilian architects twenty some years later.

Unlike the Spanish conquistadores who controlled the rest of South America, the Portuguese colonizers of Brazil were more interested in establishing trading outposts that in imposing a new political, social and religious order. In contrast to the abstract geometrical forms and rigid hierarchical organization of the grid and plaza towns imposed by their Spanish counterparts, the Portuguese settlements were characterized by functional relationships and adaptation to local topography. **(FIG.1)** By 1891 the colonial city of Rio de Janeiro had become a destination for both internal and foreign immigration;



with a population of around 500,000 and growing, it ranked among the world's largest cities. The surrounding hills left only a narrow sliver of flat swampy land for development, and the relentless pressure to expand required a series of major public works projects. During the last decades of the nineteenth century and the early part of the twentieth, tunnels were dug, hills demolished and land reclaimed from Guanabara Bay. The desire to project a progressive image abroad triggered another series of urban revisions inspired by Hausmann's Paris, including construction of broad avenues, straightening and widening of existing streets and the demolition of slums that interfered with the desired civic imagery. An extensive urban renewal program launched in 1922 resulted in the destruction of Morro do Castelo (Castle Hill), Rio's decaying birthplace, and the site of its oldest urban fabric. The spoils were used to build Avenida Beira Mar, an elegant coastal boulevard, and to provide enough flat land for the Centennial Exposition of 1922, celebrating

one hundred years of Brazilian independence from Portugal. The exposition featured specially designed buildings in a neo-colonial style to present a new and authentically Brazilian architectural face to the world. Significantly, it was the reclamation areas around Guanabara Bay, which became the face of Rio de Janeiro and the whole of Brazil, because they were the first parts of the city seen from arriving ships.

In 1930, at the invitation of the mayor, the French urban planner Alfred Agache devised a master plan which would have imposed a European neo-classical order thought to be more suited to an aspiring national capital than the looser, more organic morphology of previous undertakings. In the manner of Baron Hausmann, Agache's plan would have removed economically, socially and racially undesirable elements from Rio's most visible neighborhoods. **(2)** (Sisson 1995) After a change of political power, Agache's plan was abandoned and with the new government an opportunity was created to impose a new, socially progressive, technologically innovative architecture. Unlike the abstract monumentality that had been proposed by Agache, the new architecture would be more responsive to the existing topography and consistent with the traditions of Portuguese colonial urbanism. Modernism would achieve dominance as the new political administration's public building program was implemented, including the design and construction of housing for the underprivileged. The new generation of urban planners and architects in Rio de Janeiro managed to shift the discourse away from the aesthetics of design to the ethics of building. (Calvacanti 2003)**(3)** The new approach to planning was evident in the urban renewal scheme for Rio proposed by Le Corbusier in 1929 **(FIG. 2)** and given credibility later that year when the Ministry of Education and Health was completed, the first significant modernist building in Latin America.

During Le Corbusier's first visit to South America from September through December, 1929, his airplane trips over the continent prompted the creation of large urban proposals for Buenos Aires, Montevideo, São Paulo and Rio de Janeiro. In their responsiveness to the local topography these schemes marked a significant departure from the machine-like forms and clear distinctions between landscape and built form that had characterized his previous work. But it was his proposal for Rio, inspired by the landscape of spectacular hills and the

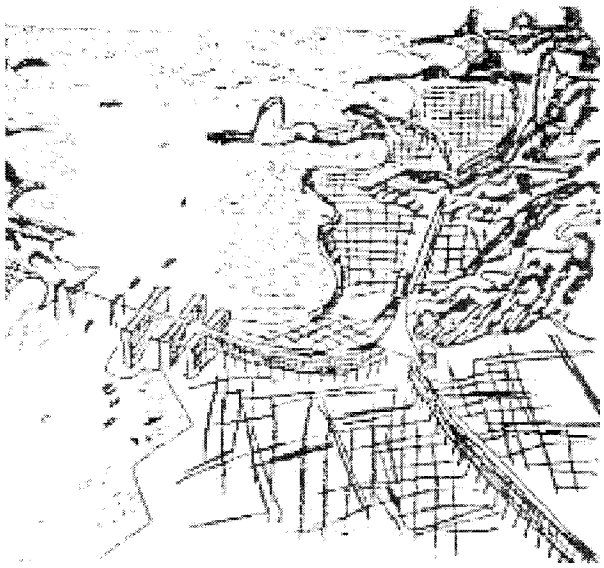


Fig. 2 Le Corbusier. Sketch proposal for Rio 1929 in Lauro Calvacanti. When Brazil was Modern. Guide to Architecture 1928-1960. (New York: Princeton Architectural Press, 2003) p. 16.

exuberant topography - Sugar Loaf Mountain, the Corcovado, Gavea and the Gigante Tendido - that marked the strongest departure from his previous designs. "From out at sea, I saw in my mind the ample and magnificent line of buildings, crowned horizontally by the highway striking from hill to hill and stretching hands from one bay to the next." **(4)** (Le Corbusier, 1991) The most famous of his sketches from 1932 shows a viaduct-like structure with offices and apartments underneath winding through the hills surrounding Rio in which the grid-like infrastructure of the existing city was relegated to an abstract background texture. Le Corbusier's monumental vision eliminated such traditional features of urban design as the division of land into smaller individually-owned parcels in favor of a unified composition that combined buildings, landscape and infrastructure into a synthetic whole.

When compared with the long-domesticated landscapes of most parts of Europe, the hilly terrain of eastern South America had a primitive sensuous character that appealed to Le Corbusier; he referred to these landscapes as "violent and sublime", "something to inspire the work of man ... to exalt his courage to provoke creative acts." **(5)** (Le Corbusier, 1991) Their wildness exuded an explosive power he interpreted as a metaphor for the creation of the whole of the New World. In the hills Le Corbusier

perceived both a backdrop against which a new order could be established and landforms which were themselves an expression of joy, as if the hills themselves were at once outbursts of pleasure and datums for the establishment a new civilization. "You in South America are in a country both old and young; you are young nations and your race is old. Your destiny is to act now. Will you act under the despotic dark sign of hard labor? No, I hope you will act as Latins who know how to order, to regulate, to rule, to estimate, to measure, to judge and to smile." **(6)** (Le Corbusier, 1991)

Le Corbusier's sketch scheme proposal for Rio de Janeiro, a serpentine viaduct supported by housing on pilotis spanning the coastal hills, exemplifies the transformation in his work that was taking place at the end of the 1920s and the beginning of the 1930s. By his own account Rio's landscape of undulating hills and curving shorelines cast a magic spell, but it also inspired a new urban formal aesthetic.

Spanning between the sensuous curves of the Santa Thereza and Santo Antonio hills was the monumental Aqueduto da Carioca also called the Arcos da Lapa, built in the 1750s and one of the few surviving landmarks from the colonial era. Originally the aqueduct carried water from the Santa Thereza to the city but in the 1890s it was converted to serve as a bridge for the new electric streetcars (bonde) that were replacing the animal-powered ones. In both form and function, the striking 800-foot aqueduct has an unmistakable resemblance to Le Corbusier's viaduct, also intended to span between the hills in Rio de Janeiro **(FIG. 3)** The Aqueduto da Carioca is a landmark no tourist in Rio de Janeiro can miss, particularly one who has flown over it as Le Corbusier had done. Curiously, in light of the fact that it had been among the most conspicuous built forms in the landscape of Rio for centuries, the aqueduct appears nowhere among the many powerful sketches he made of the city, its topography and people, but Le Corbusier was notorious for the selective editing of publications about his work.

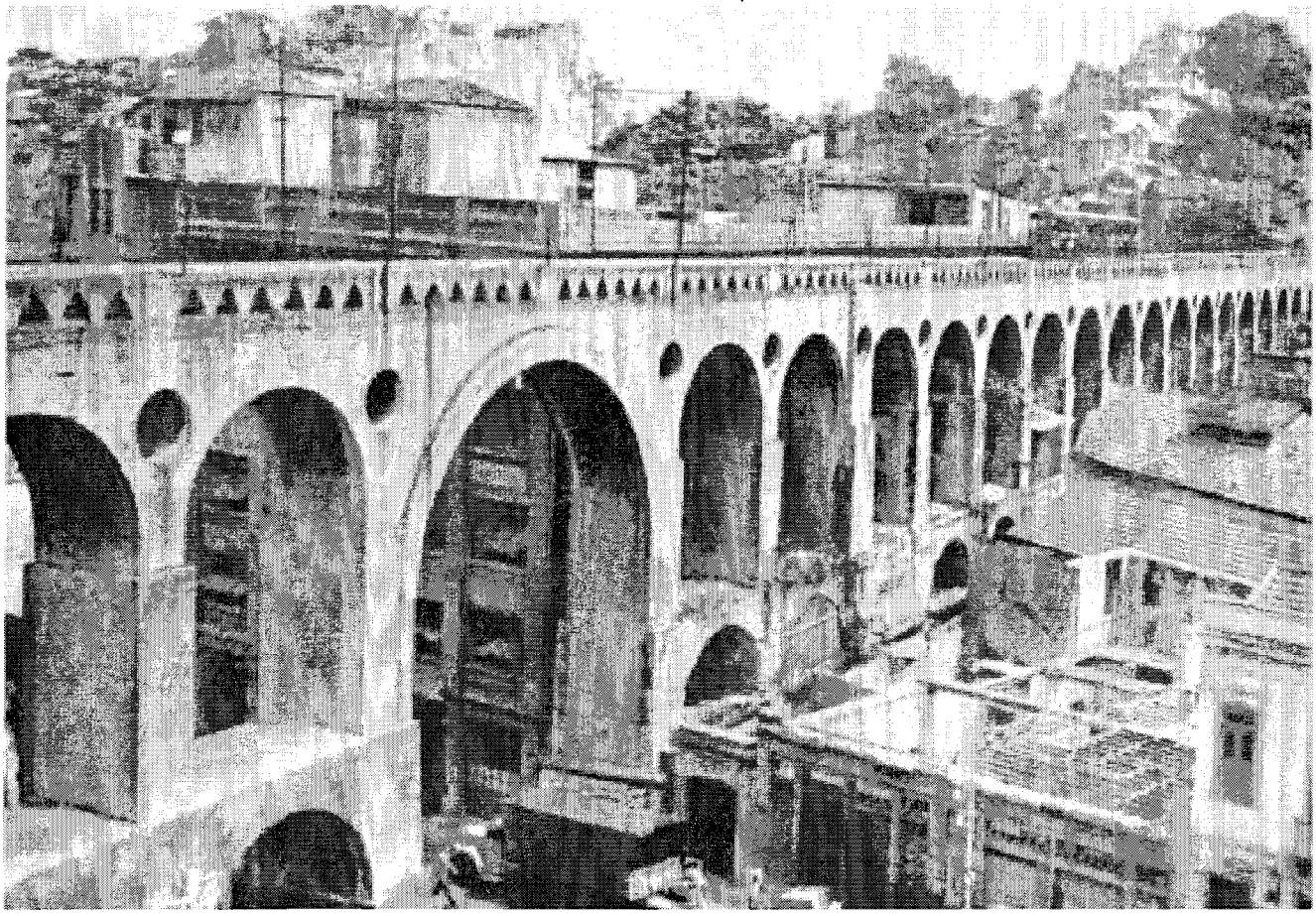


Fig. 3 Aqueduto da Carioca, Rio de Janeiro. Courtesy of the Author.

By showing both an inclination to adapt built form to the contours of the terrain and a desire to celebrate the landscape, Le Corbusier's urban sketch plan for Rio stood in marked contrast to his earlier Cartesian, proposals intended for universal application such as Une Ville Contemporaine (1922) or the Plan Voisin for Paris (1925), and anticipated the development of the Obus Plan (1930), a proposal for Algiers whose forms closely resembled those of the sketch plan for Rio. Influenced by contemporary intellectual fashions such as syndicalism, which promoted the attainment of that which was natural or organic to man, the Obus Plan put forward the concept of adaptability not only as applied to the landscape but extended it to include the notion of the individual building as a framework within which people could define their own identities. (7) (McLeod 1980)

The first sign of the impact of his South American visit on Le Corbusier's built work can be seen in his student housing project at Cité Universitaire (later the Université Paris), the Pavillon Suisse (1932), which can also be understood as an exploration and demonstration of the principles of urbanism. Although built in a very different context to the one he had encountered in Rio, the residential slab on pilotis can be perceived as a fragment of a viaduct. The communal areas are located on the ground floor and the student rooms contained in a glazed slab lifted above the ground on pilotis. Oriented towards the sun to insure a healthful living environment, the rectilinear residential slab contrasts with the curving forms of the entry and communal areas on the ground floor. Whereas the curves present in his previous buildings were geometrically precise, the walls and stair of entrance lobby at the Pavillon Suisse have a fluid, sensual quality. As if attempting to reinforce the fusion of topography and architecture, the communal area also features a photographic mural with a collage of abstract landforms. While Le Corbusier had used curvilinear forms before, in the League of Nations project (1927) and the Palais du Centrosoyus in Moscow (1929), those of the Pavillon Suisse have a biomorphic quality also present in the paintings and murals on the ground floor reception areas. The curving wall is made of rubble stone, a reflection of Le Corbusier's increasing preoccupation with vernacular building materials and nature. In the Pavillion Suisse Le Corbusier abandoned the finish coat of white plaster applied in his earlier work and for the first time left the bare reinforced concrete with impressions from the formwork clearly exposed; stone panels, another natural material, were used on the end walls. The top floor features a solarium that provides yet another link to the natural environment and the sky. The changes in his architectural production emerged at the same time the female figure and other natural forms appeared in his painting as objets a reaction poetique (objects of poetic reaction) to be distinguished from the objets-types (object types) of his earlier compositions.

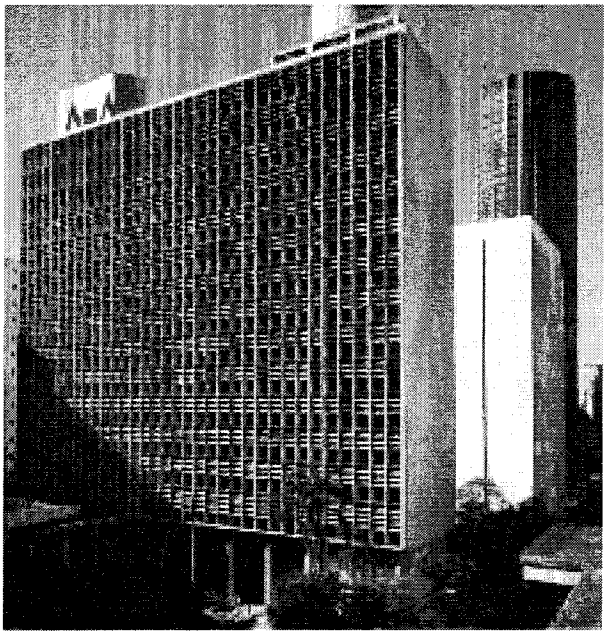


Fig. 4 Ministry of Education and Health in Arquitetura Brasil 500 anos. (Recife:Universidade Federal de Pernambuco, 2002.)p. 191.

Rio de Janeiro as imagined by Le Corbusier was never built but his plans materialized, at least in part, in the work of Brazilian architect Affonso Eduardo Reidy. Born in 1909 to an Irish father and a Brazilian mother, Reidy was a student at the at the National School for Fine Arts in Rio when Le Corbusier came to visit in 1929 and like many other young Brazilian architects, was deeply inspired by the European master's visions for Rio's future; he graduated just as the new government came to power in 1930, initiating a wave of political, social and industrial change. In 1932, Reidy became an employee of the Federal District Government (Distrito Federal) where he would remain until shortly before his death in 1964 at the age of fifty-five. In 1932, he was invited to join the team responsible

for the design of the Ministry of Education building in Rio, headed by Lucio Costa with Le Corbusier as a consultant. **(FIG. 4)** The experience of designing the Ministry building was a life-changing episode for the young Reidy, transforming his ideas about urban space and the potential of architectural form to shape human experience. **(8)** (Instituto Lina Bo e P.M. Bardi 2000) As a public employee, Reidy had the opportunity to work on important civic commissions such as schools, police stations and even a city hall building, but it was the Pedregulho Housing development, built in the outskirts of Rio between 1949 and 1951, that brought him to international prominence. Carmen Portinho, Director of the Department of Popular Housing in Rio, an engineer and Reidy's wife, initiated the Pedregulho, a new model housing development for municipal workers who

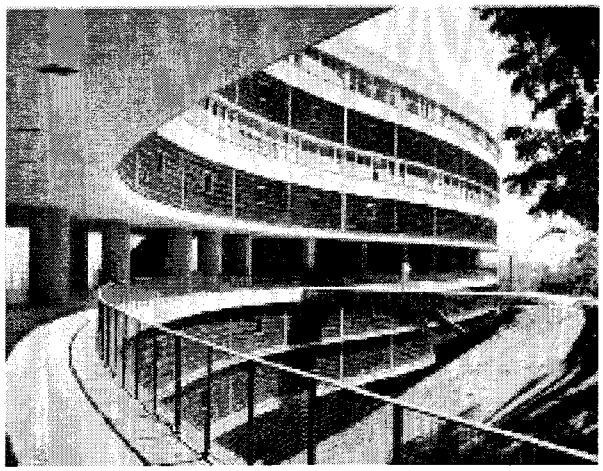


Fig. 5 Pedregulho in Affonso Eduardo Reidy- Bauten und Projekte, (Stuttgart: Verlag Gerd Hatje,1960).

could afford the direct deduction from their wages. Portinho proceeded to appoint her husband as the chief architect for the project, effectively enabling him to design it. **(FIG. 5)**

Located in close proximity to an industrial area of Rio, the Pedregulho housing development covers an area of nearly thirteen acres and is comprised of four apartment blocks, an elementary school, a gymnasium, a swimming pool with dressing rooms, a health center, playgrounds, a laundry and a day-care center. The facilities were located in several different building types, the most prominent of which is a roughly 850 foot-long serpentine block with 272 apartments sited on a hill overlooking the rest of the complex with distant views of Guanabara Bay. Two other apartment buildings, both 262 feet long, are located below the serpentine form, and a fourth slab was never built. Reidy chose to use rectangular sections for the residential buildings, trapezoidal sections for the service buildings and arches for the gymnasium and swimming pool. The complex housed 478 families in apartments of various sizes, from efficiencies to duplexes with four bedrooms. The streets connecting the various buildings were reserved for pedestrians and the Pedregulho gardens were designed by Roberto Burle-Marx, the renowned Brazilian landscape architect. **(9)** (Calvacanti 2003) The main serpentine block, a seven-story building without elevators, was structured so that the third floor became a sort of interior street with four floors of residential units above and two below, making the installation of expensive elevators unnecessary. By locating the main entrance on that floor Reidy combined an interesting formal device with an effective strategy to reduce the cost of the building. The decision also enhanced the building's formal appeal by avoiding the visual monotony which would have resulted had six stories of apartments been stacked one on top of the other. The third floor was designed as a mainly open space so that it could be used as a covered playground, but it also contained the administrative offices, social services, a nursery, kindergarten and at the far end, an acoustic shell that functioned as a children's theater. Three main staircase systems connected the open floor to the other floors. Another design decision that had both an ideological and economic inspiration was the use of pilotis on the ground floor, one of Le Corbusier's "Five Points" of architecture that in this case also eliminated the necessity for expensive retaining walls.

Reidy designed another housing scheme in the Gavea neighborhood of Rio de Janeiro, the Conjunto Residential Marques de São Vincente (1952), which followed a similar formal strategy but included such compositional and structural flourishes as a distinctive roof-top canopy, "V" shaped columns that added a decorative motif on the third floor and a greater variety of window shapes. **(10)** (Bruand 2002). **(FIG. 6)** One of the most important differences between the Conjunto Residential Marques de São Vincente and the Pedregulho was the way in which each project framed the surrounding landscape. The scheme in Gavea was built above a small lagoon, the Lagoa da Freitas, and established a datum line that framed the hill behind it. The Pedregulho scheme offered views of Guanabara Bay and embraced its

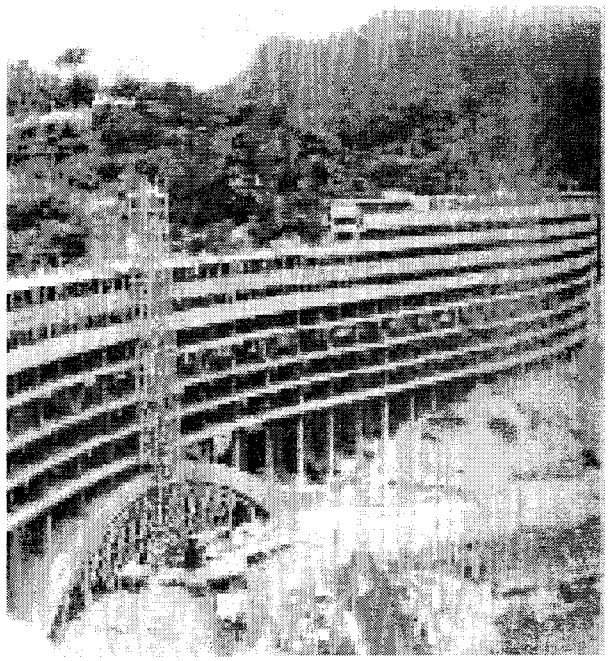


Fig. 6 Conjunto Residencial Marques de São Vicente in Affonso Reidy, Brazilian Architects. (Lisboa: Editorial Blau. 2000)

own hill as an integral part of the composition. Reidy designed a third serpentine housing scheme in 1951, the Catacumbas Housing Development, also located on the shore of the Lagoa da Freitas, to house shanty-town dwellers who had previously lived on the land where the Conjunto Residential Marques de São Vincente was eventually built, but the project was never executed. Transcending their functions as housing developments, the Pedregulho, Gavea and Catacumbas projects all resemble aqueducts and retain characteristics typical of Portuguese colonial urbanism. Elsewhere in South America, the uniformity mandated by the Spanish Laws of the Indies imposed a rigid urban grid that was intended to be inflexible and unrelated to the immediate context. The designs of Portuguese colonial settlements tended to be both pragmatic and responsive to their surroundings and these qualities are also characteristic of Reidy's housing projects.

Despite Reidy's claims **(11)** (Bruand, 2002) that his schemes were indebted to John Wood the Elder's design for the Royal Crescent, Bath (1767-74) and Alvar Aalto's Baker House student residence at MIT (1947-49), they most closely resemble Le Corbusier's urban proposals for Rio de Janeiro. Both projects also bear a strong sectional resemblance to the Unité d'Habitation at Marseille that Le Corbusier had designed in 1946, three years before Pedregulho was conceived. Both Pedregulho and the Unité were built on pilotis and featured a public space located roughly in center of the section. To a lesser extent, some aspects of these schemes appear to be derived from Oscar Niemeyer's free-form modernist projects in Pampulha, Minas Gerais such as the dressing rooms that resemble Niemeyer's Church of St Francis of Assisi (1943) and the primary school that recalls the Yacht Club (1942). Even before the Pedregulho complex was completed, it was greeted with enthusiastic approval. Max Bill, the Swiss artist and architect known in Brazil as the founder of the "Concrete" movement, claimed that he wished to live in a Pedregulho apartment. Walter Gropius, according to his wife's notes, was "in love" with the building, stating that it was "a model not only for Brazil but for the world." Siegfried Giedion judged Pedregulho the winner of the First International Biennial of São Paulo in 1953, writing that it was a simple example of how every city should be built. (Jovanovic Weiss and von Fischer 2002). **(12)** Like some European proposals for post-war reconstruction, the Pedregulho was intended as a social experiment and a model of Brazilian social reform for the world. Otherwise eligible families were thoroughly checked for communicable diseases before they were allowed to occupy their units. An additional requirement compelled the tenants to declare their willingness to preserve the pure white appearance of the building. To ensure their compliance, residents had to allow periodic inspections by Municipal Workers Housing Department officials to confirm that they were abiding by the regulations; they could be evicted if the information provided by the inspectors proved otherwise. **(13)** (Jovanovic Weiss and von Fischer 2002.) Residents were also expected to practice personal cleanliness and to keep the premises sparkling, particularly the communal laundry room and washing machines. To encourage its use, each family was given two kilos of laundry detergent annually as a gift from the city and allowed to wash four pounds of laundry per person per week. The laundry room and some apartments of selected residents were part of a regular tour conducted for VIPs, such as Aloisio de Paula, then director of the Museum of Modern Art in Rio. Thus both the architecture and residents of Pedregulho served as a demonstration project, living proof that Brazil was becoming a modern, technologically advanced society. (Jovanovic Weiss von Fischer 2002.) **(14)**

The social experiment failed, however. According to Calvacanti "the desire to improve the poor by placing them in sophisticated residential spaces clashed with the architects' ignorance of the taste and social skills of the inhabitants. In attempting to give women more free time and prevent them from hanging clothes from the windows, the architects eliminated washtubs from the apartments and provided only the laundry for washing clothes. For women of humble means washing clothes provided a social occasion." Lacking any other substitute for this opportunity to socialize, the women washed their clothes together in the almost Olympic-size swimming pool, instead of the laundry. **(15)** (Calvacanti 2003) But even if the social engineering was misguided, the architecture of Pedregulho achieved an inspiring synthesis of landscape, infrastructure and dwellings which became, at least in part, a realization of the visionary unbuilt scheme for Rio de Janeiro first imagined by Le Corbusier twenty-five years earlier.

Pedregulho and the Gavea project were both conceived at a time when Le Corbusier's own hillside housing projects were becoming less monumental and adopted a strategy bound much closer to the more organic urban traditions he had encountered in Rio de Janeiro: both the Le Sainte-Baume (1948) and "Roq" et "Rob" at Cap Martin (1949) embrace their hillside sites (FIG. 7) rather establishing

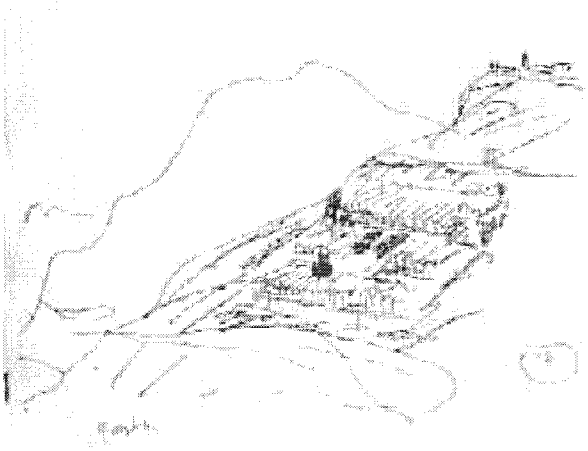


Fig. 7 Le Corbusier, Roq et Rob Cap Martin.1949 in Le Corbusier. (Zurich: Artemis 1973)99

identities as independent object while simulating the contours of the topography, as had the buildings included in the urban proposals for Rio. The hillside proposals from the late 1940s were dense aggregations of individual units grouped together to avoid the spoiling the landscape and to maintain good views of the ocean. (16) (Le Corbusier 1953) In adopting a more traditional approach to building on hillsides, Le Corbusier abandoned the monumentality of his earlier urban visions but continued to draw inspiration from his encounter with the South American landscape.

The Eglise Saint-Pierre (1960) was designed for Firminy-Vert, a mining, steel and textile town lo-

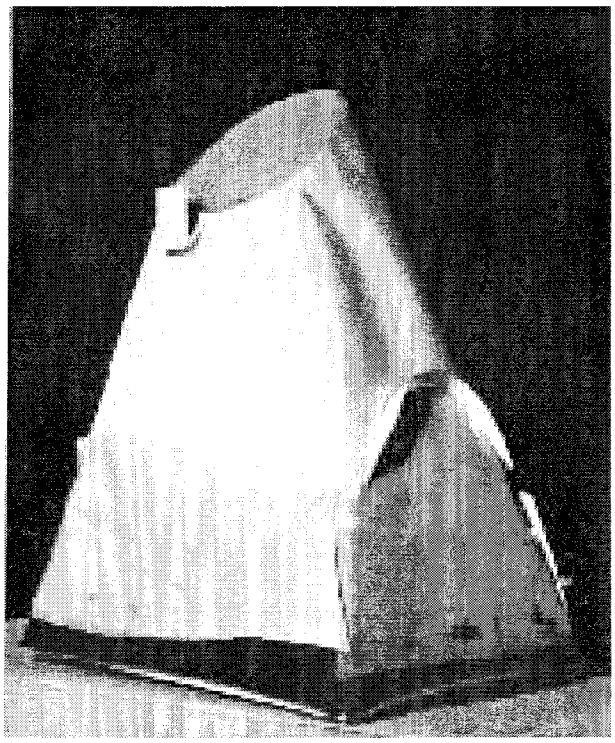


Fig. 8 Le Corbusier. Saint-Pierre, Firminy-Vert in Le Corbusier, Oeuvre Complete 1957-1965, (Zurich: Artemis 1995) 13

cated at the bottom of a valley fifty miles southeast of Lyon. The design (FIG. 8) contains the figure of an isolated mountain in the landscape, a form that Le Corbusier found particularly compelling and magnetic, one he sketched repeatedly during the late 1920s and early 1930s as one of his "objects a reaction poetique", like shells found on the seashore, or a beef bone recovered from the butcher's meat room. Sugar Loaf Mountain retained its totemic status, taking on human qualities and superhuman attributes in dozens of sketches as it had in every sketch for Rio de Janeiro for which Le Corbusier could find a pretext. **(17)** (Frampton 1981) **(FIG.**

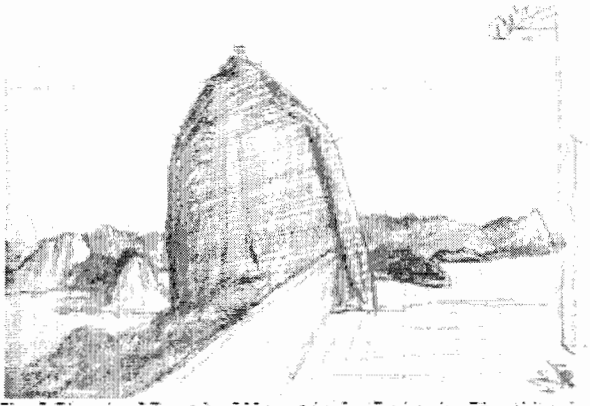


Fig. 9 Sketch of Sugarloaf Mountain in Le Corbusier Sketchbooks, 1914-1948 (Cambridge: The MIT Press, 1981)279

9) Described by Le Corbusier as a "hyperbolic-paraboloid shell and, a third new type of church", after Ronchamp and La Tourette, the design of the building simultaneously evokes a cooling tower and Sugarloaf, the magic mountain, **(18)** as does the roof of the Assembly Palace at Chandighar, designed in 1952 and completed in 1962. The very modern Cathedral of São Sebastião in Rio (FIG. 10) strongly resembles both buildings; it was designed by Edgar Oliveira da Fonseca, who would have been familiar with the work of Le Corbusier from articles in European architecture magazines then widely read by the eurocentric elites of South America. The Cathedral of São Sebastião returned Le Corbusier's metaphor of the magic mountain to its place of origin, ironically to the place where Morro (hill) de Santo Antonio and one of Rio's the earliest colonial settlements once, stood. The construction of the cathedral contained both the metaphor of Sugarloaf the magic mountain as transformed by Le Corbusier and expressed in his architecture, and the cathedral as the reincarnation of a previously demolished hill reborn on the same site. **(19)**

CONCLUSION

The hills of Rio, their sensuous forms curving along the Atlantic coast, made a powerful impression on Le Corbusier, inspiring him to develop a new urban aesthetic. Among the additional likely sources of inspiration were the female figure, natural objects such as sea shells, and the massive eight-hundred foot long Aqueduto da Carioca, a striking monumental former aqueduct which now functions as a viaduct, connecting the downtown area to the Santa Thereza neighborhood to the downtown area, as it has since the 1890s, well before Le Corbusier's visit to Rio in 1929. His first work to be built after returning from South America, the Pavillon Suisse, revealed in its curvilinear forms and use of raw materials, the impact of his experience in the New World on his architecture.

Le Corbusier's proposals for Rio remained unbuilt but twenty years later his schemes provided an important source of inspiration for Affonso Reidy's housing complexes, two of which were built. As prominent and visible architectural landmarks, both the Pedregulho and the Conjunto Residential Marques de São Vincente projected and advertised the promise of a new more equitable and technologically advanced Brazilian society. Thirty years later Le Corbusier's Eglise Saint-Pierre at Firminy-Vert was inspired by the form of Sugar Loaf Mountain which then inspired Fonseca's Cathedral de São Sebastiao in Rio, expanding the intercontinental dialogue about topography, infrastructure and architectural form, and enriching the creative exchanges between two cultures. The game of referential counterpoint also revealed the existence of a more subtle and complex dynamic than is implied by the construct of master architect and third world disciples.

The reciprocal relationships involving Le Corbusier, housing, Rio de Janeiro and several generations of Brazilian architects are difficult to untangle but unexpected connections over a period of three

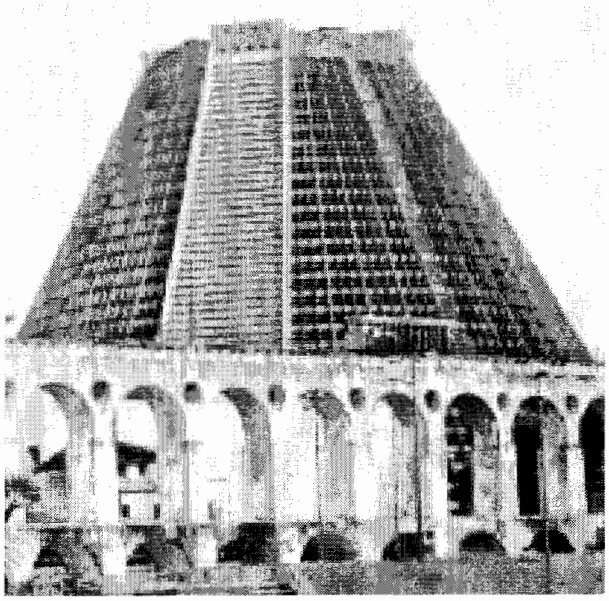


Fig. 10 Edgardo de Oliveira da Fonseca, Cathedral of São Sebastião, Rio de Janeiro. Courtesy of the author

decades reveal that the process of discovery is as complicated as it is stimulating to examine, as unpredictable as the fusion of imagery from disparate sources would suggest, at once multi-directional and deeply creative. Le Corbusier's work had a lasting effect on Brazilian architecture, and South American culture, topography and the landscapes of Rio de Janeiro, including both natural elements and the work of human hands, had a profound influence on the work of Le Corbusier. The sources of these influences long neglected or misunderstood inform a cross-cultural dialogue about form and meaning that continues to this day.

NOTES

(1) Leonardo Benevolo. *History of Modern Architecture*. (London: Routledge and Kegan, 1971) p.748. For new literature on streams of influence between Europe and South America see Kenneth Frampton. "Le Corbusier and Oscar Niemeyer: Influence and Counterinfluence, 1929-1965", in *Latin American Architecture*. (New York: The Monacelli Press, 2004).

(2) See Rachel Sisson. "Rio de Janeiro, 1875-1945: The Shaping of a New Urban Order" in *The Journal of Decorative and Propaganda Arts 21*, (1995): p.144. Good information on the architecture of the Modern Movement in Brazil can also be obtained from Zilah Quezado Decker, *Brazil Built, The Architecture of the Modern Movement in Brazil*. (New York: Spon Press, 2001).

(3) See Lauro Calvacanti. *When Brazil was Modern*. A Guide to Architecture 1928-1960 (New York: Princeton Architectural Press, 2003) p.14.

(4) ibid, and also Fernando Oyarzun's *Le Corbusier Y Sudamerica* (Santiago: Ediciones de la Escuela de Arquitectura, Pontificia Universidad Católica de Chile, 1991) 244.

(5) ibid, and also Fernando Oyarzun's Le Corbusier Y Sudamerica. Santiago: Ediciones de la Escuela de Arquitectura, Pontificia Universidad Católica de Chile, 1991) 244.

(6) See Le Corbusier, 1887-1965, *Precisions on the Present State of Architecture and City Planning: with an American prologue, a Brazilian Corollary* translated by Edith Schreiber Aujame. (Cambridge: MA: MIT Press, 1991) 245. See also Jean Pierre Giordani in *Le Corbusier, Une Encyclopedie*. Edited by Jacques Lucan. (Paris: Centre Georges Pompidou,1987) 402 and William J. R Curtis, Le Corbusier, Ideas and Forms. (Oxford: Phaidon Press, 1986).

(7) See Mary McLeod, "Le Corbusier and Algiers" in *Oppositions* (Cambridge MA: MIT Press.Winter/Spring 1980) p. 55.

(8) See Affonso Reidy, *Brazilian Architects*. (Lisboa: Editorial Blau, 2000).

(9) See Lauro Calvacanti. *When Brazil was Modern. A Guide to Architecture 1928-1960*. (New York: Princeton Architectural Press, 2003) 260.

(10) See Yves Bruand, *Arquitectura Contemporanea no Brasil*. (São Paulo: Editora Perspectiva, 2002) 230.

(11) See Yves Bruand, *Arquitectura Contemporanea no Brasil*. (São Paulo: Editora Perspectiva, 2002) 230.

(12) See Srdjan Jovanovic Weiss and Sabine von Fischer "How to Read Two Monoliths" in *Cabinet*, (Brooklyn, N.Y.: Immaterial Inc. Issue 6, Spring 2003.

(13) ibid.

(14) ibid.

(15) Lauro Calvacanti. *When Brazil was Modern: Guide to Architecture 1928-1960*. (New York: Princeton Architectural Press, 2003) 267

(16) See Le Corbusier Oeuvre Complete volume 5, 1946-52. (Zurich: Les Editions d'Architecture,1953) 55.