

Architecture for children: colonial architects, climate design and enduring nursery buildings (1957-1964)

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Abstract.

The architecture of school buildings in former colonial territories became archetypal in terms of climate response by architects who mastered the language and technological lexicon of the Modern Movement. These architectures have been identified as optimal responses to a discourse close to current theories of mitigating the Anthropocene, insofar as they were focused on sustainable design and reduced the use of climate control technologies. After WWII, pivotal studies on designing with climate, by authors trained in former colonial geographies, such as the British architects Jane Drew and Maxwell Fry, encouraged school buildings to adapt adjusted to the various challenges of modern culture, including the climate and local resources. This position was widely promoted in the early historiography of the Modern Movement, which centred on the Global South, and extended to the study of Portuguese colonialism.

Against this background, this paper examines two nursery schools built in Maputo (Mozambique) and Luanda (Angola) in the early 1960s by the architects Pancho Guedes and Simões de Carvalho. These projects conveyed international debates that were in broader meetings promoting modern culture, such as the UIA (*Union Internationale des Architectes*). In particular, the *Charter for School Buildings*, resulting from the Rabat meeting in 1959, would have a direct impact on the rejection of the monumental scale, the introduction of spatial flexibility, structured circulation, and outdoor spaces on a child's scale. The nursery in the Cazenga neighbourhood (Angola) and the Piramidal kindergarten (Mozambique) are now established as educational institutions adapted to contemporary societies, with little maintenance and occasional adjustments to new programmes, reinforcing a formal and technical performance open to post-colonial societies and challenging the framework of their original conception. As true *Architectures for Children*, these buildings continue to contribute to early environmental education.

KEYWORDS: Portuguese Colonial Architecture; Angola; Mozambique; Kindergarten

1. INTRODUCTION¹

In 1944, the British architects Jane Drew (1911-1996) and Maxwell Fry (1899-1987) wrote a first book about architecture. Topics ranged from shelter as a biological need to systems of construction, design, history. It is not clear why this first edition was titled *Architecture for Children*, but it may have been from a didactic perspective. From the first pages, the school programme appeared as a potential guide to understanding the need for architecture.² According to the young couple, the school added to the problems raised by

the design of the house: “There is the question of how to warm you in winter; how to keep you cool in summer, how to give light when dusk falls (...)”.³ The study was renamed *Architecture and the Environment* in 1976, emphasising that modern forms should follow the sustainable avant-garde design.

Further books published by the duo between 1956 and 1964 would reinforce a “Tropical Modern” design,⁴ in which the “Educational Building” became one of the protagonists in the formation of new African nations. Drew and Fry also became notable for designing schools from the British colonial period to post-independence, “delivering an architecture that was not overtly 'colonial', yet responded to the colonial notion of school”,⁵ as Iain Jackson and Jessica Holland argued. Drew made the first plan of a school for a model village for Kenya (not built, 1938).⁶ However, it was Fry who would add one of the two types of nursery school to the duo’s list of educational buildings (Fig.1). These “small nurseries”, from 1956,⁷ were included in a larger series of schools built in Chandigarh (from 1951 onwards) and had “the front façade designed to be opened, blending the inside with the outside”.⁸ Similarities to this plan can be seen in the proposals by the architect Fernão Lopes Simões de Carvalho (b. 1929, Luanda, Angola) – whose work will be discussed in this paper – as the kindergarten in Novo Redondo, now Sumbe, Angola, from 1961.⁹

Between 1950 and 1966, Drew and Fry designed more than twenty-five school buildings, from the UK to Kenya, Ghana, Togo, Nigeria, and India.¹⁰ These designs were adapted to the tropical climates before any innovative programmatic formulation was even considered. Of “primary schools,” they wrote: “The program is simple – a room or rooms, a store, a latrine.”¹¹ If in Africa the more conventional aspects of education were shaped by the axial organisation of these buildings, in post-colonial Punjab, India, the Model Secondary School in Sector-23 may have represented a step towards the “school under the tree”, confirming the belief attributed to Drew that “education could take place beyond the classroom”.¹²

Figure 1. Maxwell Fry, Nursery School, Sectors-22&23, Chandigarh, Republic of India, 1956. © Credits Kiren, *Documenting...*, 1999; Inês Nunes, 2024.

This language was consistent with later guidelines for school design, which proposed the school both as “a complement to housing”¹³ and as a promoter of “active teaching”.¹⁴ Major professional bodies, such as the International Union of Architects (UIA) began to include teaching in outdoor spaces in their recommendations. Collaboration between pedagogues and architects was advocated with the aim of “establishing standards”¹⁵ that could be extended to functionalities and construction systems.

The school building soon became an architectural reference, placing children as interlocutors of the possibilities of modern design. It should be noted, though, that the interplay between a modern educational system and modernist architecture remained a “paradox” that “imposed a foreign pedagogy and associated cultural ethos, only partially modified to local conditions,” as Liscombe argued about Fry and Drew’s work in Africa.¹⁶ In colonial circles, the formation of a “new” individual had more complex aims than “climate literacy” through architecture. It oscillated between a process of re-education to create (so-called) “civilised” societies, or a pragmatic response to the “developmental” demands of organisations such as the United Nations (UN). Portugal, a full member of the UN since 1956, accelerated the construction of schools in the post-war period in compliance with international agreements.¹⁷

This paper considers the extent to which colonial architects sought to go beyond the abovementioned socio-political goals while incorporating groundbreaking interpretations of the latest pedagogical approaches of the time. Although most architects were part of the group of experts who participated in supporting colonialism – a process with significant physical, social, and identity nuances that architectural history has come to engage with, challenging the positivist, Western-centric, and canonical views that have been earlier ascribed to the Modern Movement¹⁸ –, they introduced key devices into their proposals that transformed schools into places open to local cultures.

2. EARLY CHILDHOOD SCHOOLS IN THE TROPICS

This paper surveys two nurseries designed in Africa in the early 1960s by the architects Pancho Guedes (1925-2015) and Simões de Carvalho: the Piramidal Kindergarten¹⁹ and the nursery and kindergarten at the Cazenga Assistance Centre.²⁰ The first, in Lourenço Marques, now Maputo, the capital of Mozambique, was commissioned by Catholic nuns.²¹ It was built from 1957 onwards in the Summershield neighbourhood, a city's "wealthy suburb",²² and opened in 1961.²³ The latter, in Luanda, the capital of Angola, was part of a community centre, designed in 1963 for the Administrative Commission of the Fund for the Popular Neighbourhoods of Angola (CAFBPA). It was intended for disadvantaged African populations.

While Pancho Guedes' drawing belongs to a new lineage in his creative production – which he would provocatively call the "American-Egyptian style", incorporating the "eighth book" of *Vitruvius Mozambicanus*²⁴ – Simões de Carvalho's nursery was most likely an adaptation of a project developed around 1962 for the Angolan Provincial Settlement Board (JPPA). Both proposals were designed for children between the ages of three and five, as were Fry's schools built in India.

Significantly, they were launched at a singular moment in the debate on educational buildings in Portugal. The third edition of the UIA, held in Lisbon in 1953, had innovatively set up a working group on school buildings. Two main dilemmas guided the debate: on the one hand, the urgency of finding constructive and design solutions to overcome the serious lack of equipment for children and young people after WWII and in the face of increasing literacy programmes; on the other hand, the preference for buildings located in open and green spaces, integrated into "nature".²⁵

Pedagogical and hygienic needs were also discussed. Regional variations within national contexts were encouraged based on differences in climate. There was agreement on the idea of an "open school, because air, light and movement give students greater vitality and interest in their lessons".²⁶

Portugal was represented by the architect Januário Godinho (1910-1990). His account of the Portuguese situation focused on the interplay between a country's economic situation and its constructive performance. He called for traditional systems to be used in the construction of schools, responding to specific regional and socio-economic contexts,²⁷ reacting cautiously to the wave of serialisation and prefabrication of post-war modern culture.²⁸

Although architects in Portuguese colonies in Africa were not engaged in the central debates, they produced architectural works that reflected some aspects of the discourse. Until the late 1950s, the typological options for school construction were largely determined by the Colonial Public Works (CPW)'s models, crossing a range of architectural styles.²⁹ From that point onwards, "the notion that climate was the first constraint to be considered for

building low-cost schools” began to emerge in the minds of architects.³⁰ This rationale could be depicted in the schools designed in Angola, by the female architects Manuela Silva Mota (1936-?) and Antonieta Jacinto (1930-2021), around the early 1960s. These plans used devices to open the classrooms, “completely eliminating any separation between inside and outside”.³¹

Despite the purported scientific and climatic standards, the examination of colonial school programmes must consider the socio-political circumstances in which they were implemented, acutely the enduring colonial networks of expertise and the asymmetric power dynamics of colonialism.³² Moreover, the post-war rise in mass literacy in Africa cannot be understood in isolation from the outbreak of the struggles for liberation in Angola in 1961 and Mozambique in 1964. The warfare would influence the development of new educational models in both rural and urban areas, while driving architects to search for quick solutions with various construction materials.

2.1. The Piramidal kindergarten (Maputo, Mozambique, 1957-1961)

Pancho Guedes has been highlighted as a key figure of architectural production in colonial Africa.³³ Pancho’s career in the design of school buildings is well-documented, gathering aesthetic and constructive diversity. In his words, schools were “learning machines” and he was motivated to design them after discovering a “multiracial school in Swaziland”.³⁴

By 1972, Pancho had designed around nine school buildings. If the Piramidal kindergarten was the starting point of this production, the clandestine school in the “caniço” (slum), also in Maputo, designed eleven years later, was the height of his reflections on this programme, evoking the traditional habitat. This was the building he showed to Alison and Peter Smithson in the late 1960s.³⁵ Both schools use modular squared elements with a pyramidal roof. This latter element had a double meaning: in the Piramidal kindergarten it was a scholarly citation of Louis Kahn (1901-1974); in the clandestine school it mimicked the local self-produced constructions. While the *caniço* school supported the city’s poor community, the Piramidal kindergarten was aimed at settler children.

The Piramidal school, with a capacity for 180 children (which soon rose to 300), had a two-storey body, leading to a chapel (now a gymnasium), and giving rise to a series of external modules (storerooms). The main volume housed the classrooms, separated in pairs by the sanitary facilities.³⁶ The upper floor, originally intended as a dormitory, was quickly converted into more classrooms. In 1964, Pancho described the building as being “white and blue with a little grey”.³⁷ Today it has a much more vibrant colour palette (Fig. 2).

Figure 2. Pancho Guedes, The Piramidal kindergarten and plan diagram, Maputo, Mozambique, 1957-1961 © Credits Ana Vaz Milheiro, 2016; redrawing Filipa Fiúza.

Pancho wanted the school to be transformed into “many rooms of joy... and that every day [would] be one of celebration”.³⁸ The outside had plenty of trees, making the “courtyard surrounded by a large and pleasant wall of green shade”.³⁹ Given Pancho’s strong awareness of the artistic impact of architecture, it was not the technical means of adapting to the climate that stood out in his speech – despite their power in defining design – but rather the sculptural elements evoked archaic architectural presences, the most obvious being ancient Egypt. The playgrounds of Dutch architect Aldo Van

Eyck (1918-1999) also echoed.

2.2. Nursery and kindergarten at the Cazenga Assistance Centre (Luanda, Angola, 1963-1965)

In Angola, Simões de Carvalho represented a different type of architect to Pancho. Despite his close association with Le Corbusier (1887-1965),⁴⁰ Simões saw himself as a technician and avoided the more artistic aspects of the architectural discipline.

The architect – who grew up in Luanda – promoted an architectural design anchored in climate control. While designing the nursery and kindergarten at the Centro Assistencial da Cazenga, in the early 1960s, he also worked on other projects for early childhood.

In 1963, after completing the mentioned two-rooms nursery for Sumbe, Simões proposed, with the architect Pinto da Cunha (1921-1985), a primary school and a kindergarten for the Fishermen's neighbourhood in the Island of Luanda (1963). The classroom was seen as a cell, creating relationships between the other programmatic elements. The simple plan was made complex by the elevation of the volumes. The walled elements were a key response for cross-ventilation and visually filtered the relationships between public and private outdoor spaces⁴¹.

The kindergartens for the JPPA presented architectural elements inspired by other functional programmes – such as housing – by having vaulted roofs and an L-shape, with outdoor areas.⁴² They were located in neighbourhoods mainly inhabited by the local African population as Simões trusted the school as the anti-segregation programme par excellence. These earlier plans were decisive in the design process of the Cazenga educational nucleus (Fig. 3).

Figure 3. Simões de Carvalho, Nursery and Kindergarten of the Cazenga Assistance Centre and plan diagram, Luanda, Angola, 1963-1965 © Credits Ana Vaz Milheiro, 2023; redrawing Beatriz Serrazina.

Neither the drawings nor the working process of the Cazenga buildings have yet been located. Recent visits to the site revealed that the educational area was accessed via a passageway. The nursery was organised around a courtyard with a large tree and shaped by a portico of columns with a circular section. This central courtyard gave access to the rooms. The interiors were equipped with toilets and furniture adjusted for children up to five years of age. A mural of children's drawings closed faced the entrance hall, marked by a low bench with an organic shape. Plastic details can still be seen in small squared and rectangular openings in the façade of the staff office, giving the interior a sculptural luminosity.

It is worth noting that Simões de Carvalho used the Modulor's dimensions to increase the sense of comfort, contributing to the almost domestic scale of the building. Ventilation ran freely along the ceilings.

3. CONCLUSIONS

The kindergartens by Pancho and Simões de Carvalho in Mozambique and Angola proposed different typologies and unique ways of learning. While the former maintained a linear logic and was innovative in its approach to outdoor spaces and circulation between functions, the latter stood out for taking advantage of a central courtyard to extend teaching activities and circulation outdoors, while also transferring the playground to open space.

Both went beyond the *form-follows-climate* formulation to propose spaces

that were a real alternative to colonial education from the richness of their functions. This process resulted from previous experiences, including those of other architects, who began to open buildings' plans to the playground. These were broad interpretations of the theses promoting education beyond the classroom – such as those of Jane Drew.

In the case of Pancho's school, differentiated education was offered in the context of private structures, aimed at upper-class settler families. Simões de Carvalho's proposal, on the other hand, directly affected the education of low-income African populations, following his beliefs in a multiracial public school, strongly rooted in the so-called *popular* neighbourhoods.

The two schools ended up replacing the “civilizing” purposes foreseen in the educational dynamics of the colonial war,⁴³ by adopting a more universal and humanist approach. Architecture was thus supposed to be an active part of a “mental” construction by rejecting the monumental and aesthetic languages of the colonial state. Architects believed they were contributing to a future society with higher demands concerning function, technology, comfort and environmental behaviour. The permanent use of the two nurseries over the last 60 years, with minimal maintenance work and minor adaptations, mostly to increase their capacity, reveals the resilience of their modern design. They are considered here as true “Architecture(s) for Children” which shaped and continue to shape societies that are more rigorous about the value of their collective spaces.

4. BIOGRAPHY

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¹ This research was funded by the European Union (ERC, ArchLabour, 1101096606), chaired by Milheiro; by the FCT through the "ArchWar" project (<https://doi.org/10.54499/PTDC/ART-DAQ/0592/2020>), chaired by Milheiro&Fiúza; and by IL Rodrigues' grant, FCT "Beyond Modern Housing..." (<https://doi.org/10.54499/2022.00268.CEECIND/CP1750/CT0007>).

² Jane Drew and Maxwell Fry. *Architecture for Children* (London: George Allen and Unwin, 1944) 43–44.

³ Idem: 44.

⁴ E.g. "Tropical Modernism: Architecture and Independence," V&A Museum, London (2024). Visited as part of the preparation of this article (04/05/2024).

⁵ Iain Jackson and Jessica Holland, *The Architecture of Edwin Maxwell Fry and Jane Drew* (London: Routledge, 2016), 165.

⁶ Idem: 337.

⁷ See Kiran Joshi, *Documenting Chandigarh* (Mapin Publications, 1999), 195.

⁸ Idem: 243.

⁹ "A kindergarten preliminary project," 1961 (José Pinto), FLSC Archives.

¹⁰ Idem: 337ff.

¹¹ Maxwell Fry and Jane Drew, *Tropical Architecture in the Dry and Humid Zones* (Florida: Krieger Pub. Co., 1964 [1982]), 141.

¹² Jackson and Holland, *The Architecture* (2016): 245.

¹³ [UIA, International Union of Architects], "School Construction Charter," *Binário* 77 (1965): 506.

¹⁴ Idem, 508.

¹⁵ Idem, 509.

¹⁶ Rhodri Liscombe, "Modernism in Late Imperial British West Africa: The Work of Maxwell Fry and Jane Drew, 1946-56," *JSAH*, 65 (2016): 194.

¹⁷ See Ana Vaz Milheiro, "Escolas em Angola durante o Estado Novo: arquitectura e arte," *Revista de História das Ideias*, 32 (2011): 601–630; Margarida Quintã, "Modern Schools in Angola, 1961-1975: Design with Climate and Heritage," PhD Thesis, IST, 2019.

¹⁸ See, among others, Ikem Stanley Okoye, "Architecture, History, and the Debate on Identity in Ethiopia, Ghana, Nigeria, and South Africa," *JSAH*, 61 (2002): 381–396.

¹⁹ Ana Tostões and Zara Ferreira, "Jardim Infantil Piramidal. The birthplace of "Américo-Egípcio," in Tostões (ed.), *Modern Architecture in Africa: Angola and Mozambique* (Casal de Cambra: Caleidoscópio, 2014), 328.

²⁰ Ana Vaz Milheiro, "Fernão Lopes Simões de Carvalho, o arquitecto do Béton Brut," *JA – Jornal Arquitectos*, 236 (2009): 23. In his CV, Simões named this project the Cazenga Children's Centre, but this toponym refers to a different neighbourhood today.

²¹ Pancho Guedes. *Manifestos Essays Speeches Publications* (Lisbon: OA, 2007), 36.

²² Pancho Guedes. *Pancho Guedes Vitruvius Mozambicanus* (Lisbon: Colecção Berardo, 2009), 142.

²³ Tostões and Ferreira, "Jardim Infantil" (2014): 328.

²⁴ Pancho Guedes, "Vitruvius Mozambicanus," *Arquitectura Portuguesa* (1985): 36.

²⁵ UIA, *Troisième Congrès de l'Union Internationale des Architectes: Rapport Final* (Lisbon: BNP, 1953), 339–409.

²⁶ UIA, *Troisième Congrès* (1953): 350.

²⁷ Idem: 356.

²⁸ Idem, 357.

²⁹ For Angola, see Maria Manuela da Fonte, *Urbanismo e Arquitectura em Angola* (Casal de Cambra: Caleidoscópio: 2013), 329–357. For Mozambique, see André Ferreira, “Obras Públicas em Moçambique,” Master thesis, FCTUC, 2006: 137–140.

³⁰ Quintã, “Modern Schools” (2019): 35–37. Silva Mota designed primary schools for four types of climate.

³¹ Fonte, *Urbanismo e Arquitectura* (2013), 344.

³² Jiat-Hwee Chang, *A Genealogy of Tropical Architecture* (New York: Routledge, 2016).

³³ Miguel Santiago, *Pancho Guedes, spatial metamorfoses* (Casal da Cambra: Caleidoscópio, 2007), 27–49.

³⁴ Guedes, *Pancho Guedes* (2009), 183.

³⁵ For Pancho and Team 10 see Jorge Figueira, “The hand that rocks the cradle,” in Taborda, *Lisboscópio: Official Portuguese Representation at the 10th International Architecture Exhibition – Venice Biennale* (Lisbon: Instituto das Artes, 2006), 99–109.

³⁶ Tostões and Ferreira, “Jardim Infantil” (2014): 330.

³⁷ Guedes, *Manifestos Essays* (2007): 36.

³⁸ Idem.

³⁹ Idem.

⁴⁰ Through contact with André Wogenscky (1916-2004), cf. Milheiro, “Fernão Lopes” (2009): 22.

⁴¹ Fonte, *Urbanismo e Arquitectura* (2013): 345–346.

⁴² “JPP-EJ”, C001-C010, 07/31/1962, FLSC Archives.

⁴³ Fonte, *Urbanismo e Arquitectura* (2013): 345–346.

Figure 1

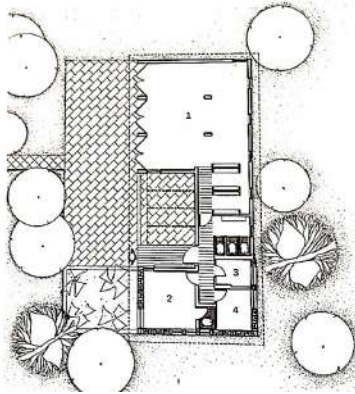


Figure 2

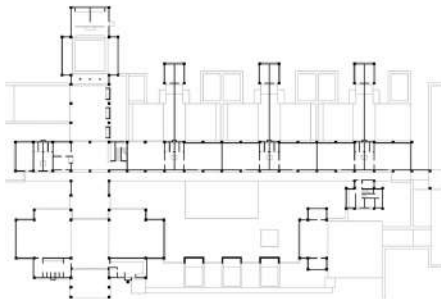


Figure 3

