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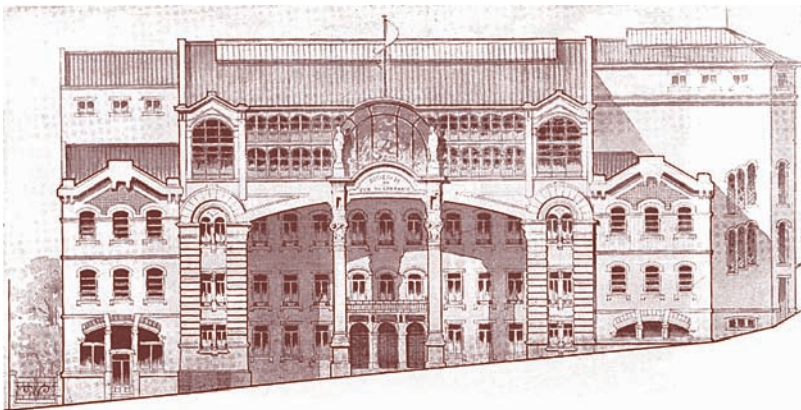
Describing primary schools in a small city in Portugal is an opportunity for an overall look at the evolution of schools in general as special public buildings. A look at four of the six primary schools in the city of Caldas da Rainha shows how these public buildings have evolved, what they represent to the community, and how their architecture has corresponded to changing concepts in education and demands for flexibility over the years.

EVOLUTION OF EDUCATIONAL BUILDINGS, A QUICK VIEW

Educational facilities became important public and specialised buildings since governments began to face the right of populations to education (Burgos, 2001). Policies to provide educational buildings that respect modern notions of comfort and hygiene led architects to develop architectural concepts that corresponded to new demands on education.¹



Façade of schools built before the establishment of the Republic (1911), designed by Francisco de Almeida Grandella for his “working men’s towns” or settlements linked to his business interests. They were places for education but were also civic centres. Note the classicism reflecting growing republican ideas and the star in the front reflecting Masonic ideals.



Headquarters of “Voz do Operário” in S. Vicente, Lisbon, designed by Norte Junior in the early 20th century with pre-primary and primary schools but also with public baths, a doctor’s surgery, a library and a support centre for the elderly. These public buildings were specially designed to provide education and social services.

1. For example, Ernst May and Martin Elsaesser’s experimental schools from 1927 in Frankfurt, Richard Neutra’s Lovell House and Earnest Kump’s work in California, and designs by Bruno and Max Taut in Neukölln, Lichtenberg, Berlin.

The need to educate large groups of students of different ages and the post-World War II massive construction of schools in Europe resulted in the creation of different building models that were repeated across the continent and beyond. Throughout the 20th century, these models were developed following concepts of Modern Architecture and pedagogical advances in education, with countries adapting them to their specific environments.

SCHOOLS IN PORTUGAL

In Portugal the concept of flexibility has generally been adopted in the design of schools, which used to be built to last 50 to 100 years. Throughout the country there are schools that have been in use for over 100 years, seeming to adapt to new educational demands with their spaces proving to be flexible. These are schools whose image and name are associated with tradition, and which retain the culture of their past in their very existence and image today.

The majority of educational facilities in Portugal have always been built according to standard designs used by school authorities. Subsequent changes including extensions to many of them show how flexible these buildings are, having adapted their spaces more or less successfully to meet new educational demands, the changing needs of educational communities and even to serve new functions not related to education. This kind of flexibility is also a result of the modular concept used in standard designs.

2 CALDAS DA RAINHA'S PRIMARY SCHOOLS

The city of Caldas da Rainha, located 80 kilometres north of Lisbon on Portugal's west coast, has a population of 25 000. By Portugal's standards, Caldas da Rainha may be considered a medium-size city. It has become one of the economic centres of the Western Region and, while other Portuguese cities are suffering a decrease in population, has been successful in retaining its residents.

Six public schools meet the city's need for the first cycle of mandatory primary education (the first four years). They serve a total of 1 500 children, including 170 children at pre-primary level in two of the schools.

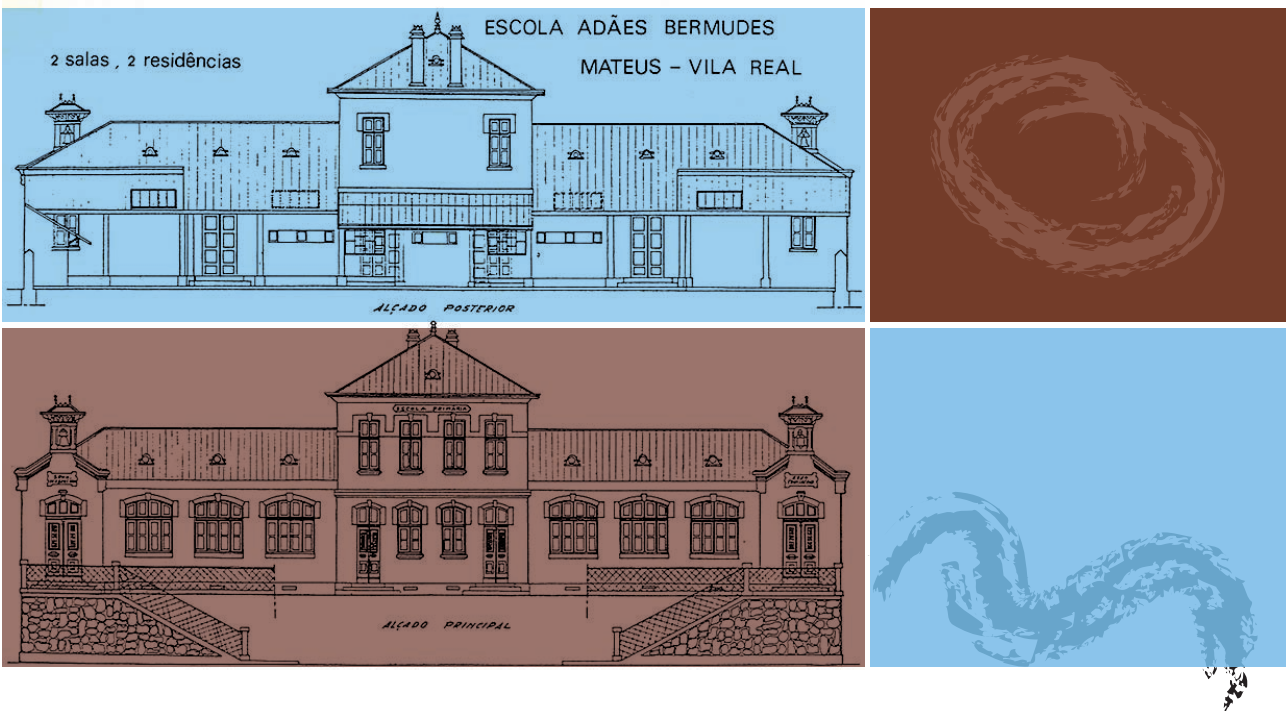
The four primary schools from Caldas da Rainha described below reflect the history of educational buildings in Portugal. The country's earliest guidelines for school buildings date from 1917 and provided "technical, hygienic and pedagogical norms" (Beja *et al.*, 1966). The government imposed strict rules and financial constraints regarding classroom size, area per student, building materials and finishings, according to regional construction techniques, health requirements and educational needs.

1898 – Parque School



The *Parque* School design dates from 1898 and won the Golden Medal for Architecture of Schools at the Paris Universal Exhibition in 1900. Its architect, Adães Bermudes, "planned simple schools, which reflected not only the needs of the time in terms of teaching science and hygiene but also certain republican ideals" (Beja *et al.*, 1966).

The design was submitted for a competition organised by the Minister of Public Works calling for either a single-sex school with one or two classrooms or a mixed, two-classroom school.



The classrooms were intended for 50 or 100 students with 1.25 square metres per student and a ceiling height of 4 to 4.5 m. The classrooms were located on the ground floor and each had three large windows on the front of the building to provide plenty of natural lighting and ventilation.

The building included a two-storey house for the teacher and a room for his assistant. The teacher's house was placed at the front of the school instead of the back as in previous models. This more prominent position reflected the new social status given to teachers recognising the importance of their mission.

Approximately 180 of these one- and two-classroom schools were built in Portugal with small variations on Adães Bermudes' standard design. Records from 1961 show an additional 120 similar buildings built under Adães Bermudes' responsibility or designed by other architects.

Today, the *Parque* School serves 64 students and is responsible for various educational activities such as vocational training and an accreditation programme.

The 1944 model – Bairro da Ponte School

Bairro da Ponte School was built in 1969 according to the State Centennial Plan for school buildings established in 1944; the design evolved during the 1950s. The model called for two, four, six or eight classrooms in separate boys and girls schools.

The classrooms were designed for up to 50 students and measured 62 m², with a 4- to 4.5-metre-high ceiling. Minimum window to floor area ratios were specified to guarantee natural lighting, along with numerous other dimensional, programmatic and construction norms. The schools respected health recommendations and additional conditions for the well-being of students and teachers.



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Schools built according to the 1944 model proved fit for educational purposes until the 1980s, when major changes took place in education. They have since had to undergo improvements like adding canteens and libraries, but otherwise the school continues to be based on the 1944-classroom concept.

Bairro da Ponte School has 379 students. A library, a multipurpose hall, a principal's office and an administrative office have been added.

Since the 1960s – Encosta do Sol School and Bairro dos Arneiros School

Schools such as *Encosta do Sol* resulted from the New Buildings for Primary Schools Plan implemented since the 1960s. The classroom dimensions were set at 6 by 8 m² (48 m² for 42 students seated in 3 rows of 7 double desks), and all construction elements were standardised and simplified. Façades, windows and doors were stripped of all decorative elements and roofs were simplified to reduce costs.

Encosta do Sol School was constructed during the 1970s according to an "urban type" project with four classrooms. More classrooms were added later, along with a principal's office, an administrative office and a library. The school now has 365 students and continues to use the original classroom concept.



Bairro dos Arneiros School was built in 1973 as an "urban type" project similar to the *Encosta do Sol* School, with eight classrooms. It currently has 439 students, 83 at the pre-primary level. While no classrooms have been added, extensions were made to house a library, a principal's office, administrative offices and a canteen. *Bairro dos Arneiros* School includes special facilities for people with disabilities, being the best-prepared school for this purpose in the city. It also boasts particularly large playgrounds.

CONCLUSION

These four schools provide for the majority of Caldas da Rainha's primary school population. The buildings were constructed according to 30-, 60- and 100-year-old designs and, while having undergone additions due to parental demands (canteens), management demands (administration rooms), and pedagogical and social demands (libraries and multipurpose halls), are able to serve 1 370 of the city's 1 500 primary students.

A more detailed study of how these schools, with classrooms designed for 50 and 100 students, are being used in the 21st century would shed light on the relationship between new educational practices and schools such as these which are typical of many.

Good architecture is important for schools. Are these long-lasting buildings good examples of how the architectural concept of flexible educational spaces can support pedagogical and functional changes? How does the educational built environment contribute to the stability and preservation of community institutions?

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