

Research for Development

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Buildings for Education

A Multidisciplinary Overview
of The Design of School Buildings

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Research for Development

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Preface

This book belongs to a series, which aims at emphasizing the impact of the multidisciplinary approach practiced by ABC Department scientists to face timely challenges in the industry of the built environment. Following the concept that innovation happens as different researches stimulate each other, skills and integrated disciplines are brought together within the department, generating a diversity of theoretical and applied studies.

Therefore, the books present a structured vision of the many possible approaches—within the field of architecture and civil engineering—to the development of researches dealing with the processes of planning, design, construction, management, and transformation of the built environment. Each book contains a selection of essays reporting researches and projects, developed during the last six years within the ABC Department (Architecture, Built Environment, and Construction Engineering) of Politecnico di Milano, concerning a cutting-edge field in the international scenario of the construction sector. The design of schools has been recognized as one of the hottest topics in architectural research, also for the criticalities detected in the current conditions of Italian school buildings.

The papers have been chosen on the basis of their capability to describe the outputs and the potentialities of researches and projects, giving a report on experiences well rooted in the reality and at the same time introducing innovative perspectives for the future.

With the aim of exploring the evolutionary scenario of school design as an architectural topic, the collected papers were selected according to a comprehensive and multidisciplinary overview. Researches on typology and spatial organization are enriched through the contribution of a historical and social perspective to enlarge the focus on the urban role of the school buildings. Moreover, innovative approaches and tools have been highlighted both in the design process and in the education techniques. The presented experiences include best practices of

consistent and coordinated contributions of the several disciplines involved in the design of school buildings, also implementing digital tools. Finally, the issues related to the challenges of the existing built stock triggered the development of more technical and specialized, albeit multidisciplinary, investigations and case studies' reports.

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Introduction

Background

The design of educational spaces dedicated to school is a rather recent topic in Italy, since until the end of the nineteenth century and the unification of the country,¹ children were educated exclusively in private or ecclesiastical environments; and only later, the school education was recognized for its significant role in the teaching and learning processes (Pennisi 2012). The evolution of the architectural school typology and of the primary school in particular, can be analyzed as a complex combination of political, cultural, social and urban planning issues and as a reflection of the historical situation. Through the analysis of the educational buildings erected in the different periods, it is possible in fact to detect the evolution of the legislative framework, aimed at defining hygienic and comfort requirements, and of the organization of spaces required by the different pedagogical approaches. The study of the architecture of existing schools reveals a sequence of construction systems, both traditional and innovative, from masonry walls to reinforced concrete frames and to prefabricated solutions, which were employed to better respond to changing needs (in particular, low construction and maintenance cost and construction time reduction). Finally, and with a strict connection with the above considerations, the role of the school building in the city is remarkable at the urban level also, for its ability to promote the development of entire neighborhoods of a city or for the ability to revitalize an existing portion of a city in relation to other public services and open spaces.

¹The compulsory education was introduced in Italy with the Casati Law, issued by the Minister of Public Education Gabrio Casati in 1860. This law entrusted the central government the obligation to enact laws in relation to school education and the management of public schools and gave private individuals the possibility of founding and managing institutions, but without the right to confer educational qualifications. In this period, elementary education became free, compulsory only for the first two out of four years (i.e., for pupils aged 6–7 years) but only present in cities with over 4000 inhabitants or in secondary education institutions (Laurenti and Dal Passo 2018).

The Current Situation

The results of a more than a centenary process of school buildings' construction are significant from a quantitative point of view. The whole stock of educational buildings of all levels and dimensions amounts to 42,408 units, hosting 7,816,408 students in 370,597 classes (Miur 2017), distributed all over the national territory (see Fig. 1). However, this is an extremely heterogeneous heritage,² because of the aging, the functional and often physical obsolescence, which ultimately does not respond to the current demands in terms of teaching and learning methodologies, but also because of the low comfort and safety performances and of fruition and accessibility problems (lack of compliance with “Universal Design” goals).

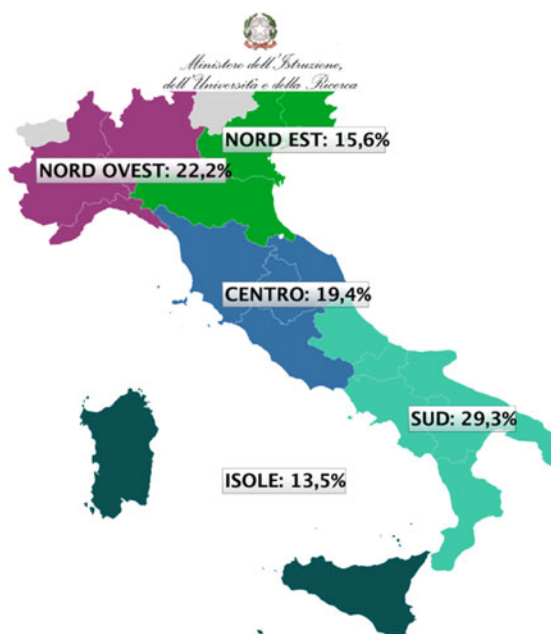


Fig. 1 Distribution of the educational buildings on the Italian territory (Source: MIUR—*Portale unico dei dati della scuola, Anagrafe scuola*)

² Thirty-two percent of the schools was built after 1976, 27% between 1961 and 1975, 12% between 1946 and 1960, 8% between 1921 and 1945, 4% between 1900 and 1920, 3% in the nineteenth century, and 1% before 1800. There is no information for the remaining 13% (Miur 2017).

In addition to the hydrogeological hazard that can affect some schools positioned in risk areas, one of the most urgent issues is related to the high seismic vulnerability characterizing most of the existing schools, which indeed were designed with respect to gravity loading only.

The identification of the seismic areas in Italy started at the beginning of the twentieth century, through the instrument of the royal decree, issued after the destructive earthquakes of Reggio Calabria and Messina on December 28, 1908. Since 1927, the areas hit by earthquakes have been divided into two categories, in relation to their degree of seismicity and their geological constitution. Therefore, the seismic map in Italy was nothing but the map of the territories affected by the strong earthquakes after 1908, while all the territories struck before that date (most of the seismic areas of Italy) were not classified as seismic and, consequently, there was no obligation to build in compliance with anti-seismic regulations. Only in 1974, through the law of February 2, 1974, n. 64, a new national seismic regulation was established which defined the reference framework for the seismic classification methods of the entire national territory, as well as for the drafting of technical standards. Immediately after the earthquake of October 31, 2002, that hit the territories on the border between Molise and Puglia, the Civil Protection adopted the ordinance of March 20, 2003, n. 3274, in order to provide an immediate response to the need to update the seismic classification and seismic regulations. According to the ordinance n. 3274, and unlike the provisions of the previous regulations, the entire national territory was classified as seismic and divided into four zones, characterized by different seismic hazard.

This brief history demonstrates that seismic regulations in Italy are quite recent. Indeed, according to the new registry launched by the Ministry of Education University and Research (Miur 2017), only 8% of the schools was designed in compliance with seismic regulations, 54% is in a vulnerable zone, and around 19,000 buildings are situated in high-risk seismic areas. The collapse of educational buildings in the 2009 and 2016 earthquakes in central Italy and the tragedy of San Giuliano di Puglia (2002), where 27 children died in the primary school building collapse, represent a clear symbol of the gravity of this problem.

A second major issue is related to the inadequate energy performance of the educational buildings, again due to the old construction date and to the evolution of the regulations on the energy performance of the buildings, the first being enacted only in 1976, but with very low requirements in comparison with the current situation. Although the European Energy Performance of Buildings Directive (EPBD) requires that *“the public sector in each Member State should lead the way in the field of energy performance of buildings”* and *“buildings occupied by public authorities and buildings frequently visited by the public should set an example,”* almost 85% of the school buildings in Italy belongs to the bottom classes of the energy performance ranking. Only 5% (Legambiente 2018) of the stock can be classified among the first three classes, a percentage corresponding to the constructions completed after the 2001, when the first regulations requiring a high standard of energy efficiency were enacted. Hence, if the lack of sufficient structural safety can appear as a real threat, the inadequate energy performance is certainly a

waste of resources and a lost chance as well. Energy retrofit programs in fact can become lighthouse projects not only because schools are public buildings visited by pupils, their parents, and the staff, but also because the direct understanding of the behavior of the building envelope and technical systems can help children learn how to support energy savings as responsible users and transfer the knowledge to their families. A further issue to add to the serious situation of the national heritage, related to both structural safety and energy poor performance, is the significant gap between northern and southern regions; an imbalance which characterizes also the funding for ordinary repairs, let aside renovation interventions.

Furthermore, health and indoor comfort requirements should be addressed, especially when considering that almost 10% (Legambiente 2018) of the existing complexes should be cleaned from asbestos.

Finally, the shift toward a knowledge society where information and knowledge are expanding in quantity and accessibility is introducing major changes in teaching and learning models. The information revolution has changed the way we interact with people and things. We live in a society where information is spread out in a large-scale dimension, and new technologies become new tools to change the relationship between time and space. Learning happens everywhere. The new generation of net-native pupils, with an increasingly different set of expectations about space and time, will require constant access to learning materials and resources to share within and beyond the school. Inter-disciplinary learning and collaborative peer-to-peer learning will become increasingly common. New educational models and approaches will be required to help multiple generations, belonging to diversified cultures and in different fields. This will require a general rethinking of the school layouts to overcome the actual strict zoning of the functions and to respond with a higher flexibility to the rapidly changing demand.

The barriers toward the starting of a concrete policy for the renovation or the replacement of the existing stock are varied. It is not just a problem of economic resources but also of a complex set of different issues related to both the diversity of the heritage and the heterogeneous set of institutions responsible for the construction/renovation process. The schools in fact are managed by municipalities as well as by provinces and also directly by the central state. The interventions, considering the major presence of public buildings, are very often subjected to the national public works legislation, requiring a significant effort in planning and organization. One of the challenges is thus how to support municipalities or institutions, especially the smallest ones, in the process from the design activity, to the tendering, to the site inspections and co-ordination during execution, until the final acceptance testing.

The decision for the construction or the retrofit of the school building should consider the relationship with the urban context and the possible potentials that the public building and its annexes can add to the community, for example, in terms of quality of the public spaces, additional resilience in case of emergency³ and of lifelong learning⁴ or integration with other public facilities. A new construction or a requalification can also trigger the regeneration of the surrounding neighborhoods.

The Challenge of Renovation and New Buildings Design

From 2014, in Italy a vast program⁵ of construction of new schools and requalification of existing educational buildings that affect, in different ways, every level of education, from primary schools to universities, have been public financed. Different architectural design competitions were also proposed, beyond the attribution of the design task, to collect innovative proposals able to explore new solutions and approaches for the renovation of the educational facilities. Many examples and competition applications are collected in this book.

This program concerned the transformation of educational and pedagogical approaches, aimed at improving the effectiveness of learning models, as well as the requalification of the existing buildings from an energy-saving and structural safety point of view, the latter with particular regard to seismic vulnerability of the existing buildings.

These themes have long been a field of great interest, experimentation, and research, aimed at developing projects, models, and intervention strategies where different disciplines and skills are involved. The possibility of giving old places a new identity, to update buildings according to the new educational and teaching models, to develop projects that take into account the actual needs of energy savings and structural safety is deeply investigated in the following chapters.

On a broader scale, all these needs offer the possibility of redesigning complex existing buildings and developing projects that play an important role also at the urban level, by becoming reference places, opportunities for redevelopment of degraded parts of a city, new cultural, and civic centers.

This book describes the results of some of the research and consulting works, carried out at the Department of Architecture, Built Environment and Construction engineering (Politecnico di Milano), related to the design of new schools and to the

³ A structural safe school building in seismic areas can be used, for example, as a possible emergency center or temporary accommodation in case of necessity.

⁴ The often-unused spaces of a school building during the evening or weekends can host courses for adults or other continuous learning programs or different activities for the whole community.

⁵Of the ten billion euros invested, five have been spent by municipalities, provinces, and metropolitan cities to construct 300 new buildings and start 12,000 renovation projects. ItaliaSicura, the Council of Ministers authority created to lead and manage the renovation programme, was closed in July 2018 (https://www.corriere.it/scuola/primaria/18_luglio_05/edilizia-scolastica-ambiente-governo-chiude-italiasicura-edef7264-8017-11e8-841c-47290107a48c.shtml).

requalification of existing ones. The description of these activities has been organized into three sections, where particular emphasis is given to the effective collaboration with institutions at various levels and the synergetic combination of the different disciplines involved, needed to respond to their requests through applied and basic theoretical research works.

The chapters, organized into the three different sections, investigate central themes about the buildings for education, focusing, in particular, on the definition of multi-disciplinary approaches for the design of new schools and for the upgrading of existing ones. Among the main topics highlighted, the first section focuses on the relationship between the city and the school as a civic building with a public role for the community also to possibly host different functions. Accordingly, some recent concept designs are featured, carried out within national and international competitions, and analytical and historical studies on the theme of schools and on their typology, as well as on the role of these buildings at the urban level, are reported. In the second section, innovative solutions for both the design and the construction process are analyzed, and in some applications, particular relevance is given to the building information modeling (BIM) strategy as an optimal tool to achieve a synergetic combination of the different disciplines involved. Finally, the third section focuses on the built heritage, particularly: (i) on the tools, technologies, and approaches required to upgrade the existing buildings, in order to comply with the new regulations (in terms of seismic resistance and energy performance); (ii) on the possible transformation of unused constructions into buildings for education, and (iii) on the management of the existing stock. Theoretical as well as applied research paths are reported to illustrate the topic both from the methodological point of view and through real case studies.

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Rural and Urban Schools: Northern Greece in the Interwar Period



Cristina Pallini, Aleksa Korolija and Silvia Boca

Abstract Modernism—as cultural and artistic expression of modern core values—is often associated with urban and industrial contexts, in stark contrast to a “backward countryside”. Focusing on modernist reinventions of the rural landscape, MOD-SCAPES (funded under HERA JRP III call “Uses of the Past”, Oct. 2016–2019) specifically questions these preconceived ideas. In different political and ideological contexts agricultural development schemes carried out in Europe during the twentieth century were pivotal experiments in nation-building policies. In addition, they provided a common testing ground for the ideas, and tools, of environmental and social scientists, architects and engineers, planners and landscape architects, as well as artists. This contribution presents the case study of Northern Greece, focusing on rural and urban schools as a key architectural theme, called upon to express the founding values of a collective identity. The dialectic between tradition and innovation, eclecticism and modernism, uncovers its meaning case by case.

Keywords School architecture · Modernism · Northern Greece · Refugee settlement · CIAM IV

1 Nation-Building and School Architecture

The Kingdom of Greece established in 1829 consisted of Peloponnesus, Mainland Greece, Euboea, the Cyclades and the Sporades, eventually including the Ionian Islands (1863) and Thessaly (1880). After the Balkan Wars (1912–1913), the country almost doubled in size, annexing Epirus, Macedonia, Crete and the Aegean islands. The ambition of a Greater Greece encompassing the coastal regions of Asia Minor collapsed with the Greco-Turkish War (1919–1922), in the aftermath of which 1.3 million Ottoman Christians were forced to cross the Aegean in exchange for half a million Muslims. Asia Minor refugees amounted to almost one-fourth of the population of Greece at the time, a figure favouring cultural homogenization within

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the national territory. The role of schools has been crucial in the process, endorsing Anderson's (1983) idea of the modern school system as a fundamental component for the rising nation states.¹ The impact of a centralised and standardised school system was crucial in Northern Greece, where foreign and minority schools had long backed cultural propaganda and territorial claims. Here, in the 1920s, Asia Minor refugees replaced earlier Turkish, Bulgarian, Serbian or Jewish settlements. In 1930, when the Refugee Settlement Commission handed over the work to the Ministry of Agriculture, Prime Minister Eleftherios Venizelos launched an ambitious programme for upgrading Greece educational asset. The school programme, so crucial to cope with the country's high rate of illiteracy and lack of school buildings, served as a catalyst for a generation of Greek architects, who embraced the revolution of modernism.

2 Branding Hellenism: Late-Neoclassical Proto-Rationalism

In Greece, the first proper schools appeared as late as 1895, following a Royal Decree of 1894, which established their locations and characteristics. These inflected in four standard layouts differing in the number of classes (Fig. 1), defined by Engineer Kallias on the base of French precedents.² The classroom constituted a basic spatial unit, aggregated following the principles of symmetry, regularity and hygiene. Depending on location, the school size ranged from one, two, four to six classrooms. Kallias suggested an elevation for each prototype, laying emphasis on the main

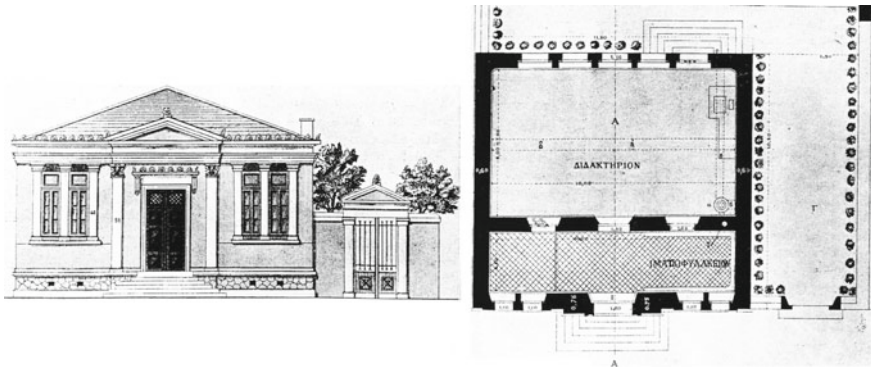


Fig. 1 Single-classroom school by D. Kallias. *Source* Kallias (1906)

¹Cf. Anderson (1983).

²Dimitris Kallias (1858–1939) refers to the French regulation about measurements of classrooms, *Locaux scolaires V* and how during the International Conference on Hygiene and Economicity of School Buildings held in December 1905 in Paris, Greek Schools were highly praised for their features. Cf. Kallias (1906) and Tzonis et al. (2013).

entrance and adopting elements of the neo-classical style introduced in Athens by Bavarian architects. According to the Munich-trained architect Emannouil Kriezis, these schools prioritised discipline over pedagogical criteria, mocking monumentality into urban and rural areas alike, rather than enhancing a sense of place: “pupils should bring back home—into their daily life—something from their school: an idea of beauty rather than mere discipline” (Giacumacatos and Godoli 1985, p. 5).

Combining a functional layout with the idea of Greekness conveyed by neo-classical stylistic elements, Kallias’ prototypes acquired a strategic significance for the Greek communities outside Greece, in Alexandria, Smyrna, Istanbul or Thessaloniki. In Macedonia, the epicentre of a conflict between territorial ambitions and inextricable ethnic and linguistic identities, the impact of the standardised Greek school system was particularly effective. The role of Macedonia as a frontier of Hellenization becomes self-evident when considering the proliferation of maps showing the distribution of Greek, Bulgarian, Romanian and Serbian schools in the *vilayet* (province) of Thessaloniki.³ In this respect, the work of Xenophon Païonidis (1863–1933) for the unredeemed Greeks of the North shows the strategic importance of school buildings. After obtaining a degree in architecture from Munich University (1892), Païonidis moved back to Thessaloniki and succeeded in expressing the architectural ideology of the Greek community, conveying its power, prestige and yearning for independence.⁴ A special chapter of Païonidis’ career concerns his activity for the progressive metropolitan of Kassandra who promoted works of public utility in the small villages of Chalkidiki damaged by the Turks after the Greek insurrection of 1821. Most of his works were actually schools, where younger generations were to learn Greek and nurture attachment to their distant mother country. Somehow juxtaposed to the church, the school was a symbolic presence of new kind. While church architecture drew inspiration from Byzantine precedents, the school was both a functional and evocative presence marking the village core, often harmonising the neo-classical canon with local building traditions. Following Kallias’ prototypes, Païonidis often integrated local building techniques, experimenting with the expressive and values of various materials: different types of stone, exposed brick or marble (Fig. 2).

3 CIAM IV, the Modern School as a Master Problem

In the summer of 1933, CIAM members started their sea voyage from Marseille to Athens on the *Patris II*, where Le Corbusier enthusiastically declared that the Acropolis had turned him into a rebel (Le Corbusier 1933). Later on, they sailed to the Cyclades where, almost unexpectedly, they found traditional villages made up

³ According to the “Map of the Christian Schools of Macedonia” (*Carte des Écoles Chrétiennes de la Macédoine*) published in the volume *La Macédoine, son passé et son présent* by Phocas-Cosmetatos (1919).

⁴ Cfr. Mandopoulou-Panayotopoulou (1997).

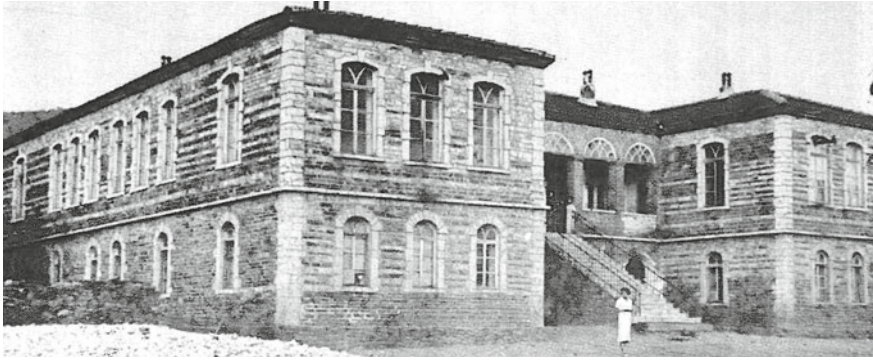


Fig. 2 Greek Primary School at Ormilía (Chalkidiki) by Xenophon Paionidis, 1907–1909. *Source* Mandopoulou-Panayotopoulou (1997)

of simple volumes, flat roofs, dynamic sections: the *raumplan* they had been chasing for a decade or so. Back in Athens, CIAM members visited some newly built schools: asymmetrical compositions of pure volumes in perfect harmony with the Attic landscape. On 4 August 1933, the Greek newspaper *Neos Kosmos* reported on “Foreigners’ admiration for the new school buildings, the sign of an advanced civilization”. Pierre Chareau congratulated the local architects for finding their own way to modernity (Giacumacatos and Godoli 1985, pp. 9–10). Siegfried Giedion took pictures of some of the students running on the rooftop of a school at the feet of Acropolis, portraying the scene as true modern public space (Kousidi 2016). Reporting on his attendance to the CIAM, the Italian rationalist architect Pietro Maria Bardi (1933) praised Greece’s effort of building 3167 schools in just four years.⁵ In Greece, the school became a “master problem” (Sedlmayr 2006) providing a common challenge for architects from different generations and backgrounds, while embodying the collective meaning of architecture. To implement Venizelos’ programme, the Minister of Education Giorgios Papandreu established an ad hoc architectural department (1930–1932) including prominent figures like Aristotelis Zachos (1871–1939) and Dimitris Pikionis (1877–1968), as well as younger architects like Nikos Mitsakis (1899–1941), Kyriakos Panayotakos (1902–1982), Patroklos Karantinos (1903–1976) and Thucydides Valentis (1908–1982). Mainly graduated from Athens Polytechnic, these latter played a key part in the design team, adapting modernist principles to the Greek landscape.

Pietro Maria Bardi observed that young Greek architects identified themselves with the Ministry of Education, noticing with much appreciation the works by Karantinos and Mitsakis. According to Bardi, such a massive engagement in school projects had swept away any remains of the Bavarian style. The “Greek spirit” had

⁵The number of schools actually built changes according to the source.

penetrated rationalism and, in a couple of decades, Greece would express its own landscape-oriented architecture, full of vigour and local colour.⁶

Despite limited technical and financial means, the scale of intervention and speed of execution of the new schools marked an undeniable success, which achieved considerable press coverage attracting much contemporary and later scholarly work. According to François Loyer (1966), the school programme served as a catalyst for a movement in the making, allowing its emergence and intellectual definition. The revolution of modernism, in Greece, had a purely formal character: “An intellectual movement of young artists who found the terms of a manifesto in a political circumstance” (Loyer 1966, p. 416).

Limited funding required rationalisation of construction. The standard layout consisted of six classrooms on two separate floors, with the possibility of merging the upper units to form a lecture hall when needed. In the cold and windy northern regions, classrooms were facing south and the corridor, exposed to the north, embedded in the built-up mass. In the warmer regions of the south, instead, classrooms were facing north and the southern façade was shaded by a cantilevered corridor. Karantinos adopted these guidelines in the primary school on Kalisperi Street in Athens (1931), where classrooms turned their back to the Acropolis (Fig. 3).



Fig. 3 Photo of school on Kalisperi Street, with the Acropolis in the background. Photo by P.M.Bardi (1933) from *Quadrante* n.5

⁶Pietro Maria Bardi (1933, p. 13) wrote: “[...] today, in Greece, we are witnessing the changes that the local spirit brings to the rationalist idea: in twenty years Greece will have its own architecture of environment, of *lena*, of an entirely local color”.

Experimenting with the thermal zoning between the corridor and the classrooms, the school programme provided excellent opportunities to define energy-efficient design criteria. In addition to orientation, experiments also included building materials capable of storing heat and releasing it gradually, as well as arranging volumes for a better thermal comfort (Mavrogianni and Tsoukatou 2006).⁷ Different contexts also meant using brick or local stones as infill walls for the load bearing concrete structures.

In 1938, Patroklos Karantinos published a book on new schools,⁸ including standard layouts for small schools of two, three or four classrooms.

The modernist schools of Athens and Piraeus were presented in the opening section, followed by the four schools of Thessaloniki. Unexpectedly, two of these buildings did not comply with the modernist canon, borrowing elements from Byzantine architecture and reinterpreting the traditional Macedonian house. Some schools in Peloponnesus, in the islands, in the frontier regions of Epirus and Eastern Macedonia, featured simplified eclectic forms, bearing a tangible reference to the various architectural traditions still vital in Greece.

4 In the Heart of Rural Refugee Settlements⁹

Significantly, reporting on his journey into Greece, Pietro Maria Bardi did not overlook the critical demographic juncture: “2.600.000 inhabitants in 1907, 5.600.000 in 1921; the arrival of refugees in the aftermath of a gruelling war. Even the efforts by international organisations were not sufficient to organise such a huge avalanche” (Bardi 1933, p.15).

The great majority of Asia Minor refugees repopulated the so-called New Lands of Macedonia and Thrace in Northern Greece, in view of stabilising the borders and unlocking the region’s agricultural potential. Following social, ethnic and demographic reshuffling, large-scale reclamation works produced a radical change of the physical features and settlement network. From 1922 to 1930, a special body of the League of the Nations, the Refugee Settlement Commission, undertook this critical process. To foster mutual help and social cohesion, refugees settled by groups, often

⁷The paper gives an overview from the Rationalist period up to present-day. The paper is based on the research project ‘The Bioclimatic Dimension of Educational Buildings in Greece’ by K. Koukouzi, A. Mavrogianni, M. Tsoukatou under supervision by prof. Evangelos Evangelinos.

⁸The original Greek title is *Τα Νέα Σχολικά Κτίρια*, meaning *The new school buildings*. The book covers the period of the Venizelos government (1928–1932). The volume has been re-printed in 2019 by TEE (Karantinos 2019).

⁹This section is partly based on Vilma Hastaoglou-Martiniadis, Cristina Pallini, “Colonizing the ‘New Lands’: rural settlement of refugees in Northern Greece (1922–1940)”, in *Clara Architecture/Recherche* (forthcoming 2019), and on extensive fieldwork by the three authors, in the framework of the EU-funded research MODSCAPES Modernist Reinventions of the Rural Landscapes. During fieldworks, the authors collected maps and surveyed public buildings, private houses and farms, with a particular focus on the spatial arrangement of the settlement’s cores.

by village of origin, according to three alternative solutions: on sites of abandoned Turkish or Bulgarian villages, in new quarters adjacent to existing villages, or in newly built settlements. In early 1930s, 509 new rural communities were founded in Central Macedonia, mostly in the plain, 75 of which in the immediate vicinity of Thessaloniki. The newly established refugee settlement followed a standard layout, characterised by a uniform grid of streets surrounded by field allotments, providing for central public space and rudimentary communal amenities, such as the square with the village hall, the church and the school. The decree law on rural resettlement of refugees specified that each settlement had to “be laid out according to a simple plan and divided into lots” (Kontogiorgi 2006, p. 291) and all public buildings and sites were to be simple and uniform.¹⁰ While affiliation to the Orthodox Church was the reason why refugees had left Asia Minor, fostering a shared Greek identity among the diverse peoples of the New Lands became a priority. Rural refugee settlements clearly show the civic role of educational buildings, juxtaposed to the church at the centre of the village. Most often, the church and the school marked the intersection of the main roads, occupying two adjoining parcels. The village Axios, near Giannitsa, well exemplifies this pattern. Accessed from secondary streets, the school and the church are set on opposite sides of the main road, attracting a combination of collective spaces and playing fields. In the village of Nea Pella, the school and the church are located halfway the main road rising from ancient Via Egnatia to the higher ground occupied by the football field (Fig. 4). At Palafyito, instead, the



Fig. 4 Map of Nea Pella showing the system of public spaces (A, B, C) located along the main axis moving uphill from Egnatia Road (A) The main core (C) includes: the Church (1), the School (2), the Acqueduct (3) and the Sport Field (4). Authors’ elaboration

¹⁰According to the Government Gazette, 6/7/1923–11/7/1923, Article 6: “Regarding rural settlement of refugees” (Kontogiorgi 2006).

school—a very simple building dating back to the 1950s—marks the edge between the village and the fields.

The village of Neos Skopos in the Strymon Valley well depicts the eagerness of the community to take an active part in the construction of the main public buildings. It was established in 1923 by refugee families from Skopos in Eastern Thrace, who lived in tents and makeshift huts until the Refugee Settlement Commission drew the plan of the village and built permanent homes. “It was like repotting a plant where the roots begin to grow again, and it continues growing, developing and progressing in its new container” (Naniopoulos 2014, p. 116).

The first Church of Saint Demetrius was a simple wooden structure which served as a school during the week. As early as 1927, a proper school was built on the main square, following the conventional four-classroom layout on opposite sides of the main entrance. Sir John Hope Simpson (1868–1961), a member of the British Parliament, remarked the crucial importance of the church and the school. As the village was taking shape, the inhabitants proceeded to build a temporary wooden church, in view of rebuilding it in stone. Even before being comfortably settled, villagers commenced to agitate for a school. Their demands were so insistent that the Refugee Settlement Commission reserved a plot for the school in every village. In many villages, an extra house was to serve temporarily the purpose of a school. The Commission assisted the population either by making a grant in cash or by providing materials, with the help of which people constructed a school building by themselves.¹¹

5 Thessaloniki, Modernism’s Fault¹²

In an interview given on 4 September 1931, Minister of Education Giorgios Papanreou announced that 26 elementary schools, 6 gymnasiums and a teacher’s college were to be built at Thessaloniki (Giacumacatos and Godoli 1985, p. 6).

If *Patris II* had continued his journey further north, CIAM participants were to contemplate the ruins of the once-thriving Ottoman port city, annexed to Greece in 1912 and destroyed by fire in 1917. Cut off from its Balkan hinterland, Thessaloniki had become the capital of the New Lands whose Greek population had more than doubled by 1926. For this reason, Thessaloniki provides special observatory into modern Greek architecture. In fact, Venizelos’ programme for the new schools was part of a wider process of city reconstruction, rendered even more difficult by massive refugee settlement. In a context where foreign and minority schools had long backed cultural propaganda and territorial claims, the new school buildings became

¹¹Cfr. Simpson (1929).

¹²This section is partly based on “Colonizing the ‘New Lands’: rural settlement of refugees in Northern Greece (1922–1940)” by Vilma Hastaoglou-Martinidis and Cristina Pallini (forthcoming 2019), and on extensive fieldwork by the three authors, in the framework of the EU-funded research MODSCAPES Modernist Reinventions of the Rural Landscapes.

strongholds of a future urban topography and cultural makeup. The Neo-Byzantine style codified by French planner Ernest Hébrard,¹³ the main author of the reconstruction plan, was to qualify the future city centre, marking a clear break with the Ottoman past to recapture the city’s Hellenic identity. As documented by Karantinos’ book, two of the new schools in Thessaloniki moved away from the modernist canon. One is the Aghia Sofia school complex designed by Nikos Mitsakis (1928–1932) to host a Jewish school, a Greek elementary school and a high school. Hovering between a rational volumetric articulation and an eclectic approach, Mitsakis experimented with elements of Byzantine architecture—arch, column, pilaster strip, capital—simplified and adapted to modernist syntax.¹⁴ A few blocks away, Dimitris Pikionis built the famous Experimental School (1935–1936) which marked his shift from the architecture of the islands to traditional Macedonian architecture (Fig. 5). This “Macedonian diorama” exemplified Pikionis’s notion of “re-invention”:

Form is the result of many efforts by many souls. Architects should not invent short-lived forms, they should instead “re-invent” existing forms to meet our current needs. Form can join our souls in an ideal symbol. [...] Architects and artists should not invent ephemeral forms, rather should they reinterpret the perfect forms of tradition in line with current needs and constraints. This is not just a mental exercise, it also involves emotions. A text from ancient Greece describes three kind of creations: (a) the “backward-looking creation” indicating our link to the past; (b) the “prevident creation” indicating our way of dealing with the present and (c) the “lovable creation” indicating our feelings as opposite and complementary to logic. (Pikionis 1991, p. 6).

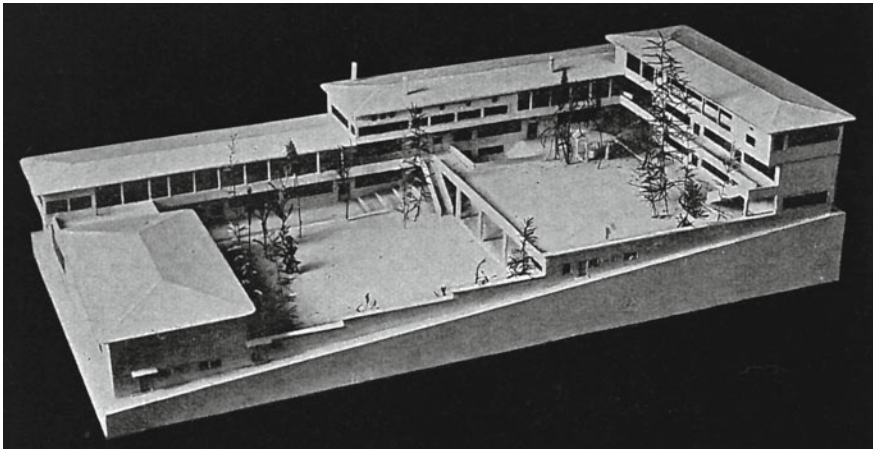


Fig. 5 Maquette of the Experimental School in Thessaloniki by D.Pikionis *Source* Karantinos (1938, p. 132), *Ta Nea Scholika Ktiria*

¹³Ernest Hébrard (1875–1933), architect, archaeologist and town planner. Hébrard received the Prix de Rome in 1904, for which he produced, as head of the French Army Archaeological Service, a conjectural reconstruction of Diocletian’s palace at Split. Hébrard was in Thessaloniki in August 1917 when the fire occurred.

¹⁴Cfr. Paioussaki (1999).

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