February of 1933, Spanish Courts: an examination of the building of State Schools

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ABSTRACT: Until 1920, to construct school buildings was a work of the city council. The Department of school Architecture of the Ministry of Public Education reported technically on projects, written by local and provincial architects and presented by the city councils, subsidized by the State Government. This system failed completely and, in view of the slowness of construction and the lack of capacity of the town councils for this task, the *Oficina Técnica para la construcción de escuelas por el Estado* (Technical Office to construct school buildings in the State) was created. It had an architect in chief, Antonio Flórez Urdapilleta, ten designer architects and head architects in each province. Among them, Bernardo Giner de los Ríos, Joaquín Muro, Jorge Gallegos, Guillermo Diz and Leopoldo Torres Balbás excelled (RODRÍGUEZ MÉNDEZ, unpubl.).
This communication tries to explain the constructive system used by the *Oficina Técnica* and why this system was the object of a widespread criticism, above all in the framework of the Parliamentary question from February 1933. It will also try to establish to what extent the conclusions of the debate during the consecutive campaigns for building schools, promoted by the Government, were decisive.

THE FIRST EXPERIENCES OF ANTONIO FLÓREZ IN SCHOOL BUILDING (1911-1916)

The "de *Patronato*" school groups of Madrid

In 1913, Manuel B. Cossío had suggested Antonio Flórez to take charge of the construction of the school groups *Cervantes* and *Príncipe de Asturias* in Madrid. It was the first experience to boost the solution of the urgent school problem in Spain's capital. Both the "de *Patronato*" school groups, built in 1913 and 1916, are from the same period as the *Residencia de Estudiantes* (Student Residence), in *La Colina de los Chopos*, a work of the same architect. The three works share common features, constructive solutions, finishes, typologies, purity, etc., which weren't present in the earlier works of the architect and, from now on, would always be the same.
In the *Príncipe de Asturias*, the width of the available land let Flórez put into practice the organization of independent pavilions attached to the land outside the boundary, to leave as much free space as possible inside for the garden. The main buildings are those for graduated boys and girls, with a "U" shape made by two parallel pavilions, with equally positioned classrooms, and the building that houses the nursery school, the dining hall and the swimming pool, all in a heterogeneous line. The case of the *Cervantes* group is quite the opposite, highly influenced by all the rules of the *Institución Libre de Enseñanza* (ILE) about the ideal organization of school buildings: two pavilions on the boundaries of the land leave space for a small schoolyard, which Flórez tried to compensate for with covered playgrounds and terrace roofs. While the classroom block has predominantly formal sobriety, the other block has a huge formal and functional complexity, especially the schoolyard facade.

González Allende Foundation. Toro (Zamora)

In the *Fundación González Allende*, Antonio Flórez gave up the free approach of the school group *Príncipe de Asturias* and moved into much more orthodox criteria of composition, which allowed him to create a more conventionally organized group: two axis that part from a small square; one of them, the teaching axis, houses the two teaching buildings.

The nursery pavilion is made up of a group of blocks with a winding perimeter facing the centre of the entrance roundabout: a baroque mechanism that, together with the ground plan, relates this design with that of the Fischer von Erlach Karlskirche, in Vienna.
The High Degree schools, a not yet built two floor building, has a ground plan in the shape of a latin cross: in the long arm are the classrooms and, in the short ones, the toilets and the stairs, respectively, emphasizing the cross with a big hall; below the cross there is a tower attached, where the laboratories are, and this has its own spiral staircase. The rhythm imposed on the classrooms facade, by organizing it into a hierarchy of two types of pilaster, would become a constant in the *Oficina Técnica* buildings.

First experiences. Constructive features

Usually, classroom pavilions consist of two bays, due to the unidirectional typology they are based on: one in which there is a corridor that leads to a line of classrooms, usually attached to their north side. In all of them there are also, as it has been already said, a series of common features, described in the following piece of text:

> Construction is as basic as possible: cement, which can easily be concrete made of stones and cement mixed with sand mortar; iron facades and beams with well fired brick to bear the frost, gathering together with cement the beds of mortar and cracks; wooden eaves, as mentioned in the plans; a wooden framework with a roof of Arabian tiles, hard-fired and as light as possible; wooden windows frames in all of the windows of a normal size and large iron frames for the windows in the classrooms. (AFGA a)
>
> Wall dimensions are specified on the plans with their elevations and, all of them are usually made of brick with footings and bonds, as indicated in the plans... The floor beams are made of iron and they are conveniently detailed in the iron distribution plan and in the budget. The frameworks will be made of dry wood from the country and have the dimensions specified in the cross section, taking into account the design plans, documents and details given by the Architect in chief. Floors will be forged with a vault. (AFGA b)

The previous texts are from the plans made by Flórez for the *Fundación González Allende*, from Toro (Zamora), because the first plans of the groups from Madrid were not kept. But the same plans were applicable to those schools. Such is the resemblance that, when the architect describes the large windows made of metalwork that light the nursery classrooms in Toro, he proposes as a model "the ones made at the school group *Cervantes* which is being built in Madrid" (AFGA a).
Probably, this is the most interesting aspect of the experimental school groups planed by Flórez; I am talking about the wide large glazed window which opens the classrooms to the outside, never seen before in a school building in our country; from now on, it will appear as a constant in Flórez's school work. The large window used in Cervantes is 3.50 m tall and 8.20 m long, and it has a glazed surface of 28.70 m2. The loading bay is a solution which would be repeated systematically from now on at the *Oficina Técnica*: two "double T" profiles linked so as to support one another with tie bolts and covered with an ornamental sheet.

1 and 2: *Cervantes* and *Menéndez Pelayo* school groups, Madrid. Outside view (Architect Antonio Flórez)

Using this kind of large window had, at that time, a long tradition outside Spain. The french rationalist schools built from the Ferry Law (1888) are one of the possible sources of inspiration for Flórez. At that time, on the other side of the ocean, the so-called Chicago School was being developed, characterized by the systematic use of metal structures on its constructions and by ripping the enclosures drastically with horizontal windows, called "Chicago's window".

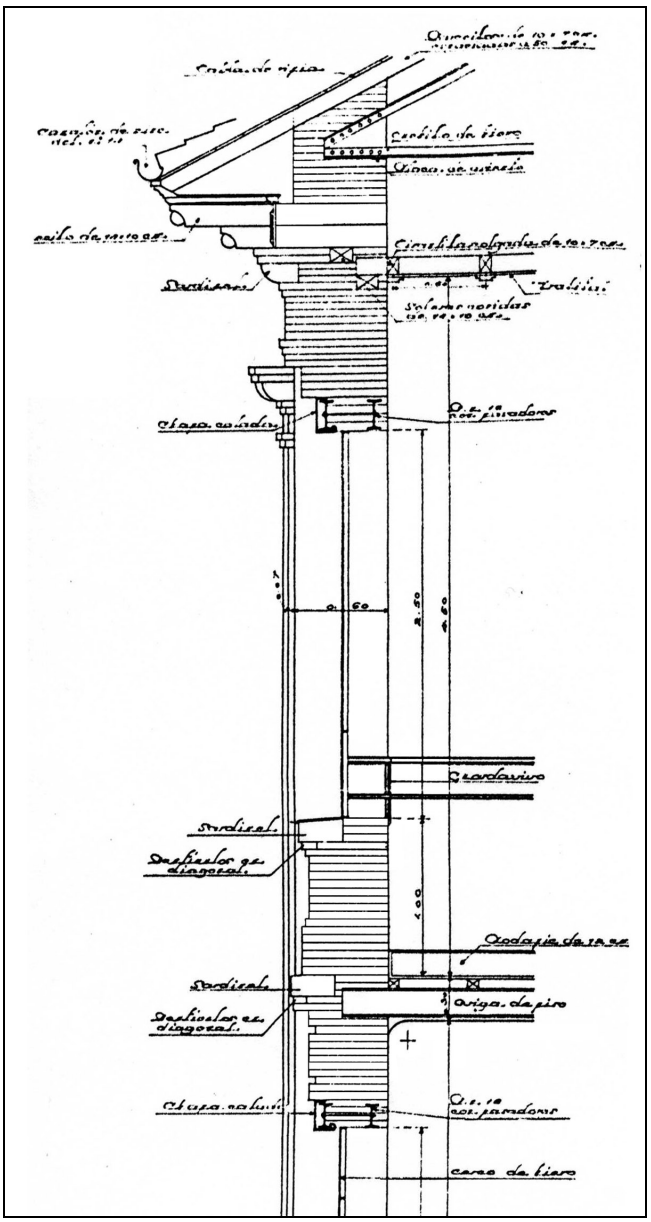
THE SCHOOL GROUPS IN THE 1922 PLAN FOR MADRID (1922-1929)

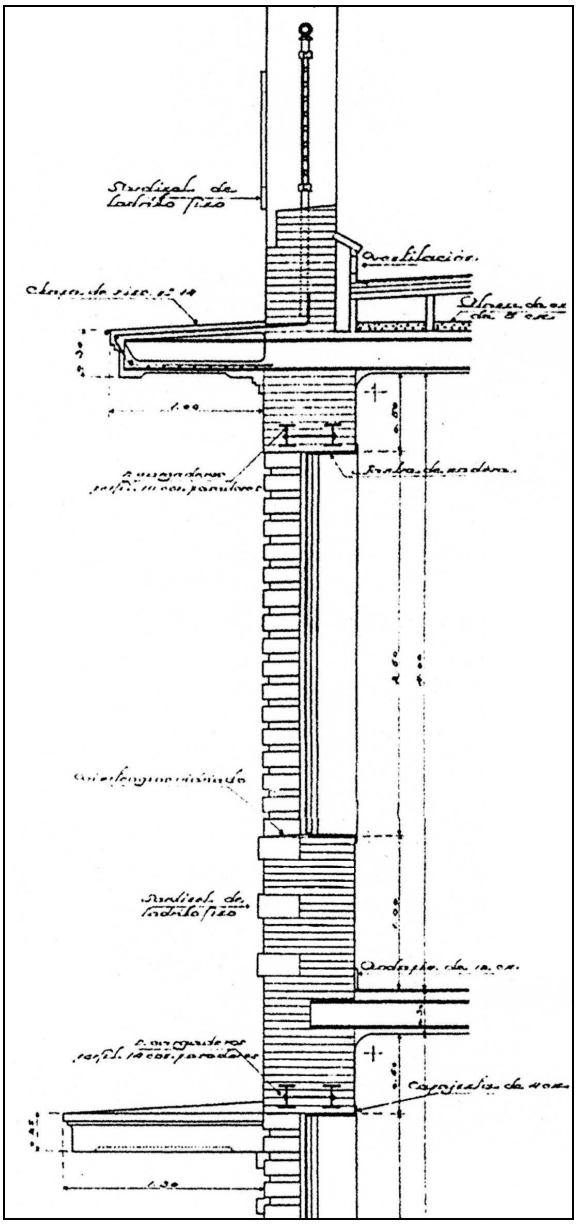
The signing of an agreement, in 1922, to collaboration between the State and the City council of Madrid, with regard to school construction, was due to the impossibility of the municipality facing such an investment on its own and, also, to the growing prominence of the *Oficina Técnica*. We could even talk about a true conspiracy of this organism, protected by the ILE, to control the final architectural product and, all in all, to hamper, whatever happened, the development of the previous plans of local architect Pablo Aranda.
The plans that served to award the works, Pablo Aranda's plans weren't implemented but replaced by other plans with different features, designed by Antonio Flórez. Flórez justified the change of plan for pedagogic reasons (the need to give the buildings larger spaces by widening the corridors) and economic reasons (adapting the groups' capacity to the situation the surface and the plots cost). This last argument was not completely valid because, when being inaugurated, the capacity of Flórez's groups was similar to the capacity of Aranda's groups.
According to Flórez's own explanation, there was a first wave of buildings (*Menéndez Pelayo*, *Jaime Vera* and *Concepción Arenal*) that, starting from simple plans, were finished and defined as they went along; during this process some new experiences were had and they were put into practice on the second wave (*Pérez Galdós*, *Joaquín Costa* and *Pardo Bazán*). This is an excessively positive and idealistic interpretation of a way of acting that borders on improvisation, above all because the first wave buildings hadn't been implemented when the second one began, it being, therefore, impossible to obtain real conclusions about how well they functioned. The author classified the groups into three types: maximum, reduced and special, in accordance with their own autonomy level: while the maximum type includes all the offices (*Menéndez Pelayo*, *Jaime Vera* and *Concepción Arenal*), the reduced one needs pavilions for additional education (*Pérez Galdós* and *Joaquín Costa*); the *Pardo Bazán* building represents a different type, thought up for the central area plots.
The original economic forecast was exceeded with the final liquidations and even with additional budgets, until it had achieved a figure which exceeded the tendered budget by more than 27%. This is the fundamental reason for the delays that accumulated during the works, as the debts owed by the city council were not paid off until 1930.

The school groups in the 1922 Plan for Madrid. Construction analysis

The plans of the group drawn up by Flórez will never have the qualities of such plans, as they were arranged as changes to the invitation to tender plans, made by Pablo Aranda, despite the enormous differences existing between them. So, we have neither memoirs, nor documents, nor the usual documentation attached to a conventional piece of construction. The plans are not complete either as, in general, they just include elevations and ground plans and not constructive details. So, to understand the constructive procedures used, we have two kinds of sources: the final results, which can not always be analyzed, and other plans from the *Oficina Técnica*, created at that time and with similar procedures; the memoirs from these give invaluable information, perfectly applicable to the Flórez's Madrid groups, in view of the *Oficina Técnica*'s tendency to repeat constructive solutions. In fact, Joaquín Muro's plans for Valladolid are outstanding, as they include sections and constructive details (3 and 4).
Walls, in general, are from a brick factory and measure 28 x 14 cm taken with cement mortar. Facade bases are made in a masonry factory, as well as the door jambs and the outside and inside steps. The facade faces have been carefully grinded and caused sores. At the school groups of the province of Valladolid, the facade's joints stick out of the plan and they were originally painted in white "in order to look like the old constructions of the region" (AGA b).
The main structure is the mixed structure, that is, the facade walls it comes from the brick factory whilst in the longitudinal beams it uses a metallic frame. The metallic framework is made of supports, made of reinforced profiles of laminated iron with a "U shape" and beams in "double T". Its use was justified because of its quick and easy implementation, as opposed to the central load wall. The mixed structure was used by Flórez for the first time in the *Menéndez Pelayo* group, one of the six included in the 1922 Plan, although not all over the beam but only in one of the wings, the one in the stretch coinciding with the dining hall. He could have taken the idea from the first version of this group, where Pablo Aranda had planned the same constructive solution to turn the dining hall into a bright place. The same procedure was used in the *Pardo Bazán* and *Joaquín Costa* groups, the structure being made of reinforced concrete, in this case (an exceptional case in *Oficina Técnica* production). In most of the plans from the 1931 Plan, the central beam is made as it is described in the previous paragraph -in fact, the text is taken from the plan of a group belonging to that Plan- even when adding brightness to the ground wasn't required, which makes us think that the reason for its use was not that, but rather its quick and easy construction.
Using large glazed windows at the classroom's facade could be thought of as a third phase in the method begun by Flórez with the nursery schools and continued through the "de *Patronato*" school groups. From only one floor at the nursery schools, they have gone to two at the "*de Patronato*" groups (1) and to three at the *Menéndez Pelayo* school group (2). The excessive dimension of the large window or the limited section of the middle buttress, or both at the same time, caused the distortion and countless cracks that required, in the nursery school, from the *Fundación González Allende*, case, the reinforcement of spaces through middle columns. This negative experience, together with the fact that another floor was added, made Flórez increase the buttress section and, therefore, reduce the large window light, diving it into three spaces, placing two

columns of laminated iron. This way, the buttress and large window widths go from 1.20 and 8 meters in the *Cervantes* to 2.50 and 7 in the *Menéndez Pelayo* group. Bearing in mind that this decision has its origin in the need to take care with construction, it even improves the composition of the facade, on which the architect imposes the mixture of two orders: the main one, which coincides with the division among classes and which covers the three floors, and the secondary one, made up of the holes mullions.



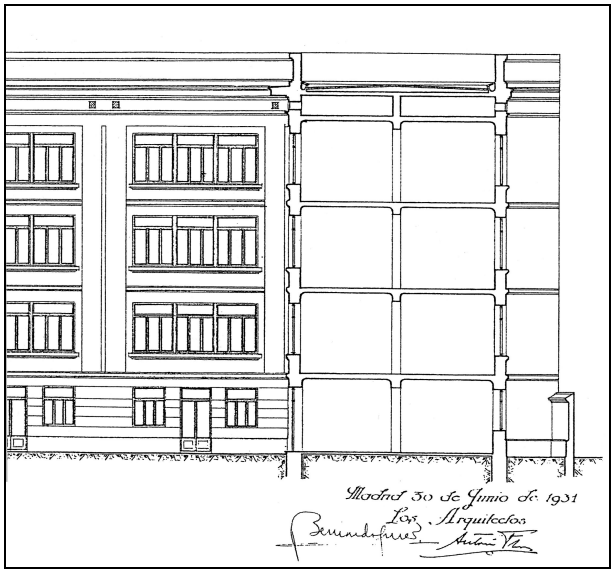


3 and 4: *Joaquín Costa* and *Frutuoso García* groups, from Valladolid. Constructive section. (Architect Joaquín Muro)

In Flórez's previous plans, the structure of the cover was made of wood and, together with the infiltration humidities, caused much pathology. The change of criterion about this matter took place in the 1922 Plan groups, where the cover framework was made of trusses, made with laminated iron profiles: "The cover frameworks are composed of iron knives, made up of angular profiles with clinched sheets and belts, double T profile. On the iron belts will rest the wooden battens that, in turn will support the boarding which will support the Arabian tile cover" (AGA b).

The system for ensuring water drainage from the cover is a really important aspect of the buildings planned by Flórez because, not in vain, its choice affects the eave aesthetics in a crucial way. The most effective means of solving the problem consists in dropping the water freely, without channelling it through gutters or drainpipes; this way, the traditional aspect of the eave was guaranteed and the maintenance needed was minimal, therefore it was the ideal system for buildings in a more rural area. The second procedure is the one most used on the buildings in the Flórez Madrid groups; in view of the impossibility of pouring water directly on the street, the architect chose to build drainpipes into the facades and pick the water up off the mud flaps with a hidden file situated in the vertical line of the facades external side.

On the balconies, on the forged roof, a terraced roof has been made, leaning on partitions and leaving an aired chamber. The top follows the slopes thought to pick water up and it is made of three layers of ceramic long thin brick, the first one made from plaster and the other ones, crossed, made from mortar. These balconies have been made with a free expansion and they are soldered, as in the case of the airing and expansion peak, which is made up of Catalonian tiles, received by cement mortar (AGA c). In the next groups, the 1931 Plan, the forged cover was doubled, a solution noticeable from the outside, through the airing orifices under the eave, characteristic of all of them (5 and 6). In the 1922 Plan balconies, the solution had not got this original doubling of the forged cover, which seems to be an innovation introduced in the next plan as an answer to a negative experience, from a thermal point of view, suffered in the first one.



5 and 6: *Lope de Rueda* school group, Madrid. Section and outside view (Arch. Flórez and Giner de los Ríos)

THE CRISIS OF THE OFICINA TÉCNICA AND THE WIDESPREAD CRITICISM OF ITS CONSTRUCTIONS

"For the socialists and the people of Madrid!"

Luis Bello's campaign, aimed at influencing the school construction policy of the Ministry of Public Education goes back to 1932; on the fifth of March, a journalist placed in the newspaper Luz an article entitled *Notas sobre instrucción* (Notes on Education) (BELLO, 1932) where he asked for new technical-hygienic rules and where he warned that, in accordance with the new regulations, schools should cost half the current price. To achieve this aim, Bello proposed to reduce demands, to make the application of the law more flexible and, in short, to move towards a more efficient school, with the qualities of solidity, cleanliness, brightness and space. The author was specific about his thoughts when he introduced this slogan: A school will never be perfect if it costs just a cent more that it should cost. For him, the *Oficina Técnica* school answered to a concept preceding the 1914 war: the Henri Baudin's concept already outdated and hardly in agreement with what was being built in Europe. Four days later a large group of Madrid architects answered to this article with a document supporting Bello's opinions undersigned by 27 technicians. Among them there were the most distinguished figures of the capital professional scene (among them it is worth mentioning Fernando García Mercadal, Rafael Bergamín, Manuel Muñoz Monasterio, J. M. Rivas Eulate, Luis Lacasa, Luis Blanco Soler, Secundino Zuazo, Fernando Salvador, Juan de Zavala, Manuel Vías and Teodoro de Anasagasti).
In January 1933 Bello published another well documented article, where he was insistent about the causes of the wasteful spending that, in his opinion, was occurring during constructing the Madrid school groups, started in 1931. Under the title of "For the socialists and the people of Madrid!", the content of the article is broken down: "The bad example of Madrid. For every two million spent, one of them is wasted. Waste explanation. Construction mistakes. Eight kilometers of cornices" (BELLO, 1933).
Undoubtedly, Bello, ignorant about construction, couldn't write such a conscientious study by himself. Fernando García Mercadal, a distinguished figure of the avant-garde national architectural scene, was possibly the anonymous architect who provided Bello with all the necessary information for his article. García Mercadal bordered on being a dwarf and the press close to the socialist Government referred thoughtlessly to his handicap: "(...) And with a little help from some technician whose height, apparently, has not been an obstacle to measure the cornices of the eighteen big groups that are being built in Madrid (*El socialista*, 1933). This leads to the thought that his collaboration was, even then, known or, at least, suspected. In one interview in 1981, García Mercadal admitted that he had given clandestine information, from his position of local architect, to the *GATEPAC* journal (FERNANDEZ POLANCO, 1990, p. 28). It is not a confession of his collaboration with Luis Bello, but it comes close to it.

In his article, Bello focuses his criticism on six deficiencies widespread among the *Oficina Técnica* school buildings. To make up for them would mean, in the author's opinion, to reduce drastically their cost, without diminishing the building's quality. The building's excessive free height, the disproportionate surface of the area for the lobbies, corridors and stairs, the adoption of an inappropriate structure, the excessive use of cornices and eaves, the duplication of the air flow chamber at flat covers and, finally, the bad way the classrooms were facing (north) are for Bello the main causes of the increase in costs. Following this explanation there are some paragraphs that Bello, probably advised by García Mercadal, devoted to refuting the structural system and the flat covers solution used by the *Oficina Técnica*:

> The adopted (structure) is the most ridiculous and anti-economic one that could be chosen. In both spaces, one for the classrooms and the other for the corridors, the intermediate supports are made of a metallic structure and the outside facades, of hard brick; so, in the middle, where in 40 meters there are only four or five small holes of 1.20 m wide and all the rest is blocked, there are metallic supports and, in the outside facades, where everything is empty, with large windows that exceed the 5 meters, there are buttresses from a hard brick factory. So, these facades filled with beams for the large windows, are indeed made of solid iron. The structures were thought of constructions with large windows. (…) Every school group should be made either completely with a metallic structure or a reinforced concrete one. (BELLO, 1933).

> Another invention is the construction of a triple (air) flow chamber under the balconies. They thought that one of 40 cm, under the terrace roofs, and another one of 15 cm between the board and the thermal insulation between the beams were not enough. So, built another 1 meter high (air) flow chamber in every group, which means an increase in the cost of 1361 pesetas per classroom, calculated, as it used to be, according to the value of the cubic meter built. This figure is hardly surprising because that chamber needs a whole floor of joists and beams, alongside the manufacture of the bricks. The right cork thickness, seven pesetas the square meter, would protect this national production sector, really neglected, and would be cheaper. (BELLO, 1933).

The journalist and his adviser weren't wrong with their prejudices. The reinforced concrete structure was being used as the norm in all the important Spanish capitals. In Madrid, the *Instituto-Escuela*, a school building designed by Arniches and Domínguez apart from the *Oficina Técnica*, and, especially, the series of markets designed by the architect Javier Ferrero (BALDELLOU, 2005, pp. 177-218), are the ones that stand out.
The flat cover solution suggested by the journalist was a different thing. The use of the flat cover was, at that moment, much less mainstream than the traditional solution, the so-called "*a la catalana*". Not counting one of the middle chambers, this is the one Bello criticizes. Spanish construction didn't manage, at that moment, to implement a system that coincided, more or less, with the one used nowadays. It seems that this system was already applied outside Spain, or at least that can be deduced from the next text, from a German book located in the Library of the School of Architecture of Madrid: "Usually, covers have on the forge thermal insulation between the beams, a layer of slope formation and a waterproof sheet" (VÖLCKERS, 1929, p. 38).

The Parliamentary question

Between the 16th and 28th February, 1933, at the very heart of the Spanish Courts, state school building was the target of a parliamentary question addressed to the Ministry of Public Education. This initiative came from the Radical Party, the main opposition to the coalition government headed by the Socialist Party, which held power since the accession of the Republic. Radicals run within the framework of the Government "obstruction", a campaign supported by different educational and architectural sectors and by the press.
Both Bernardo Giner de los Ríos and Luis Bello were on the parliamentary register and, even being of different parties, both were included in the coalition government. As co-author, together with Antonio Flórez, of the plans under examination, Giner was obliged to answer at the Chamber to the criticisms that were already known, presented there by Bello.
Deep down, with regards to the buildings structure, the architect agreed with the journalist because his explanations were based on elements not related to the building itself. The first reason given to justify the use of the criticized structural system was the greater speed it gave, both in the planning phase and in the construction itself, just when there was greatest urgency. The second and most important reason, was based on the idea of construction as a way to employ workers, in a moment of deep economic crisis: "And in these circumstances we thought that the quickest structure to provide employment to builders, factories and lamination workshops (was) to build with iron and brick, and that was the reason" (*Diario de Sesiones*…, 1933, p. 11343). To show the appropriateness of Giner de los Ríos' view and its social significance, one only need to look at the initiative of the General Confederation of Labour of France. This labour organization suggested, through its National Committee of 1935, creating a control organism to guarantee that the contracting done by Public Administration would be made according to "its social profit and its efficacy in the fight against forced unemployment" (*Tiempos nuevos*, 1935).
To the criticism relating to the balcony construction system, Giner answers with the same kind of reasons:

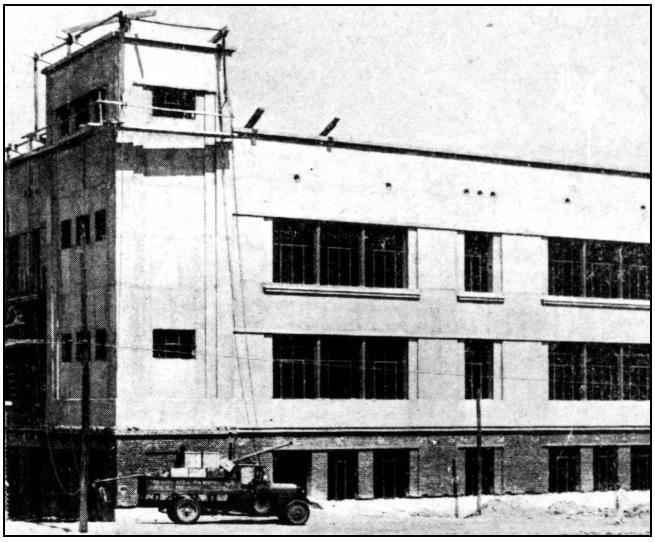
> As regards the (air) flow chamber, what kind of discovery is this? The air flow chamber, as S.S. knows, is completely necessary and I did not invent it. The air flow chamber, besides the chamber that all balconies have, made up of small partitions and its airing, is a double insulation chamber that prevents those balconies, with hundreds of square meters of surface, causing insupportable changes in temperature in the classrooms

below, either in summer or in winter. Where does S. S. get the idea that this is an innovation, that is, an invention? (Diario de Sesiones, 1933, p. 11343)

The school groups planned after 1933 lost this undoubtedly beneficial, but economically unadvisable, defence against the high temperatures cause by the cover.

CONCLUSIONS

The constructive system used by the *Oficina Técnica* to construct school buildings was, until 1936, the one that Antonio Flórez, architect in chief of the *Oficina Técnica*, had suggested during the construction of the school groups in the 1922 Plan for Madrid, that in turn were based on the so-called "de *Patronato*" school groups, from 10 years ago. During three decades, school buildings were built all around Spain almost whit the same structural and constructive systems, changing only the outside aspect of the buildings.
Despite its unquestionable importance, the Parliamentary question about school construction hadn't got a big significance outside the boundaries of the Congress; the debate was not so important because it was made between two other debates: the Question about the *Casas Viejas*' incident, a bloody repression, headed by the Government, of an anarchist uprising that has taken place in that Andalusian village, and the discussion about the *Ley de Congregaciones Religiosas* (Religious orders' Law). Despite the fact that several authors presented their results in agreement with the government views (which means that Bernardo Giner and the Minister Fernando de los Ríos acquitted themselves well in the debate), the reality following, 1933 and 1936 Plans for Madrid, refutes this conclusion.



7 and 8: G. E. Alfredo Calderón. Plan (1931) and Construction (1933). (Architects Flórez and Giner de los Ríos.)

After the Parliamentary Question about the school buildings, some of the constructive solutions more discussed within the Question were rectified, such as the eaves, removed from now on, both in the new plans and in the buildings being constructed (and planned with that protection) (Figs. 7 and 8). However, the mixed structure, central metallic beam and stone outside walls, kept being used in most of the buildings planned after 1933. The most important change affected the outside aspect of the groups, especially in the later ones, recovering the brick facade, the simplification of faces and the use of more avant-garde typologies. All this was also due to the younger architects' influence who, progressively, took charge of the *Oficina Técnica*, because Antonio Flórez and Bernardo Giner were busier with other activities.

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