

About the rediscovery of the *tapia valenciana*

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ABSTRACT: The so-called *tapia valenciana* is a particular type of brick-reinforced rammed earth wall used in the area of Valencia between the 14th and 17th centuries. Replaced by brick or rubblework walls in the 18th and 19th centuries, the technique was forgotten until the 1980s. The text addresses pioneer contributions in this field with professionals like Manuel Galarza, Fermín Font and Pere Hidalgo, as well as some early approaches to the restoration of rammed earth.

1 FOREWORD

1.1 *Tapia valenciana* technique

The technique known as *tapia valenciana* is a variant of rammed earth wall reinforced with courses of bricks, visible from the outside. It was particularly successful in the Valencia area, and it is likely that the invention arose in these lands during the Middle Ages. Its origins can be traced back to the mid 14th century and it continued to be the main building system until the early 17th century, when brick or rubble gradually began to replace it (Cristini & Ruiz Checa 2009). After that, it fell into disuse in urban areas, and we can assume it was virtually extinct at the time of the construction boom in the 18th century.

The *tapia valenciana* wall has resistant qualities far superior to a conventional rammed earth wall. Fray Lorenzo de San Nicolas, in his *Arte y uso de Arquitectura* (1639) described it as a “very

strong structure” and constructions of this type that have survived to the present day are evidence of this. However, its main problem is deterioration caused by water infiltration, as in conventional lime-washed rammed earth walls.

The purpose of this paper is not to discuss the particularities of this technique or the process of its replacement by brickwork, a subject on which Professor Valentina Cristini has been working for many years. Our aim is to reflect about its disappearance and recovery in the last decades of the 20th century.

1.2 *Abandonment and mistrust*

As we mentioned above, it was in the late 16th and early 17th century that the first brick structures were built in the city of Valencia. A remarkable example is the old church of San Andrés in Valencia, now San Juan de la Cruz, built in the first decade of the 17th century. There, the main façade is made of brick and the side walls are made of reinforced rammed earth. Mid-century residential buildings are executed entirely with brick walls.

This process was already fully developed in the 18th century, when an important first stage of replacement of buildings took place in Valencia.

The agricultural revolution and especially the prosperity of the silk industry led the city to a process of growth and improvement, in which many of the old medieval buildings were rebuilt. The change in architectural tastes in the 19th century would continue with the demolition of the old rammed earth architectures, or hiding them under mortar coatings. Urban renewal and change of alignment to widen streets contributed to the renewal of many façades, with only party walls



Figure 1. Unrestored *tapia valenciana* wall (San Miguel de los Reyes, Valencia).

surviving. Monumental and residential in small towns fared better.

1.3 *Oblivion and recovery*

Loss of traditional skills in the second half of the 20th century and the new training provided by Schools of Architecture focused on new materials led to complete neglect of a technique that was still known by some old master builders, especially in peripheral areas. It is true that, when acting on historic centres, “earthen” party walls repeatedly appeared, usually very patchy and prone to collapse if the site had been long exposed to rain. These walls, spurned for their apparent weakness, were covered with new walls in framed structures or, when possible, demolished to gain a few inches for the plot.

More complex was the subject of the intervention on heritage buildings. In the 18th and 19th centuries there had been many interventions focused on renovating the exterior of the buildings in which the original structures remained hidden under plaster and other claddings. The modern approach to restoration, based on the principles of the French tradition, was primarily intended for monumental architecture, characterised by the use of stone.

A typical example was the intervention of what is known as the Palace of the Generalidad, initiated in the twenties by Vicente Rodríguez. The building, with stone façades, was preserved almost intact in the tower, although it had been greatly altered at its side elevations. Restoration, which lasted for several decades, recovered -or rather reinterpreted- the old-style doorways, windows and galleries, restoring the medieval appearance lost centuries before. The courtyard was better preserved, but as it was a minor space the walls were made of rammed earth and not stone, which led to its demolition and reconstruction in brickwork. This interesting fact was brought to light during the preparation of the Master Plan and, although it was not documented, there are some urban photographs where you can see the partial demolition.

Without going to such extremes, mistrust of the bearing capacity of the *tapia valenciana* has continued to exist until relatively recently. For the work of Scala Palace restored in the 1980s, a metal structure was embedded in the original walls. It is true that the MV standards (later NBE) already required a particular structural behaviour and load bearing capacity in public buildings, but the thick walls of the building would probably have been able to support the required weight without problems. This distrust of rammed earth walls would have much more serious consequences when deciding to perform complete or partial demolition, as in

Cervellón Palace or the House of Cerveró, which probably would not have taken place if the walls had been made of brick or stonework.

We must recognise the weakness of the walls of buildings without a roof or simply in areas seriously exposed to moisture. Furthermore, the reduced bearing capacity, measured by Proctor compaction tests in a new wall, is virtually impossible to assess in an old wall affected by water leaks. Uncertainty makes it easy to understand the fear or lack of security of the architects responsible for its restoration. In that sense, we appreciate even more a series of contributions that have helped to see this type of construction in a different light.

2 SOME NAMES IN THE RECENT HISTORY OF THE *TAPIA VALENCIANA*

2.1 *The previous Spanish situation*

Recovery of the *tapia valenciana* technique occurs within a broader context of valorisation of vernacular building traditions that took place from the nineteen seventies and especially the eighties.

The beginning of this change can be located in 1973 and the Oil Crisis, which could be linked to the



Figure 2. Collapsed *tapia valenciana* walls in a 16th century building (“El Relpá” in Alquerías del Niño Perdido, Castellón).

criticism of Modernism, which began several years before. In this line we can trace the valorisation of the Spanish vernacular architecture, represented by Carlos Flores (*Arquitectura Popular Española*, Madrid, Aguilar 1973) and Luis Feduchi (*Itinerarios de la arquitectura popular española*, Blume 1974). Both of them briefly discussed the technique of the rammed earth wall.

The Oil Crisis of 1973 would also mean the beginning of interest in what we now know as bi-climatic architecture. The pioneering book in this line would be *The Autonomous House*, by Brenda Vale, published in 1975 and translated into Spanish in 1977 by Gustavo Gili. Several books related to this alternative new view of architecture were brought out by this publishing house, and especially Blume, greatly concerned with these issues, in the following years.

In 1979 Blume brought out *Shelter* (translated as *Cobijo*) a compilation of texts written by several authors under the supervision of Lloyd Kahn, describing vernacular construction in different regions of the world. Spain was represented by the rammed earth technique. The book was first released in 1973, making it perhaps the first work concerned with self-construction. On that date, the primary bibliography available was an old article by Gustavo Fernández Balbuena, published in the 38th issue of the journal *Architecture* in 1922, and entitled: *La arquitectura humilde de un pueblo del Páramo Leonés*.

It was in France that research on earthen architectures had the widest readership. The work of Patrick Bardou and Varoujan Arzoumanian, titled *Archi de terre* and translated as *Arquitecturas de adobe*, should moreover be noted. Originally issued in 1978 by the prestigious French publishing company Parenthèses, it was translated in 1979 by Gustavo Gili in the collection *Arquitectura y Tecnología*, directed by Ignacio Paricio. This book contained a large repertoire of vernacular building techniques in earth, both in Africa and America, as well as proposals for its use in climatically efficient new buildings. Two anecdotes from the Spanish edition: first, there is nothing about European vernacular architecture, although in some regions of France rammed earth is used; second, the translator used widely the Gallicism *pisé-de-terre* to refer to the work known in Spain as *tapia*.

At the same line another important referent, at least in the Valencian area, was the exhibition *Arquitecturas de tierra* organised by Jean Dethier, from the Centre George Pompidou, held in the Lonja in 1983 and sponsored by the City Council and the Ministry of Construction and Urban Development. This exhibition, which was widely visited by the public, presented such important issues as the strength of these structures, their

wide geographical diffusion and problems for their conservation.

In the Spanish area the creation of the *Centro de Investigación de Técnicas y Materiales Autóctonos* in Navapalos (Soria) the following year should be noted. It has since organised courses and meetings in an attempt to spread the use of vernacular techniques, and experimentation in the search for a sustainable, low-cost architecture. Attendance of young architects and architectural technicians at these activities gave rise to a new awareness nationwide.

In parallel with this revision of popular architectures it became necessary to know the techniques for their restoration. At university level, the pioneer work of EUATV (Escuela Universitaria de Arquitectura Técnica de Valencia) professor Fernando Benavent, should be noted; since the academic year 1977–78 he has imparted a subject focused on architectural intervention techniques, awakening the sensitivity of several generations of architectural technicians. Not so in the case of the architects, whose training was entirely focused on new construction.

It was from the eighties onwards, with the organisation of regional governments, that multiple institutions were created for the preservation of historical heritage, understood in a broader sense than the traditional concept of the monument. In the Valencian area, the need to rehabilitate buildings for local government management and the work of the Dirección General de Patrimonio led to the multiplication of all kinds of restoration works, directed by young architects who had no specific training in academically underestimated historic architecture.

In these circumstances, the presence of veterans and experienced builders is crucial. Some of these young architects, now recognised as experts in historic construction, still remember some singular characters whose judgment and experience they could trust. A prominent example was Tirso Ávila, from the Minguet Company, who was one of the few persons with experience in rammed earth walls at that time, thanks to his training in a town of *La Mancha*. However, this knowledge acquired on site had almost no diffusion.

We must conclude that in the previous cases, when speaking of the rammed earth wall or *tapia*, we have referred to the most widely used techniques, but not the local variety called *tapia valenciana*, which is the subject on which we are now focusing.

2.2 Manuel Galarza and the rediscovery of the *tapia valenciana*

If you were to write a history of the restoration of *tapia valenciana*, one name that should not be

missing is that of Manuel Galarza. Galarza is one of those rare examples of a person who has managed to combine professional practice as architectural technician with scholarly research in archives, which also has allowed him to interpret documents from a construction point of view. He has made many contributions, among which the most important has perhaps been the rediscovery of the *tapia valenciana* and its value.

As he himself states (Galarza 1996) the origin of this research dates back to 1983, when he was commissioned to restore the Capuchin Monastery in Ollería. Looking for the building's original documentary sources, he decided to explore the Archives of Notarial Protocols of the Corpus Christi College, where he found information about the arrival of the Capuchins in the Kingdom of Valencia. The Ollería contract did not appear, but he found information on other buildings, with references to *tapia valenciana*.

Contracts for the construction of the church of the Jesuit Monastery (1595) and the Capuchin Monastery in Valencia (1597), signed by the master builder Francisco Antón, made explicit reference to the fact that the walls should be made of *tapia valenciana*, detailing its thickness as well as some details for its execution.

Both works have been demolished, so that there was no way of verifying directly in the specifications of the contracts. However, Galarza's training and his great building experience enabled him to identify documentary references with what he had found in Ollería and restore the technical execution process, similar to the common rammed earth wall, but adding a reinforcement of layers of bricks facing the quarter-deck board.

Although his research dates back to the eighties, it had a rather limited diffusion until the submission in 1996 of a paper on the subject at the *Primer Congreso Nacional de Historia de la Construcción*, a text that at present is an indispensable part of the literature on *tapia valenciana*.

2.3 *Fermin Font and Pere Hidalgo: The recovery of the technique*

If Manuel Galarza had the merit of recuperating the *tapia valenciana* from a documentary and restoration standpoint, we must thank Fermin Font and Pere Hidalgo for the recuperation of the building tradition, which they reflected in a book.

Fermin Font, also an architectural technician, became interested in traditional rammed earth construction in the mid-eighties. He was a member of the Navapalos Research Centre in 1985 and later, between 1987 and 1991, he combined his professional activity with collaboration in a workshop for the restoration of the Real Santuario de la

Fuente de la Salud in Traiguera, and Vall de Uxó. During this time he took the opportunity to learn and perfect the craft of building *tapia* through contact with an elderly Forcall builder. In the nineties he cooperated with the Ministry of Foreign Affairs and various NGOs to carry out works in developing countries.

In 1990 Fermin Font and Pere Hidalgo published *El tapial—una técnica constructiva milenaria*. The book, published by the Colegio de Aparejadores y Arquitectos Técnicos de Castellón, may not have had all publicity it deserved, but it is the first monographic work published in Spain on this issue. Recently, in 2009, the same authors brought out another book called *Arquitecturas de tapia*. The pragmatic component of both works is evident if we note that the former was accompanied by a video and the latter by a CD.

The current study is not limited to the *tapia valenciana*, but obviously this technique of widespread local importance has a prominent place in his work.

3 THE AESTHETIC VINDICATION

3.1 *The case of the Almudín in Valencia*

In the mid nineties, after the above mentioned contributions and the experience of many restoration works, the *tapia valenciana* was beginning to be a recognised technique. However, from the point of view of Galarza, interventions realised during these years had been quite unsuccessful, due to ignorance about the technique, inadequate training of the workers or an excessive mimetic-decorative intention:

“Perhaps the most blatant case, fairly recent, is the restoration of the façades of the *Almudín* in Valencia [...] where, after restoration, the wall has become, a merely decorative surface of poor construction value. Concentrating the entire restoration of the execution on a simple surface finish, ignoring all the rules of good construction with brick, and not retrieving the hard-to-recover rammed earth technique not only distorts the essence of the building technique but also annihilates all the cultural value of the monument itself” (Galarza 1996).

The work carried out on the *Almudín* (a former grain warehouse) in Valencia between 1992 and 1996 by a prestigious team of architects is a good example of the widespread rehabilitation criteria put into practice in Spain during the last decades of the 20th century. This is a very correct work from the point of view of project design, even though some bold decisions were made that might be questionable from a conservational approach to the discipline of restoration.

The works on the building were focused on the restoration of its medieval image after recovering openings and eliminating added elements: a roof in poor condition, the 18th century rendering and other non-original parts, such as a gallery of arches and a stone pavement, possibly made in the late 16th or early 17th century. After replacing the wooden structure, only the primitive walls remained, combined with stone elements and wall paintings dating from the 17th century.

The “discovery” of the technique of *tapia valenciana* when drafting the architectural project became the leitmotiv of the intervention. The interest aroused by the aesthetic value of the wall is clear, for example, in the manner in which the authors report the technique of the *tapia valenciana*:

“After compaction and curing, demoulding produces a textural effect due to the abundance of mortar on the bricks in the wall, which causes a plastic quality characteristic of the surface material, with random effects of unquestionable aesthetic value” (Llopis 1996).

The restoration of the rammed earth wall included different interventions, depending on the degree of deterioration of the material:

[...] And finally repairing the slightly damaged crusts, or the resulting surface after pitting the walls, covered with a widespread gypsum, lime and sand rendering, which may have been applied at the end of the 17th century on walls that may already have had localised damage and, as a general criteria, on the façades, since large parts of the interior has preserved to this day the original specific texture *tapia* intact, above all, and served from the time of drafting to identify the performance criterion for the recuperation of the characteristic textures “(Llopis 1996).

Again we note the architects’ concern about the shades of the materials used in the entire building.



Figure 3. *Tapia valenciana* wall restored with a protective coating (*Almudín*, Valencia). Here two walls from different periods can be perceived.

In the case of the rammed earth wall, furthermore, a protective coating was selected.

“On the finished surface, depending on the texture as a result of the building procedure, it was decided to apply a protective coating to ensure the textural quality obtained, waterproofing compatibility with optimal levels of water vapour diffusion, protection against the aggressive effects of the atmosphere and carbonation and, finally, durability and adequate maintenance” (Llopis 1996).

The idea of protecting the wall was not new. Traditionally, it was fairly common to apply a protective whitewash on brick or even stone walls.

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Galarza’s criticisms are now more understandable. The recovery of the external image and the closure of some openings had led to the restoration of the texture of the wall with repairing mortar, even faking its characteristic finish. It is common practice even in the restoration of stone, especially in severely damaged areas. But it is true that it somehow a betrayal of the traditional technique. The second point concerns the homogenisation of the facing and sealing of joints between different construction phases, which now prevents a clear stratigraphic reading. Also in this sense we can understand it as a decision aimed at obtaining a unitary, unfragmented aspect, more architectural than archaeological.

3.2 Fake *tapia valenciana*

The consequences of the restoration of the *Almudín* were important. From that moment onwards, people began to take an interest in *tapia valenciana* and its value as a typical feature of the historic architecture of Valencia. Many rammed earth walls have since been restored, more or less successfully. We will not go into these issues, but we think it is worth mentioning some singular cases where image has prevailed over materiality.

The most striking and paradigmatic example is probably the rehabilitation of the headquarters of the *Gremio de Carpinteros* (Carpenters’ Guild) in Valencia, whose design dates from 1996 precisely. It was a delicate operation, because the main hall was divided into two floors and part of the building was converted into dwellings in the 19th century. Inside, the retrieval of the old guild chapel space is remarkable, preserving the original gallery but removing the posterior framework. However, the most daring feature is the work on the façade. Apart from the curious voids, forced by joining the upper balconies with the lower windows, or the peculiar high front ends, the strangest thing about this building is precisely the surface treatment.

From a certain distance, a *tapia valenciana* wall in a brown tone, similar to that of *Almudín*, is visible. In any case, the excessive separation between the rows of brick and the shade are unusual. However, when we come, we realise that the effect is caused by a rendering on which a false finish of bricks has been applied. The building dates from the 16th century and its walls are really made of *tapia valenciana*, as we can see in some areas. However, it is clear that in this case it was decided to keep the original material, probably in very poor condition, hidden and to simulate it on the surface as described above.

We suppose that the intention of the designer was to evoke the original wall without deceit, with a modern technique fully recognisable, according to the tenets of critical restoration. The result, in any case, is unique and is definitely a factor that contributes to the success of the works on the *Almudín*.



Figure 4. Fake *tapia valenciana* wall: an old wall coated with a textured rendering (*Gremio de Carpinteros*, Valencia).



Figure 5. Fake *tapia valenciana* wall: new wall coated with a rendering into which the bricks are inserted (Alquería de Pinohermoso, Burjassot, near Valencia).

In an intermediate line, we might consider the ingenious recuperation of the image of *tapia valenciana* in the Alquería de Pinohermoso, in the town of Burjassot. The building, one of the medieval farmhouses in the Valencian countryside, had suffered a progressive decline throughout the 20th century, and had ended up in a state of ruin. Besides the loss of floor and roof, in recent decades the walls of the main façade had collapsed. Recently acquired by a new owner, its rehabilitation was undertaken to be used as a second residence. In this case, the walls were rebuilt with new material and then “transformed” into *tapia valenciana* with a layer of mortar and bricks -or fragments of brick- embedded afterwards. It would have been preferable to build the wall in the traditional way, but even so, the recovery of the farm, a landmark that was destined to disappear, must be celebrated.

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