We have received many different messages concerning our editorial stance and other aspects of the magazine, cultural referents; these are the people who make us feel LOGGIA has undoubtedly followed an editorial line praise about LOGGIA or considered the articles in it cultural events or written texts, have spoken words of from the start, but this has more to do with research and restoration methodology, reflected in the content of the is due to no merit of our own but of all those who have In LOGGIA we have striven to include the most significant samples of international theoretical thinking, so far regarding our country and Italy. We intend to expand this theoretical panorama by including in future issues the ideas of some of the most prestigious British and French restoration architects.Everybody knows the longstanding Italian tradition of theoretical reflection, the different schools, research centres and trends and, in a word, the influence of Italian architecture in our country. For these reasons we have included the different ways of thinking of some of the leading Italian restorers of today. Anyone who has followed these articles will see that we have included opposing approaches, although all of them are based on a structured theoretical discourse but from different lines of thought. This fact should not discourage anyone. A single theory or only one line of thought is out of the question today. In our opinion LOGGIA must not give voice to any one line of intervention, although those of us who bring out the magazine or collaborate more often in it have our own points of view, which we undoubtedly express as individuals, but that does not mean that we do not follow any predetermined line beyond what I have explained. Each person is responsible for his own way of thinking and architectural workmanship. For these reasons the works included cover a broad range of possibilities in order to present at least part of the most important trends in the current panorama. No one who faces up to the difficult, complex task of intervening on a historic building with the rigour to be expected in this type of project must feel excluded from LOGGIA. This editorial should help convince many to send us their projects and reflections. We would also like to encourage our readers to respond to the theoretical articles, to express their opinions about the works published with the healthy intention of establishing up theoretical and conceptual aspects. We also hope to continue receiving news about doctoral dissertations, books published and cultural events related to heritage buildings. From the editorial line that characterizes the magazine, we wish to insist even more on the technical aspects necessary in the complex world of conservation and restoration at the service of theoretical thinking. We also wish to touch on the restoration of modern architecture. In past issues we have published outstanding examples of this; in future issues, according as it is possible, we shall include the restoration of some paradigmatic examples of 20th century architecture. The protection and therefore the restoration of modern architecture is attracting more and more attention as the years go by, and now constitutes a privileged source of research. At claiming autonomy in the issue of restoration or preservation or the outright restoration of the historic building, for example. This relationship between preservation or the outright restoration of the historic monument, in expounding on it and in coherence as regards criteria. Nevertheless, I realize that a rigorous methodological process alone does not guarantee a brilliant result or that different authors will perform similar interventions, because the same process will be interpreted and moulded according to the conceptual interests and criteria of those whose aim is the greater preservation or the outright restoration of the historic building, for example. This relationship between methodology and intervention becomes a subject for reflection that would be worth debating in depth. In LOGGIA we have striven to include the most significant samples of international theoretical thinking, so far regarding our country and Italy. We intend to expand this theoretical panorama by including in future issues the ideas of some of the most prestigious British and French restoration architects. 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Intervention on heritage buildings had started to be the centre of attention for politicians and the media, who had brought it into fashion, and had even used it as a platform from which - at a moment of time, considered better than the current one. It is typical of the restorer to think that, whatever parameter is referred to, it is possible to save the phenomena of "decay" with the help of restoration techniques, whether it be the inevitable effects of the
passage of time or interventions of functional readjustment that seem incongruent or unfinished works interrupted by historic vicissitudes. The history of restoration coincides with that of the selective criteria adopted to bring architecture back to a "valuation", a perfection claiming to possess the truth, always taking for granted the presence of scientifically controllable criteria. It is easy to make a brief list: formal completion as an expression of the original message, its eloquence, its capacity to assume a testimonial meaning through the updating of the values chosen in different ways; architectonic coherence; its quality as a document to identify the evolutionary trajectory of the form or of the building techniques; ratification of formal or typological models, etc.

In spite of the many years of debate, the world of preservation is less well known, due also to a certain amount of ambiguity of the term, which is only used in opposition to the term "restoration", and considered superior to it: preservation corresponds to a thesis that could be summarized under the following principles, with the limitations of this word as we shall see at the end of this list:

- Total renunciation of historicism, of the idea of a rational historic process, univocally progressive, recognizable in its integrity.
- Acceptance of historic relativism and as a result of the lack of consistency of hierarchies with values that can be definitively determined by the results of historiographic research: what seems to lack value in a descriptive reconstruction correlative in facts and events can be essential in another; the testimonial capacity is indeterminable.
- The number of trajectories of historiographic reconstruction that can be defined is just as impossible to determine as is the type of knowledge whose horizons are under constant expansion; therefore, any hierarchy of values and the assertion that it is opportune to safeguard everything of historic importance is also arbitrary.
- An aesthetic judgement, subjective by definition, cannot offer objective valuation instruments and as a result constitute a "foolproof" token of effectiveness.
- All historic events are unique and therefore unrepeatable.

- Nothing is the same as itself, continual mutation is a condition of our existence and that of the things around us; change is the only certainty in our existence, at least as regards our experience.
- Architecture, a maternal and representative witness of cultural effects, the structures that form an essential part of our awareness of the world, our place of existence, lives in time and is materialized in its modifications, just like any other vital happening: therefore it is unrepeatable and impossible to bring back to its origins; it is not re-constructible after it has disappeared.

- Our past, which gives no certainties or laws to determine the future, defines the conditions of our possibilities to act, limits them, but also offers the opportunity of a project that will not spoil the value of what has been brought about by time.

- Joining the awareness of the past with its projection into the future surpasses the antithesis between being and becoming, in the same way as the awareness of the impossibility of separating contemplation and use in architecture eliminates the antithesis between consumption and permanence, and therefore, the presence, as eternal presence barely perceived by our consciousness and as maintenance of its experience, presupposes consumption.

Preservation, then, cannot mean anything other than searching for a set of rules of transformation that, given the unanswerable nature of memory and its multiple documentary character, emphasizes permanence, adds its own stamp and reinterpretations without destroying. It is obvious that the preservation proposal seen in this light, although it does not intend to establish principles based on history, neither does it impose itself as an absolute principle but as a proposal, an objective to aim at in the effective conditions in which the act of preservation is implemented, defining itself in the reality of the possible operations that shape it. It is just as important to remember that preservation constitutes an objective that is directly opposed to the course of existence, and this cannot be an excuse to ignore the progressive shift in living necessities, the multiple level of installations and consideration of the services that the surroundings offer people. With this, the selective parameters that define the "state of necessity" that justifies the loss of the pre-existence change because of their very nature: in principle it is not a case of criticism but an out of issues of a moral nature that will certainly not consider the material and functional requirements secondary to others.

It should be noticed that preservation culture seen in this way does not contradict, in its protagonists' premises and practice, the modernity that is undoubtedly an essential part of it, since it tends to reconstitute, refurbishing or remaking in style. On the other hand, in cases in which the return to the old historian philology applied to the city, an interpreting ideology has been used, we may say, through typology, the construction in style culture like by cultural relativizing and a total rejection of modernity has taken place. It would be easy to establish parallels between preservation theories, modernity and the philosophies that have led to the surpassing of absolute historicism, but there is a limit in the architectonic issues, or rather, in the expectations and the timing of their protagonists. I am referring to a consideration of the past that tried to ensure the presence, the message, as if it were totally expressed in monuments (declared as such, by irony of destiny, by that historiographic culture that justified preservationism) understood comprehensively as representative, thereby denying them the value of existence. On the one hand, there was an acceptance of a state of inferiority of the new ideas about architecture which were denied the possibility to generate an autonomous interpretation of history; on the other hand, an analogy was created with the position that condemned the disappearing modernity by affirming the rapid change of architecture subject to the change of functions that univocally determined its form. Modern architecture, like the previous one, is condemned by affirming the disappearing modernity by affirming the rapid change of architecture subject to the change of functions that univocally determined its form.

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The preservation project is, then, projectual, it contemplates the totality of what exists without making itself totalizing for that reason; it faces up to the present and inevitably to modernity, it cannot partially contemplate the consideration of material reality, it does not separate use from contemplation, and thus it cannot become impregnated by an economic aspect, in the broadest sense of the term. The limits of preservation are situated on another level: the impossibility of preserving, if it is truly so, is not subjected to any type of moral judgement, which contemplates at the most, although only in some cases, the actions that have led to an irreversible degradation; the destruction or alteration through causes of vital order are the inevitable result of a judgement of values that can have ample margins of opinion.

In certain cases there will be no doubt, for example as regards hygienic, environmental or safety requirements of a relatively urgent nature, also because these parameters do not permit objectivity but must face up to statistical valuations and the inevitable existence of a certain amount of risk. In most cases the judgement can only be formed through the confrontation of data and the observation that derives from the sense of the term. The limits of preservation are situated on another level: the impossibility of preserving, if it is truly so, is not subjected to any type of moral judgement, which contemplates at the most, although only in some cases, the actions that have led to an irreversible degradation; the destruction or alteration through causes of vital order are the inevitable result of a judgement of values that can have ample margins of opinion.

Familiarity with the past, the appreciation of historic monuments, has disappeared, considering culture to be all forms of humanized nature; culture contributes to reaching that objective, realizing a person and developing his ethical values in itself; and the rest of the inevitable options of a private nature that come up during an intervention must arise from the confrontation of diverse ethically desirable objectives, although they may be incompatible with each other. Presumably, and we can take for granted the bases on which it is founded, that restoration, preservation, in any case any important activity on the testimonies of the past involves the recognition of the cultural value of experience, of the possibility of relationships, of the need for memory. The object is not preserved as a value in itself, but as a value for mankind, a testimony of thinking about culture and the human being, a practical solution to a wholly practical circumstance; as a source of thought, susceptible to a use that at a material level adds reflection level to the role carried out by the object in the past, and its current significance according to the function in the past. Economic considerations can have a dimension we might define as mere accountancy, costs and profits, or at a more complex level taking into account the more difficult to quantify moral and psychological benefits, such as environmental quality, bonds of affection established with the places of the past, and inevitably to modernity, it cannot partially contemplate the consideration of material reality, it does not separate use from contemplation, and thus it cannot become impregnated by an economic aspect, in the broadest sense of the term. The limits of preservation are situated on another level: the impossibility of preserving, if it is truly so, is not subjected to any type of moral judgement, which contemplates at the most, although only in some cases, the actions that have led to an irreversible degradation; the destruction or alteration through causes of vital order are the inevitable result of a judgement of values that can have ample margins of opinion.

LOGGIA N°9

The cinema in Barcelona

Sala Mercè was not the first play-house in Barcelona established for the public projection of cinematographic products. In the year 1904 alone, seven or eight of them were inaugurated in the city. According to Miquel Porter, "the first presentation of moving pictures in Barcelona was carried out by means of the 'electrotakiscope', which was used from 1982 to 1894 at the Panorama Imperial". In 1895, at Salón Edison in the Plaza de Cataluña, Edison and Dickson's 'kinetoscope' was presented and Lumière's cinematógrafo, again according to Porter, was not presented until 1896 at the studio of the Napoléon photographers. And it was not until the start of the century that the Bellers (artists from Aragón who had settled in Granollers) opened what could be considered the first commercial cinema in Barcelona, which was burnt down in 1904, the same year Sala Mercè was opened.

The inaugural ceremony was named after the patron of the city, Our Lady of Mercy, was initially scheduled for Saturday 29th October, but at the last minute the ceremony was put off until the following Thursday at five o'clock in the afternoon, with the attendance of the "most distinguished families in the city." It was promoted by the painter Lluís Graner Arrufi (1863-1929), who had become an impresario, and who was to create shortly afterwards the "Espectacúllos y Audiciones Graner" (Graner Shows and Auditions), a great artistic success between 1905 and 1907, which eventually reduced him to poverty.

At Sala Mercè, Graner intended, in the words of Joan M. Minguet, "to combine different artistic languages, both the old and the very latest, such as, for example, the cinematógrafo, which was, according to this scholar, "a most unusual initiative in the cultural and artistic scenario of the Catalonia of the time". So the documentary-type silent films and the "talking movies" ("always full of good humour," according to a witness of the time, and often musically illustrated with actual concerts) were complemented with a final show which, this witness says, "displayed an exquisite lyrical sense and reproduced the story of some popular song or a historic deed written especially by the best poets and musicians".

In spite of the popularity of the Sala among the local intelligentsia, the fact is that its programmes, as we can gather from the chronicle of the above-mentioned inauguration, always had a very precise character. A painting by Graner and a film by Disney had a great deal in common," says Joan Munsú, for whom Sala Mercè "had a strong flavour of kindergarden cum sanctimonious, by definition the great temple of the sanctimonious type of spectator that people (especially those Catalans) sought as family entertainment". Sala Mercè, which in the opinion of Joaquim Renart was "a refuge for peasants and strangers, who went there to split their sides laughing," for the always outspoken Joan de Seguró, "was one of the most deadly boring and disagreeable sights that came out of Modernism", although he himself admitted that, "poor fool that I am, I actually enjoyed myself to kill there".

Perhaps the historic transcendence of Sala Mercè resides, then, rather than in Grainer's artistic aspiration, in a factor that was emphasized by reportes and writers back in 1904: the fact that it had been designed by the "renowned architect Mr Gaudí," who was at that time occupied in making or preparing his more universally known works, apart from directing the building of the Holy Family, and who that same year had made Lluís Graner a project (or some drawings) for a house, of which only the foundations and the gateway were actually built.

Description of Sala Mercè

The architectural features of this work by Gaudí have only been known until the present day through descriptions made by witnesses of the time which Gaudí scholars have reproduced more or less textually. The discovery of some photographs of the play-house, published in La Esquella de la Torratxa on 11th November 1904, which, like all caricature, must be analysed with caution. From this drawing we can deduce that between the two doors mentioned by Baldelló there was a curved, perhaps semicircular stone pillar crowned with a capital similar to others to be found in Gaudí's repertoire, with a beautiful cornice worked out of iron, probably wrought and riveted, and covered by a little roof that might have been made of glass, from which there hung a sign bearing the name of the local and underworld, surrounded by chains, the emblem of Our Lady of Mercy. (We must not reject the possibility that this crest was lit from inside, since the reporter from the newspaper El Liberal, who described...
The ventilation and illumination of the locale were other universally applauded virtues. "The premises, thanks to Gaudí's good design, is ventilated in such a way that the air circulates and is renewed without one's noticing it, and it never becomes stuffy," stated the magazine Cu- cut, an affirmation that was undoubtedly true, and then went on to say, in a tone more in keeping with its condition of satirical publication, that "unlike other play- houses where so many examples of perversion can be witnessed, at Sala Merè not even the air is polluted". It was very likely that the little round holes opened at the back of the play-house had something to do with this ventilation system, an aspect in construction about which Gaudí always seemed to know a great deal, apart from the brilliant intuition he had in that respect. (Nevertheless, the photographs show a series of primitive electric fans on stands, never mentioned in the reports of the time, whose transcendence in the airing of the premises is unknown to this writer.)

As regards the electric lighting, Balleldó explains that "it was hidden so as not to disturb you when you went in and the bulbs were wrapped in coloured tulle," although other witnesses mention coloured paper to dim the effect of the light. According to the priest and organ-player, the simple decoration of the half-circle to the right of the stage, with the light fitting for the choir shows presented there, which took place mostly in the dark, seemed to be reminiscent of the atmosphere of a "cave". (Gaudí's cave-like intention in many works is well-known, and this tendency of the architect's has given rise to the "gothic" and "visionary" speculations as to his innermost thoughts that could supposedly only be interpreted by members of the Freudian school.) Whether or not this intention was present (in the case of Sala Merè it is more logical to suppose it was a condition of the job), the upper part of the back wall of the room, the one hiding the projection booth, is resolved in such a way that it looks like natural rock. A crest of the Virgin of Mercy, very similar but not quite the same as the one reproduced in La Esquella de la Torratxa, was situated on this wall just underneath the projection openings.

There is absolutely no doubt that in the basement of the premises (although we cannot determine exactly in what part of it) Gruner set up some "artificial grottoes" which were seemingly designed by Gaudí also. Here they presented "surprises and practical jokes to amuse the public" (some say devils appeared and talked to the visitors and false ticket sellers to mislead them), with "dioramas, a cascade of real water, an artistic manger, life-sized sculptures and fantastic effects with coloured electric lights" and "structures made of iron and cement". (In the construction of the grottoes, according to La Veu de Catalunya, only these materials were used, "as it is the case also in nearly all the rooms of the premises, which is a definite guarantee for all those who go to visit it." "

Sala Merè within Gaudí's oeuvre

Joan Maria Minguet, in his documented text about Sala Merè, regretted that he has no plans or photographs to go on, says that "it would be frankly suggestive, or even revealing, to know in detail Gaudí's conception of what a theatre should be. Especially a theatre where different types of artistic language had to be amalgamated". I do not know if the photographs that have now appeared are sufficient to satisfy this legitimate concern. In any case, it is worth appraising this minor work in the whole of the master's production, although it does have the essential features of his architecture. (I do not include here, naturally, purely stylistic aspects or others, such as the obsession with caves, for example, but the efficacy and beauty with which his works respond to the function that justifies them and the rationality in the use of materials and constructive systems.) Sala Merè has these essential features. The solutions to guarantee visibility, good hearing, perfect ventilation or safety (solutions that by no means common at the time, to judge from the amazement and admiration they provoked) are a token of this. And regarding the formal aspects of Sala Merè, they are on a par with Gaudí's other works. The simplicity of the ornamentation (free from the decorative rhetoric that this type of commission could have given rise to); or the elegance of the illumination (based on light and not lamps!) help make that play-house a little masterpiece. It could not have been otherwise.

Gaudí started at the Sagrada Família Church as an architect with the commission of continuing the construction of the Neo-Gothic temple of his predecessor Francisco de P. Villar. A few years later, an exceptional donation permitted him to carry out his project. "Everything about the Sagrada Familia is providential, including the fact that I was called in as the architect, but above all the large donation received at the beginning, which made it possible to give the church more momentum and accelerate the facade that is now almost finished... I admit that this shows an optimistic vision of things, but no important work can be done without optimism.

These words were spoken by Gaudí in the presence of the young architect César Martinell, who took them down. Gaudí, although he had to respect what had already been done, imagined a quite unique temple—Neo-Gothic, of course—of which he enlarged the ground plan and increased the height. Five years following the longitudinal axis and three in the transalt. Eighteen spires in a vertical composition that raises over the crossing a dome crowned with a very high cross, symbolizing Jesus Christ, flanked by four others dedicated to the Evangelists and above the apse, a crown of stars evoking the Virgin Mary. Three facades with four bell towers in each one, dedicated to the twelve Apostles, complete the ensemble. This general scheme will be maintained, although the Neo-Gothic aspect and the structure would become something quite new later. Gaudí had given a great deal of thought to what a great Christian church should be. He said that it was the best commission an architect could be given and he dedicated all his lifetime to it. He often remarked that all his other works permitted him to enrich his experience so that he could better express his ideas in the Sagrada Familia. He wanted to overcome the problems that he thought affected the Gothic architecture he so admired, but said he "needed crutches" to solve the thrust of the vaults. He wanted to achieve a synthesis between structure and form such as he observed existed in nature. The Count of Güell would help him in his task, by commissioning him to build the Chapel for his industrial Colonia Güell at the end of the century. In this building, Gaudí was able to study and experiment thoroughly with his new ideas. Tilted columns; the use of ruled surfaces in Catalan vaults; solutions that integrate colour with the use of duly selected materials. A funicular structure in space with which he could try out a new system of calculi with an inverted model in 1:10 scale, in which some little bags filled with birdshot proportionally to the thrust of each element are connected in a complex reticulum of strings and wires. "It is necessary to divide the inert masses and therefore multiply the number of active elements; this is what I have done in the Sagrada Familia Church." (Big.CGB. 174). Later, after he had discovered the possibilities of the hyperboloids, he started the third and definitive solution for the church. He used all ruled surfaces: helicoids in the columns, planes, conoids, hyperbolic paraboloids and revolution hyperboloids in the vaults, windows, roofs, doers, etc. Gaudí said: "The helicoid represents..."
movement, the paraboloid is the father of geometry, the hyperboloid is light and the tetrahedron is the synthesis of space." (MGSF, 125)

The ruled forms, resistant, continual, with double curvature, opened up numerous compositional possibilities to him and he used them wholeheartedly. The new, original architecture that he visualized could be like nature, because nature does not exist.

"Originality consists of going back to the origin; so anyone who goes back to the simplicity of early solutions with his means is original." (B.g.C.B. 25)

"Without the large scale trial of twisted forms, helicoids in the columns and paraboloids in the vaults and vaults, that I built at the Colonia Güell, I would never have dared to use them in the Sagrada Familia Church, as I have said before. This work was, then, the preliminary experiment of the new architecture." (Hg. HO, 102)

Gaudí was aware that the building of the church he dreamed of was such an important work that only the continuity of generations and the effort and will of a whole people could see it through. That is why he had to establish his absolutely new ideas so that those coming after him would be able to carry on and finish what he could not, because discontinuity does as closely as possible to his project. Geometry would be the way to define each element accurately. The plaster models in 1:10 scale made it possible to appreciate the real volume of what would otherwise be very difficult for any brain but his own to render in space.

These ideas were clearly defined and realized at the tops of the bell towers. In Saint Barnaby’s—the only one he saw totally finished and free of scaffolding—and the other three very advanced towers, he used reinforced concrete. These very probably were the only buildings more than 100 m high in Europe at this technology.

The geometry and colour with the symbolism demonstrated the reality of his powerful creativity. The models of the naves, the sacristies and the structural studies and drawings and other surveys and details partly disappeared in the fire that broke out in his studio and workshop in 1936 in the revolution and civil war.

Fortunately what was saved, carefully conserved and restored—the original plaster scale models—is a valuable and more and more valued token of his creative force. But if these models had not been thoroughly studied, it would not have been possible to find part of Gaudí’s great contribution to world architecture. Gaudí was a great observer of nature. He saw that in natural forms there is no discontinuity. "That tree standing beside my workshop..." (OO, 123)

Gaudí said. From his observation he had come to the conclusion that forms with double curvature generated by straight lines—which is why they are also called ruled surfaces—are enormously resistant.

So the tree-shaped structure that he designed for the Sagrada Familia Church permitted him to divide the efforts to support the weight of the vaults and roofs and transmit them to some columns, achieving the synthesis between structure and form. If on top of that he joined it with geometric modulation, the language whose use would permit his successors to continue and develop the project he dreamed of was easy to obtain. Thus he achieved a reticular structure in space, with forms generated by straight lines geometrically ordered by a simple modulation. This modulation is based on series that are repeated and which the multiples and divisors of 12 are always present. This was unheard of until then.

When I accepted the work as architect of the Sagrada Familia for the construction of the naves, I decided to carry out an in-depth study of the original 1:10 and 1:25 scale models: possibilities to the first permitted the ten-fold increase of the measurements of each element. This was a reasonable and easy solution. But the second, knowing the generation of Gaudí’s column, why not investigate every element more profoundly? This was the way I chose.

Gaudí’s column is the result of the intersection in space of two helicoids that, starting from a polygon, by rising up and twisting right and left at the same time, give rise to edges that multiply until they become a circumference. Gaudí wanted to obtain at the same time the resistance capacity of a Doric column and also the movement—a sign of life—of a Salomonic column. In search of that new solution, he experimented with different kinds of columns in the Güell Park and Güell Colonia Chapel. Finally, after two years’ efforts, time and money, he obtained the desired result. A totally geometric solution that he later applied to all sorts of polygons. But how? The helicoidal twists are produced at certain heights and angles that are as follows in the case of octagonal columns:

- The height of H and the sides of the polygon n, the circumference is reached at a height: $H = n \times \pi / 2 + \pi / 4,\ + \pi / 8,\ + \pi / 16,\ + \pi / 32,\ etc. = 2n$.

In the case of an octagon:

$H = 8 + 8/2,\ + 8/4,\ + 8/8,\ + 8/16,\ + 8/32,\ etc. = 2 \times 8 = 16$

The twists are produced at: $22^°30' + 11^°15' + 5^°37' + 2^°49' + 1^°24'30", \ etc. = 45°$

These twists create edges that multiply from 8 to 16, 32, 128, and more and more valued token of his creative force. The plaster models in 1:10 and 1:25 scale made it possible to appreciate the real volume of what would otherwise be very difficult for any brain but his own to render in space.

The ruled forms, resistant, continual, with double curvature, generated by straight lines geometrically ordered by a simple modulation that is linked to the geometric forms created by connecting straight lines—hyperboloids, paraboloids and helicoids—show us the titan-like effort Gaudí made to resolve this new architecture with the few means he had at his disposal.

With today’s technology we have computer exactness to permit us find easily many solutions according to the geometric idea we prefer. Just a hundredth of a degree in the angle of the asymptote of a hyperboloid can modify the result of the stars made by the intersections of these surfaces. Following the proportions and the modulation, based on the exact measurements of the circumference of the annulets of the hyperboloids, it is not necessary to measure the original plaster model in search of a possible approximation. The intersections of each surface can be accurately determined by trial and error. This is how the sacrifices were designed, of which there are some excellent very approximate drawings made by the architect Puig Boada, based on the restored original plaster model. The structural calculations are now

architect Domeneç Sugranyes, Gaudí’s immediate successor as director of the building of the Sagrada Familia, some manuscripts were found that confirmed what would otherwise have been no more than a hypothesis.

After Gaudí’s studio had been burnt down, Sugranyes thought that there was nothing left. All the papers certainly were burnt, but some pages of the plaster models had survived in very bad condition, a fact that he probably was not aware of. Posterior restoration was possible. However, shortly before his death in 1938, Sugranyes wanted to write what he considered "an indispensable duty", to explain how the architectural solutions with his means is original." (Bg.CGB. 25)
complete, and they are ready to be built as Gaudí had planned, in order to take advantage of the experience for the construction of the central dome. The lateral aisles and the hyperboloids of the central aisle have been built with the Catalan vaults that Gaudí indicated following the generatrices and filling in with Venetian mosaic the triangles resulting from the divergence of the rectangular shape of the bricks. This gives the palm leaves, symbol of victory, that are to decorate the central aisle. The result, although partial, is a sample of my interpretation, which I dare say is very similar to what Gaudí himself would have done. A structural and formal study of the crossing and apse is being carried out. The columns continue the treelike design proposed; they overlap another; the transfer figures are reproduced; the tilting of these columns corresponds to the structural scheme and their diameters follow the same single and repeated proportions as always: a unit, a half, two thirds in the ground plan and elevation, both in the transversal or longitudinal section. Gaudí had faith in his successors. He said: "No one must bewail the fact that I cannot complete the church: I shall get old and others must come to take my place; in this way, the work will be prolonged by magnificence." (MGSF, 102/4) And he added: "The spirit of the monument must always be maintained, but its life must depend on the communications that transmit it and with which it lives and becomes incarnate". (C. Prop. March 1902) "I know that my personal taste of the architects who succeed me will influence the work, but I am not concerned about that, I think it may even be good for the structure." (M. GSF 43).

Gaudí left the ramification perfectly well resolved. The shift from one to two columns starting from a star the two symmetrical branches generated by each circle, the bottom linking the two upper circles with the annulets generated by a square, starting from the rectangle that served as basis of these originals and following the same divergences that he probably saw in his privileged mind's eye, but which the accident that took his life did not permit us to express. The use of the computer makes it possible to visualize Gaudí's studio in virtual reality and see with greater quality the architectural ensemble where Gaudí and his collaborators lived as though it were their Nauithals and where they created a large number of forms for the present and the future of the Sagrada Familia. Although part of the constructions of the ensemble made up of Gaudí's studio and dwelling in the Sagrada Familia on the corner of Saradnya street and Provença street are still standing, albeit with several posterior repairs, the fact is that the buildings the architect made there to meet the needs of his work can no longer be said to exist. Therefore the virtual reconstruction made is based on the photographic documentation available, on the parts of the buildings still standing, on plans drawn up afterwards by his successors, on descriptions by chroniclers and in written testimony of what they saw and on the knowledge we have of Gaudí and his way of thinking and building. It seems necessary to mention these points at the start not only to give an idea of the work method followed, based on a deductive process and a painstaking study of proportional relationships, but to pinpoint the aims and aspirations of this ideal reconstruction.

Above all, the intention of this work is to carry out an approximation exercise to Gaudí's formal universe and specifically the most intimate atmosphere of his workshop and living space within the Sagrada Familia. Of course, in making this model, we strove to achieve geometric and constructive coherence and the rigour and precise adjustment between the different elements: walls, vaults, roofs, carpentry, banisters, etc. The process of adjusting all the construction spaces and elements was a long one, in which new information was verified until a definite idea of the space was achieved. The measurements were based on the plan made by his successors and exhibited at the Sagrada Familia, which contained a certain vagueness that needed to be measured against the constructions still standing and compared with the plaster models to give us a fairly exact idea of the ground plan of all the buildings. On the dimensions of the ground plan and the relation of the dimensions obtained from the photographs with their perspectives, it was possible to adjust the vertical measurements of the whole ensemble, based also on the vertical measurements of the constructions that were still standing. Although there are still a few elements that may not be perfectly well adjusted, they are of a secondary order and we can affirm that the adaptation of the ensemble to its previous dimensional reality is practically exact. All this process went on for a year, although not without interruptions, corroborating the results with the successive data obtained, and this effort could later be diluted in the general vision of the forms of Gaudí's space that we did not want to express. The model made does not contain more information than what can be deduced or interpreted from a painstaking examination of the photographs and data available; however, the integration of all this information in a single three-dimensional model permits the virtual re-creation of the work and a chance to see it from different angles and to learn more about it and Gaudí's work in general. This is, then, the main aim of the reconstruction performed. Once the objectives have been set in these terms, there are different reasons to decide on the construction of a computer-aided model as the one we have created, that is opposed to the alternative possibility of building a model. It is obvious that the possibilities to test, rectify and adjust in a process of deduction and trial and error like in this case are much greater when working with a computer-aided system. However, it was not only these obvious advantages in the process of creating the model that recommended resorting to a virtual model but, above all, the very much greater opportunities it offered for visual and perceptive exploration. Whereas a real, physical model, unless it is made in scale 1:1 or large enough to make realistic photographs, always places the spectator outside the scene or space represented, a computer model allows the observer to go in and look around. This was precisely one of the principal requisites in this case because, rather than a geometric study, what we wanted was to be able to breathe the atmosphere of the work under study. We must point out, lastly, that in no case did we intend to make a virtual construction of a kind of stage scenery or film set for a period film. In other words, in the production of the virtual images included we avoided all sorts of surface treatments (textures, colours and qualities of the material); and the truth is that the attitude with which we made this approximation to Gaudí's workshop in the Sagrada Familia is not an archaeologist's attitude of trying to recuperate a lost universe but an attempt to perform an exercise of visual poetic reading, with the eyes and resources of the end of the 20th century, of a work that, in spite of its modesty and ephemeral, utilitarian nature and in spite of the time it was built, appears absolutely up-to-date in the virtual images obtained with a computer-aided model which, we repeat, does not invent anything but strictly adheres to the historic data available. In the same way as the reader of a book re-creates in his mind's eye the scenes and settings of the narrative by following the author's description of them and filtering and completing it from his own personal viewpoint, the virtual images of Gaudí's lost ombador respond to a re-creation that, while keeping strictly to the different visual or written narratives that describe it, is tinged with an abstract, oneiric, personal vision. What we have in mind are the keys necessary to view these images.

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Gaudí's studio-workshop

Antoni Gaudí's studio was located at the corner of Cerdanella street and Provenza street, near the Sagrada Família. It was an organic reconstruction that had been made at the different phases according as it was needed, so it showed the stamp of the different stages at which it had been built. The first part to be built was the chancery house in the Sagrada Família, completed around 1887. As Antoni Gaudí started the Sagrada Família works in 1883, we can presume that he was also responsible for the construction of this secondary building.

The fact that this building was anterior to the first construction of the Sagrada Família crypt is revealed by contemplating photograph 14. This building had a gable roof with projecting ends over a flat vault. The wooden-shuttered windows were sloping like those of the Güell Estate house. At the end of the last century, works were initiated on the upper floor to make a studio for Gaudí.

At the beginning of this century, the photography workshop and the adjacent model store were added in the corresponding corner.

In the photography workshop and the storeroom for the models in the nave of the church, there was a sort of a workshop with a door narrower than the size of the objects to be brought in, with shutters that could be closed to let natural light in gradually (photograph 15). The central part, higher and with a calotte roof, was large enough to hold the model of the central nave of the Sagrada Família Church. To provide the two facades, both the external and the internal, model store, and other functional elements, the windows were installed with curtains inside to protect them from the light according to the work being done and the time of day.

Beside the photography workshop and model place, there was a model storeroom in the corner. Its conoid roof with a flat vault was to become a model later applied to the roofs of the provisional schools at the Sagrada Família. In this building, the model store, Gaudí used a conoid for the first time. Around 1906, a room of approximately 30 square metres with a cambered brick roof and the anagrams of the Sagrada Família at the top was built inside these constructions. It was used for different acts. In spite of the mutilations and destruction it underwent in 1936, this room is still in a good state of repair today (photograph 16).

The building was surrounded by a garden with trees: eucalyptus, palm trees and other deciduous species that, together with other secondary constructions (arbours, fences), made up Gaudí's work place, where he carried out his work and was visited by his architect friends during the last years of his life spent at the Sagrada Família.

César Martínell tells us about this in his book Gaudi (p. 105). "He used to be in his studio at the church. A pavilion destroyed during the war 1936-39, in the same place as the current one, built with double walls without plaster on the outside, decorated with projecting headers. You got to the upper floor, where his studio was, by a comfortable wooden staircase leading to a spacious room with large compartments, a pleasant appearance and simple furniture, made of unpainted wood. A glass door gave on to another large room with an irregular shape. At one end of this room, a sort of storeroom, there were moulded plaster figures, personages dressed in sackcloth or other cloths, models for the sculptures he himself created. The outer walls were largely made of glass and the light was filtered by climbing plants growing on the outside. The whole ensemble, in spite of its traditional elements, had a spatial concept that has not been surpassed by the architecture of today. At one place the roof could be moved by means of counterweights, like the double leaves of a huge door, opened wide on winter days to flood the room with light. Further back, there was a little room that I very seldom entered, filled with rolls of paper, models and plans, among which stood the modest bed, where he spent the night when the bad weather or other circumstances prevented him from going back to Güell Park when he lived there."

Gaudí’s studio, as we have already explained, was installed on the top floor of the chancery’s house. The photographs published by La Gaseta de les Arts on the occasion of Antoni Gaudí’s death permit us to describe this studio at that period.

Side view of the studio (photograph 17)

Gaudí’s studio with the drawings of the Facade of the Passion. Top left: photographs of the Venetian mosaics brought to him by his friend and collaborator Lluís Bonet to complete the decoration of the pinnacles on the Sagrada Família towers. Centre: photograph of the drawing of the Sagrada Família presented at the Grand Palais in Paris in 1910, at an exhibition about all of Gaudí’s work. Metal objects, lanterns or votive lamps that Gaudí used as a remedy for the arthritis he suffered in his hands.

Interior of the studio (photographs 18 & 19)

The photograph 8 shows the table that Gaudí used for his meals at the studio. One of the comments in the publication where it appeared makes a reference to the breakfast bag hanging from the oil lamp. According to the article, it contained the artist’s fragil dinner consisting of slices of bread and honey and a handful of raisins.

The photograph 9 shows the room where the drawing boards and plan archives were kept, and where Gaudí had a false ceiling put in for the plaster models of the animals that were later to be sculpted in stone to adorn the apse pinnacles and gargoylees of the church, thus achieving good isolation and a phantasmagoric appearance. Two hanging gas lamps light the room and a xubesi stove heated it in the winter. On the right hangs a painting sent to him from Chile by a Franciscan, who asked Gaudí to design the church of the Virgin of Rancagua. In the background to the right hung two models of the mouldings of the Rosary door in the Sagrada Família cloister. On the board on the right, there is a 1:25 scale model of the central part of the Sagrada Família church with overlapping hyperboloid capitals. Some elements can be seen in both photographs, such as two plaster hexagons in the ceiling, models for the ceiling of the Café Torino, in which Gaudí collaborated.

Gaudí’s bedroom (photograph 20)

His bedroom, which he only used when he was unable to return to his usual home in the Güell Park and where he slept for the last six months of his life. At the end of the room there is a window with a balcony at an angle giving on to a garden-like terrace at the centre; this gives the room good illumination and ventilation in keeping with his standards of hygiene. The caption of the photograph in La Gaseta de les Arts said:

"Gaudí’s bed-sitting room. In the privacy of his workshop, among wooden partitions, the most humble bed which he folded away to perform mental tasks, which he often did personally. Beside it, a work bench and a fragment of a model of one of the bell towers, which he worked on during his long sleepless nights."

The photography studio

The photography studio and room for the 1:10 scale models of the church nave, designed between 1913 and 1915, was published in Pro (photographs 13 & 14). In those years, Gaudí was working on paraboloids at Colonia Güell and saw the results of the forms. The columns in the church have a helicoidal turn in only one direction. The photograph allows us to determine the interior of this space and the study of the first solution of the naves. In the background of the photography studio, a skylight was later added, permitting him to place the 1:10 scale model of the central nave lit from above.

The studio with the model published (H.de O. 17th March 1923) corresponds to the solution between 1918 and 1922 (Photograph 15). The first windows on the left are the final ones, with hyperboloids from the interior facade. The columns of the choir, in the centre of the photograph correspond to the solution with paraboloids that Gaudí worked on between 1915 to 1918 and the columns on the right of the central nave are close to the ramified solution with a double turn of the definitive solution. The linking capitals can be disassembled in order to decide on the most suitable solution. The photographs published in 1923 in the Anuario de la A.A.A.C. show the models Gaudí had made between 1920-1922, and belong to the 1:10 scale model of the column of the central nave of the Sagrada Família.

This solution, although it is not yet final, resolves the upper ceiling with overlapping hyperboloids, which was to be the solution finally adopted for the main hall of the church. To emphasize the model of the column, there is cloth or paper at the top of the picture. This prevents us from seeing the rest of the photography studio and the models in it clearly. In this solution, the column is slimmer and only joined at a height of 30 m to the ceiling of the side nave, which is the definitive solution. The group of photographs 24 of the C.O.A.C. Sugranyes archives are the originals of two of the sixteen photographs published in 1923 in the Anuario de la A.A.A.C., while Gaudí was still alive, by D. Sugranyes, his assistant at the time. They show the deleted part that they did not want published in the article that explained the stability of the central nave and columns of the Sagrada Família, and also the other parts of the studio-workshop with the plaster models of the definitive 30 m naves and the earlier solutions with paraboloids.

César Martínell makes the following remarks about this room on 7th February 1915 in Gaudi i la Sagrada Família (pp. 63-64): "On a table he has a hyperbolic paraboloid made out of four strips of wood and red thread. To give a practical demonstration of its properties, it lies on an axis into the room where we are raising part of the roof, which works with counterweights. He shows us the projections of the hyperbolic paraboloid by the shadow that appears on a table flat, depending on the position, gives linear or radial lines. Gaudí thinks this surface is the synthesis of all geometry, because he says that everything comes out of the hyperbolic paraboloid. Then he points out the intersections of a plan with the revolution hyperboloid in a clever, simple way. It consists of a flat piece of wood which has a straight slot that lets the sunbeams through, and they follow a flat surface; if the hyperboloid, constructed with threads (generatrices) attached to two wire circles (directrices) is placed here, the intersections obtained according to the positions of the hyperboloid can be clearly seen."

The last photograph of the photography studio (photograph 25) and the models where the last solutions are clearly seen belong to the Sagrada Família archives and was originally published in 1929 by Puig i Boada in his book Temples de la Sagrada Família. In this photograph the layout of the models and the complete interior form of this space can be clearly seen. In the background, the separation with curtains still exists and the model storeroom with undulating conoid roofs. This photograph was taken from the corridor leading into the drawing workshop. The light is filtered
by the curtains of the side windows, probably to avoid chiaroscuro contrast. The photograph is illuminated by light from the skylight and the camera spotlight. The interior solutions of the vaults of the nave can also be seen from the first solution at the left end to the last solution in the following column. Near the bay, the last solutions of the windows can be seen. In the central part, we can see a higher column corresponding to the dome and the exterior part of the window on the façade, which cannot be seen entirely due to the size of the room. As regards this model, on 8th April 1924 César Martínell wrote in his notes on Gaudí: “They say they intend to make the Cherubim and that with them it will be as though they had made the whole project. He prefers to work at practical things than spend his time drawing a full project, which is something to be added to a record and a record is not a material work.”

Behind the columns of the wooden floor we can see the model of the new sacristy, and in the background, the tabular bells for the study for sounds. We can see the different solutions for the capitals from the first to the final designs. The photograph 26 from the Sagrada Familia Archives, which was also published by Jordi Massip with him) could have been connected to the interruption of the works is usually related to the economic crisis caused by World War I (1914-1918); but contrary to this opinion, the war is adduced by some to have favoured the Catalan textile industry, one of the sources of the fortune of the promoter of the colony and chapel. The cause may reside, rather than in the war as such and rather than in economic reasons, in the discretion of the promoter. The social situation was undoubtedly conditioned by that war, but at a local level, other no less important factors intervened. Political life was tense and revolutionary trade unions was starting to transform workers’ associations (only five years had gone by since the Tragic Week of Barcelona) and although the Colonia Güell was still outside this effervescence, Eusebio Güell may very well have thought it was not the time for excesses of any kind. The almost seventy-year-old count may have said to the chaplain and the architect that the part of the church already built, the crypt, was sufficient to perform the liturgical acts of the parish church of the colony and that it would be a good idea to conclude the work in a more simple fashion than they had intended. In this case, Gaudí’s departure (and that of the builder Agustí Massip with him) could have been connected to the promoter’s decision, and not the other way around. On the other hand, from the data available it is impossible to tell whether the decision to interrupt the building occurred overnight, although there are many reasons to believe this is so. Some toileting waiting to receive some bodies of the building, very close to the crowning of the work still directed by Gaudí, seems to indicate that at that time the architect still counted on the work continuing as he had designed it or, rather, as he had imagined it and was materializing it little by little. In view of all the above and other clues arising from analysing the current building, the only coherent hypothesis is that Gaudí suddenly stopped going to the works and that their posterior suspension, whether foreseen or not, either as a result of his departure or not, if not final, did have a sine die character. From the over eighty years that have gone by since that interruption until today, the building, however, has maintained an ambiguous image in this respect. To a visitor who is not familiar with its history, it may look finished; to those better informed, however, its provisional aspect has always been apparent, as though it had never lost hope of someone finding the funds to endow it with its authentic image.

A building to understand

The chapel at the Colonia Güell currently belongs to a consortium made up of several public institutions (among them, the Consell Comarcal del Baix Llobregat and Barcelona Provincial Council), which has commissioned the Service of Local Architectonic Heritage (SPAL) to maintain and restore the building. Before this, on the initiative of the Council, after 1987 the SPAL had promoted a series of studies to get to know and understand the building, whose behaviour raised doubts, without foreseeing any sort of intervention, as the how, when and who (and with what funds) would put it into practice had not yet been decided. The most relevant questions and answers in these studies, which brought to the fore once again the genius of the architect, have been widely spread in written texts and at public lectures, and also in university and postgraduate courses.

The static behaviour was what presented the most queries, such as, for example, what was the reason for its stability during the over eighty years that have gone by since it was built. The building as a whole was conceived by Gaudí as a replica in mausoleum of his funicular model turned 180° on the first photograph, which should only reach its final equilibrium when all the works were completed. If it was not completed, it would be unstable and this may have been the cause of the generalized cracks in the roof of the chapel. In the second place, the studies were intended to foresee how this mausoleum would react under different hypotheses of roofing and use. And finally, to verify whether the mausoleum built by Gaudí would have responded favourably if the work he had imagined had been completed.

In order to respond to all this, several studies and tests had to be performed: first, a detailed survey; second, several explorations to get to know the hidden parts about which there was no information, especially the roof of the crypt; and third, the development of a computerized numeric study to model as exactly as possible the static behaviour.

The composition of the roof was then determined, which consisted of a board with three thicknesses of bricks set with portland cement mortar and on top of it another board of two thicknesses to evacuate waters during building. It was also determined that the building constructed does not exactly show an anti-funicular behaviour (which is why it is standing) and that the causes of the cracks lay mainly in the presence of portland cement.

New analyses were performed later; among others, on the foundation and underlying land and a load-bearing test that is described in detail below. As well as all this, the studies also centred on pinpointing and evaluating the functional shortcomings of the building, which were and indeed are abundant. The deterioration of the surroundings is shocking; the exterior fabric is dirty and neglected and requires urgent attention and the interior presents use conditions which, if they are unsuitable for worship, are disgraceful for public visits (and, logically, it receives a large number of visits). Taking everything into consideration, the most important deficiency which required the most urgent measures was the roof, which was leaking badly, both in the chapel and especially in the porch.

A story to hear

Other aims of the preliminary studies for the restoration project were to find data referring to the final phase of the church building, from the time Gaudí left until the works were stopped. Gaudí’s last visit as director of the works took place on 4th October 1914. At that time, only provisional flooring had been laid in the upper nave, which also formed the ceiling of the crypt, which was finished except for the ornamentation on many elements. From the photographs of that period and later verifications in the building itself, it seems reasonable to
The new roof
The option adopted (which was not yet included in the project, as we pointed out above) did not, then, provide all the guidelines to solve certain key aspects to define the constructive configuration of that new roof: its type and its use. There were, initially, three options: a flat roof, which could be used to walk on or not, or another type of sloping roof (on condition that it would not be seen from the outside). Following the SPAL method, the decision could not take anything for granted, either of a conceptual or of a formal type. Knowledge of the building and the corresponding reflection would be able to provide us with the decisive reasons.

The explorations carried out during the first study campaign allowed us to see that in the second floor, which had been laid to evacuate water, there had been left to place the bases of the upper columns or pillars. So that if the Catalan roof hiding these were dismantled, they would presumably be visible along with the bases of the pillars of the upper nave. Initially the decision was to not leave the bases of the roof visible. But there was only one way to do so: make the new roof high enough to permit visitors to circulate below it, which would mean a new space totally foreign to the building which, however small it might be, would directly contradict the desire to have nothing new visible from the outside.

All this led us to the solution: a totally horizontal roof that could be walked on, invisible from the outside like the old flat roof, and with a new peculiarity. On it (by marking on the pavement the form and situation of the reserves left for the base of the new roof) it would be possible to see the structural scheme of the upper storey. Furthermore (this was the decisive reason), the visitor on the roof could imagine the space of the unbuilt nave by being able to recognize its perimeter on the apron of the flat roof, largely made up of the wall actually made by Gaudí although its ceiling was now the celestial vault.

The constructive response to this idea materialized in a flat roof formed by pieces through whose joints the water drains; underneath it lies the really waterproof surface that takes the water to the same evacuation points used by the asbestos cement roof at the least visible part of the perimetral wall. All that remained to be decided was how and on which elements of the building we would lean the new roof. Once again knowledge of the building was the decisive factor. Loading the roof of the crypt without increasing the load on its pillars, even though the anti-funicular hypothesis is only partially applied, increases the possibility of disequilibrium. But, furthermore, the roof of the crypt is not in any condition today to be used as a support without carrying out very thorough repairs. To avoid this, which could have spoilt the character of this fantastic ceiling, the new roof would have to be supported by another procedure. And the best one is to use some elements that undoubtedly have a more than sufficient load-bearing capacity: the pillars of the crypt, designed by Gaudí to bear the load of the whole finished building, much higher than that of the new flat roof.

Loading on these and not on the roof also means reducing the possibility of disequilibrium, as we come closer to what would have been the behaviour of the finished building.

To transmit to these pillars the loads of the new roof, taking into account the distance between them, it is necessary to place between them resistant horizontal elements like girders that therefore require a certain thickness. Making the space necessary for these girders did not involve a serious additional problem because a similar space was needed to guarantee the evacuation of water, in other words, for the waterproof sheet of the new roof to reach sufficient height on the side opposite the operands and, like the old Catalan style flat roof, the new roof could be made by using the anti-funicular hypothesis to a greater degree. This system of girders leaning only on the pillars and not on the perimetral wall apart from being hidden under the roof surface does not damage the monument and guarantees to a sufficient degree the ever sought after and usually recommendable reversibility.
Notwithstanding all this, in the initial analysis of the building a hypothesis was made about the evolutionary character of the constructive configuration of the group of basalt pillars. The four pillars could adapt to the successive load-bearing stages required during building by means of slight relative movements between shafts, capitals and bases, but which could produce a certain disorder in the elements of the fabric. The new load, although less than what the upper body would have been, could involve a change in the current state with unforeseeable although definitely slight consequences. To avoid this uncertainty absolutely, a load test was carried out on an existing set of pillars and yielded the result that the movement produced by this load on them is practically negligible. One of the last steps in the definition process of the roof was deciding the type of use it could be given, whether restricted or not. In the latter case, more than an increase of load the problem of access, safety and evacuation facility came to the fore, needs that might well have arisen that the building as a work of art could not have borne very well. The roof, then, has been made accessible for small groups, preferably in organized visits. Finally, all that remained was to determine where to place the way on to the roof.

**The portico staircase**

Gaudí designed the access to the upper nave from several points of the interior and the exterior. From the interior there were two ways up, from the chapel and the sacristy; the latter was totally completed during the works and of the former, the only thing that remained was a beautiful helicoidal floor with the upper exit blinded. There was an entrance through a side door and through the main doorway from the outside, both with their jamb fully assembled during the building works. The main entrance was reached by a staircase situated on the ramp and the platform crowning the free-standing porch of the crypt, and this staircase was never built while Gaudí was directing the works. Neither the ramp nor the platform were given any protection element. (When the crypt was blessed, a simple provisional staircase had been built on this ramp, which remained there until the building of the present modern staircase leading nowhere.) The portico holding the ramp and the platform, however, is the only element of the building that we can consider completely finished and constitutes, as everybody knows, an example of Gaudí’s genius and mastery and a major work of vaulted architecture. What we first considered access to the roof, our initial idea was to use the main ramp as Gaudí had intended, as well as the original lateral accesses. It was the detailed analysis of its condition that led us to question this alternative. The ramp, apart from its function of holding up the staircase, has always assumed that of the roof of the outstanding portico. And as a roof, unfortunately, it has functioned and still functions badly: some mechanically originated cracks reveal the somewhat anomalous behaviour of the portico and the peculiar stalactites located on some of these cracks (and just observing it when it rains) show us a very deficient waterproofing system. Another aspect analysed was its necessary adaptation to the physical or spatial conditions that influenced its construction: the narrowness of its location and the urban environment in which it was placed, dominated by two axes: one almost frontal, perpendicular to the portal, which used to be Zaragoza street; in a way, this axis conditioned a slight twist and displacement as regards the direction of the main axis in order to see as a perspective background to this street the new altarpiece facade, with a personality of its own and isolated, as far as its architecture is concerned, from what was being developed on its right and on its left. A second, imaginary axis could be understood to be linking the foot of the Cathedral, in what was known as Micalet square, where a sequence of powerful, unconnected architectures were to be found, from the old Chapter Hall to the bell tower. A new episode appeared in this sequence to blend them all together, without creating great changes of level or ignoring the pre-existing side features, in response to the large portal that the Cathedral and the City required.

The architectural response, in the words of Joaquín Béther, is probably the work that best expresses the artistic and cultural atmosphere in Valencia city at the beginning of the 18th century, where Italian artists lived alongside Valencian architects, great connoisseurs of stone masonry and excellent innovative mathematicians. This portal introduces the best Baroque composition on a large scale and in a Baroque style. From the general oval of the floor plan, which manifests a closed form and a complete universe, the different elements of the whole stand out. The portal is made up both in the ground plan and in elevation of a triple partition; in the floor plan two lateral concave bodies flank the central convex body, at the same time as with an elementary tangency they form the transition to the Miguelete and Saint Sebastian’s chapel. In elevation, these two lateral bodies are composed of two floors and an attic, forming the axis of the composition. The ground floor, of generous proportions, contains the large entry bay crowned by a beautiful relief framing the name of the Virgin Mary supported by angels, and finished with a crown; in the lateral bodies of the ground floor, two niches hold statues of Saint Thomas of Villanueva and Saint Pedro Pascual. Six large columns serve to delimit the concave and convex forms on the ground floor, and are reduced to the four central ones in the second body; the bottoms are placed on bases and pedestals with sculptures of Saint Vincent Martir and Saint Lawrence. This second body has a complex skylight at the centre, from an ellipsoidal design on a concave plane, which illuminates the central nave by means of a stained glass window depicting the Assumption of the Virgin Mary, renovated after the Civil War in this century, while at the sides that held the...
Canonges. In the case of the doorways, the Council, in considered the end of a long restoration cycle. On the Valencia, a definitive effort was made by the Ministry of Culture to finish the restoration of the interior, which had more serious shortcomings and pathologies that have been started after the Civil War; works were carried out number of factors and opportunities that do not always to stop the deterioration of the Baroque door, popularly taken place, like so many restoration works, due to a the administration, the restoration of the Gothic doorway, favours this type of intervention. These initiatives have afterwards, and thanks to the intense activity of the Bell its complex historic collage-style structure, which the National Cathedral Plan, the restoration of the most important monuments in the city, has on some of its architectonic fragments in recent years in the second stage. Among these extraordinary Archdiocese, the Chapter and the Department of of the most important monuments in the city, has undergone the initiative of a series of restoration works on some of its architectonic fragments in recent years in an autonomous way, we might say, in accordance with its complex historic collage-style structure, which favours this type of intervention. These initiatives have taken place, like so many restoration works, due to a number of factors and opportunities that do not always respond to reasons of value or conservation but attempt to increase the people’s appreciation of the monument. In 1982, on the occasion of Pope John Paul II’s visit to Valencia, a definitive effort was made by the Ministry of Culture to finish the restoration of the interior, which had been started. The works were carried out to stop the deterioration of the Baroque door, popularly called the Iron Door. In 1991, with funds coordinated by the administration, the restoration of the Gothic doorway, known as the Door of the Apostles, was started. Shorty afterwards, and thanks to the intense activity of the Bell Ringers’ Guild, the Miguelete bells were repaired. Under the National Cathedral Plan, the restoration of the most important Cathedral Archives was started, and is now at the second stage. Among these extraordinary opportunities was the agreement reached between the Archdiocese’s see, the Chapter and the Department of Culture, Education and Science of the Generalitat Valenciana to set up a great exhibition of religious art inside the Cathedral, which has permitted and justified the mobilization of public and private funds not only to finance in Spain and in Valencia, besides, the first facade syntactically articulated by superimposed architectural orders, very different from the altarpiece facade popular the previous century.

Between April 1998 and January 1999, restoration works were carried out on the Baroque portal, which was in a very bad state of repair. Valencia Cathedral, one of the most important monuments in the city, has undergone the initiative of a series of restoration works on some of its architectonic fragments in recent years in an autonomous way, we might say, in accordance with its complex historic collage-style structure, which favours this type of intervention. These initiatives have taken place, like so many restoration works, due to a number of factors and opportunities that do not always respond to reasons of value or conservation but attempt to increase the people’s appreciation of the monument. In 1982, on the occasion of Pope John Paul II’s visit to Valencia, a definitive effort was made by the Ministry of Culture to finish the restoration of the interior, which had been started. The works were carried out to stop the deterioration of the Baroque door, popularly called the Iron Door. In 1991, with funds coordinated by the administration, the restoration of the Gothic doorway, known as the Door of the Apostles, was started. Shortly afterwards, and thanks to the intense activity of the Bell Ringers’ Guild, the Miguelete bells were repaired. Under the National Cathedral Plan, the restoration of the most important Cathedral Archives was started, and is now at the second stage. Among these extraordinary opportunities was the agreement reached between the Archdiocese’s see, the Chapter and the Department of Culture, Education and Science of the Generalitat Valenciana to set up a great exhibition of religious art inside the Cathedral, which has permitted and justified the mobilization of public and private funds not only to finance in Spain and in Valencia, besides, the first facade syntactically articulated by superimposed architectural orders, very different from the altarpiece facade popular the previous century.

Collaboration with the Institute of Spanish Historic Heritage for the Baroque and the Polytechnic University of Valencia for the Romanesque, had had petrologic and pathologic studies performed on them along with documentary research and photogrammetric surveys, in order to discover the extent of the damage. In fact, the Baroque portal had been bounded for scaling off for some time, but it remained evident that the preventive work was carried out from the beginning, because the 1982 intervention had actually precipitated the serious deterioration process. The complexity of the monument, from the first sketch to the final work, is one of the most remarkable efforts in the history of architecture, because it involved a brilliant text. Paul Auster in his City of Glass (1987), through the mouth of one of his characters, elaborates and plays with an elegant theory about who wrote Don Quixote de la Mancha, or rather the book within a book that Cervantes wrote, which he imagined he was writing as an attack on the dangers of pretence. What a brilliant metaphor about restoration! The starting point is suggestive, Don Quixote was no more than Cervantes’ double, who devoured those books on knight errantry, hating them with such force that one cannot help thinking he loved them with just as great intensity. But who is this Cide really? From the quotation transcribed, quite a reflection about the creation and re-creation process. If we could say, we can gather ironic references to some of its protagonists, the role each of us plays in the work of deconstructing and establishing “virtual texts” by updating the original work. Who is Cide Hamete Benengeli in the restoration of Don Quixote’s story? The variations about the assignment of roles are mutu and varied, as in restoration, but the important thing at heart is that the monument should be able to convey information and emotion. So the usefulness of this reflection, although it may be rather obscure and occultist, may reach pathologists and epidemiologists, diettanti and connoiseurs, or even seekers of magic formulas. Another aspect of the problem is acknowledging the attempt to rationalize the memories of the process, construct the memory of those who intervene and, in a half-conscious, distorted way, mix up what we did with what we would have liked to do if we had known what we do now, some time afterwards.

At the foot of the central nave there was a Gothic portal built at the same time as the prolongation of the last aisle by Francesc Baldomar and Pere Compte, who joined the bell tower and the chapter hall to the original nave. We do not know its design or imagery, although the most direct reference could be the doorway into the chapter hall, built at the same time. Strangely enough, the document providing most information about the Gothic door is Padre Tosca’s hand-written plan (1704), showing two interesting facts: one, the gable and cross finish rising from the terraces of the central nave and the other, the existence of an oval or circular atrium, a clear sign that there had previously existed a Baroque solution. The different data discovered about the building of the Baroque door implies that a minimum part of the Gothic door must have been dismantled and new work was carried out on the face built in the 15th century suitably linked. Both the base and the central portion carried out in September 1704 indicates that, as regards work on the deterioration of the new door giving on to the Chapel of the Covarrubias, three 8-inch spans (palmos) thickness could be removed from the closing wall thus gaining a little space, sufficient to develop the curvatures. In the 1724 examination too, the existence of bonds and headers between the new wall and the old was discovered, and for greater safety and solidity at and below window level, it was decided to put them in the place where there were not any, and it added: “... as for the window and the light that it can let in, according to the work executed, there cannot be more than 15 palmos of light, and we must yet warn that four palmos of new wall must be added on to the old, so that it is clear to see it will be difficult for the light to get in...”. These dimensions suggest, and this is a hypothesis that has not been verified by exploration, how the Gothic fabric, which should measure eight palmos, was increased in four more palmos, and probably even more at certain points of the curvatures, which would be finished with two exterior layers of ashlers and a filling of lime mortar. The first news we have of a wish to renovate the old Gothic doorway appeared in Doña María Ana Mont i d’ Aguilar’s will, as far back as 1621, where it said that at her death and that of her sister all their fortune would go to the Cathedral Chapter for the building of a magnificent portal and doors beside the Campanar. In 1701 the Chapter decided to hold a public competition for the presentation of models for the future work, and works were submitted by Juan Pérez Castiel, Main Master Builder of the Cathedral, Master Francisco Padilla, who had already worked on other parts of the cathedral and the Church of the Kings of the Royal Family, Conrado Rodulfo in the Spanish version, recommended by the scholarly Canon Pontons. After several alternatives, among others a unified proposal, the Chapter decided to choose the project of the latter, undoubtedly the most innovative of the three, after hearing the reports of Tomás Vicente Tosca, Félix Falcó de Beloachaga and Master Rafael Martí, who represented the modern circle of the Novatores (innovators). The decision of the Chapter specified that Master Francisco Padilla would be commissioned to work on the most purely constructive aspects. Rodulfo’s proposal developed the doorway in a compound concave-convex-concave plane, inspired by the Italian Baroque he considered himself a disciple of, capable of achieving a greater spatial development and a singular adaptation to the small existing space, achieving with them, besides, several axes and points of view. This proposal was completed or formed part of the oval of the atrium, renewing the existing one, whose closing was projected with a balustrade and railings. The winner showed a preference for composed order and an iconographic programme dedicated to the Assumption of the Virgin and the Valencian Church. The presence of the Miguelete and the wish to place the facade opposite the axis of the now disappeared Zaragoza street made him contemplate twisting the oval to adapt it to this complex situation.

In the works agreement, signed in March 1703, Rodulfo is commissioned to do all the sculpture and ornamental works and Padilla the building works, and some sketches, no longer in existence, defined what Rodulfo was to do in white Benimagel stone whereas Padilla’s part, to be executed in dark Godella stone, was marked in dark shaded areas. After the private contract entered into with the latter and since most of the works involved stoneworking, Padilla in turn contracted or subcontracted master stone masons Domingo Laviesca and José Miner both to extract the stone, cut it and put it in place. On the death of Francisco Padilla, which took place a few months later, in December 1703, preventing him from participating personally in the work, Rodulfo was the only remaining with the preliminary job on the Gothic doorway, his widow had the contract made over to their son José Padilla, who maintained the contract with Laviesca and Miner, two of the most important and expert master stoneworkers in the trade.

From that time on, 1703, the first stage of the works was performed, lasting until May 1707. Conrado Rodulfo, who supported the house of Austria in the Austrian War of Succession, is known to have left the city until that date, first for Barcelona, and then, after the final defeat,
for Vienna. An exploration carried out on the occasion of his departure found that almost all the first body or first floor of the doorway was finished, and that only one of the six columns and the medallion over the doorway were still missing and the statues of Saint Pascual and Saint Thomas of Villanueva were found incomplete in the sculptor’s workshop with other finished material that was to be assembled. The works remained at a standstill until 1713, when the Chapter held another competition to complete the first body, which was adjudicated to Master Builder José Padilla, Master Stone Masons Laviesca and Miner and sculptors Andrés Robres and Luis Esteve. These works were completed in December 1716, not very carefully executed, as the inspection that the Chapter commissioned denounced, among other shortcomings, the existence of large plaster-filled joints in the frieze and plaster covering up brickwork filling between the columns. Special mention is made of the second column on the Miguelete side, deemed immediately faulty and uneven, which must correspond to the one that was missing in 1707, built by Laviesca with stone from the Enoves quarry. At that time the cornice and the relief over the doorway was left unfinished. The works were once again interrupted until 1722, when they were restarted and the cornice was completed following the advice of Padre Tosca and the sculptor José Capuz. Two years later, the upper socle or base of the facade was finished and a new inspection was carried out on it, as the plain work with the stone from the Godella quarries, by Padilla, Laviesca and Miner, was always ahead of the ornamental stonework; at this time the difficulty to increase the facade wall arose and was solved by means of large slabs on the lower perimeter of the facade of Saint Sebastian’s Chapel. In 1727, the Chapter commissioned master stone masons José and Tomás Miner, father and son, to extract and transport enough white stone to decorate the second and third bodies, not specifying in the documentation studied by Fernando Pingarrón that it was to come from the little quarry in Beniganim port, between Genoves and Xàtiva, merely indicating that it must be from the same quarry as the stone for the columns and contracting sculptor brothers Manuel and Francisco Vergara the elder to work this stone. When José Padilla died in 1729, his brother-in-law, sculptor Andrés Robres, took his place and finished all the plain stone work of the doorway in 1731. In those years, Francisco Vergara started the sculpture and relief work of the second and third bodies, beginning with the crown next to the cross and then going on to work on the sculptural group of the Assumption corresponding to the third body. The separate pieces of Saint Laurence, Saint Vincent Martyr, Saint Vincent Ferrer and Saint Luis Beltrán were made by the same author between 1733 and 1734. The last statues, made between 1739 and 1741 by the German Francisco Stolf, of Saint Pascual and Saint Thomas of Villanueva, were placed in the niches of the first body. The sculptural activity of the famous Ignacio Vergara, son of Francisco, concentrated around 1750 on the decoration containing the name of Mary surrounded by angels over the entrance. The doors, installed in 1758, were covered in brass in that year also, according to the designs of Félix Lorente and Salvador Romaguera. It is interesting to point out that in the initial work agreement the second body was made and a new inspection was made at the crown next to the cross, therefore, there is mention of a closure with twenty-four banisters, knobs, railings and two lions beside the doorway, and a checkerboard design with stones from Ribarroja and Moncada on the floor. This was all completed between 1737 and 1741 to Rodallo’s design. However, thirty years later, in 1766, for no known reason, Salvador Romaguera was the task of designing a new closure for this porch, which was built and completed in 1772 by the masters Asensio Sanchis and Tomás Miner, with grey stone from the quarry at Cabettor, near El Puig. The result is the bench with the seat facing inwards and the undulating profile on which the rails is located. What was the reason for this renovation?In 1982 there occurred one of the last initiatives in the long restoration process of the interior and exterior of the Cathedral carried out after the Civil War, a restoration work carried out by architect Fernando Chueca on the occasion of the coming visit of Pope John Paul II to the city. The immediate reason for the intervention on the Iron Doorway was its advanced state of deterioration and the fact that it was planned as a final stage of the restoration work. The justification report of the emergency works, dated May 1982, before the works in August of the same year, speaks about alteration caused by atmospheric agents, the use of auxiliary iron devices, or clamp pieces that had disappeared due to rust and even the loss of up to 15 cm in the verticality of some of the columns, although there is no record that anything was done about this. In the month of September, when the works were finished, the final report says that the facade had been weakened by leaks and the joints due to the lack of sheets of lead over the cornices. This degradation process, as the application of protecting patinas discovered in recent tests has shown, seems to have appeared throughout the 19th century, and was not related to any action taken against the weathering. Beginning but according to the criticism of Mosén Jesús Juan Pérez, son of architect Juan Pérez Castiel, the great loser of the 1701 competition, who in a report about the three proposals presented, mainly drawn up for the purpose of praising his father’s project, pointed out that all the ornamental work in Rodallo’s design would deserve to be better protected as it was exposed “...to the incompatibility of the weather undergone by said doorway...” and was likely to suffer rapid deterioration. The restoration process followed by the team under the direction of Chueca Goitia consisted of setting up scaffolding to create work areas and clamping loose pieces with rustproof elements with epoxy resin, partially cleaning the stone and rejoining it, and applying a colourless coat of silicon to the whole facade. A layer of fibre glass, resin and gel was applied to the cornices and projections and some replacements were made with epoxy resins and silica sand. The fact is that most of these treatments, applied over the plaster surface or the altered stone, hardly penetrated and had a negligible effect. To unjustified opinions, based on ignorance, about the negative effects, the geologists who had performed the preliminary survey on the doorway, Navarro Gascón and Pérez García, replied: “...the only positive effect to be attributed to these products is the temporary protection they have provided from the rain and its associated consequences in relation with salt precipitation...” and they add: “...the concentration of salts may have been increased by the presence of the acrylic films or epoxy mortars applied in the 1982 restoration works, although the state of deterioration the monument suffers today is not a direct result of this but was inherited from an exposure process that was already in a very advanced condition in the upper body before the intervention. These treatments, on the other hand, have exercised a sheltering effect from the direct action of rainfall. One of the most interesting and suggestive aspects of this doorway, both from a pathological, restoration point of view and a formal artistic angle is the presence of different products applied over the stone. On the basis of all the documentation in existence referring to its long constructive process, we can trace the evolution of the application of patinas. In the oldest data there is no direct reference to the intention to apply a patina to the finished stone, but rather the intention of leaving the stone bare. In the draft of the agreement referring to the dark stone that was originally meant to be from Ribarroja to contrast strongly with the Beniganim stone, and in a similar way for the white stone, we found the following text: “..leaving it all vertical and level and well worked according to good stonemasonry practice, so that the whole work will be nicely harmonized, both inside and out; and the joints must be as small as possible; and all the stones must be finely cut...” However shortly afterwards, in the contract made between Francisco Padilla and the Chapter in 1703, we find two new considerations about the finish in two chapters of the final text: *xxiii. Furthermore: May all the joints of the work, after being well fashioned with thin white mortar and polished, be painted the same colour as the stone with paint made of mineral earths distemptered with clear water so that the white of the joints cannot be seen; and besides, all parts stained with lime or mortar will be painted, but this must be freshly done after polishing, and the same applies to the stains.[...]* . *xxiii. Furthermore: May all the Godella stone that is on the front or the surface of said work be covered with thin, high quality mortar after cutting with a fine engraver.* On the other hand, the fact of looking for two stones with different texture and colour appears after the stage when the wax models were chosen, with a view both to facilitating the carving of the sculptural part and giving consistency and economizing on the basic structural part of the doorway. The ornamental stone is a white, fine grained stone, to be used even in columns, niches and friezes; the Godella stone is dark and Travertino-like. These differences, not yet mentioned, the start, leave us with the important doubt about whether this two-coloured finish was to be left visible or covered up by the author and the Chapter, and it was on actually building that the final solution was decided. In this sense it must be borne in mind that whereas the plain stone was cut and installed supposedly on site, the Beniganim stone was sculpted by Rodallo in his workshop, a house that the Chapter had rented in his name in the Market district, which involved important maladjustments in assembly. When one of the examinations was carried out in 1717 to verify the suitability of the masonry of the first body that Padilla, Miner, Laviesca, Robres and Esteve had undertaken to finish, the following flaws were pointed out: “Furthermore: That in the frieze some very large joints were found, full of plaster which must be filled in with cut and well adjusted stone must be situated.” In the first of the cases, the restoration works have shown how these repairs were carried out, eliminating the maladjustment between the slabs of the frieze and their plaster filling, which so badly marred this delicate work and, besides, went against the agreement signed in 1703 with Conrado Rodallo, clearly specifying that the white stone must be placed in pieces as large as possible and “...set in place with the smallest and subtlest joints possible...”, which shows how much stone was set by this part of the building. Again in an examination, a complementary source of information of great value to determine the state of the construction and its quality, this time carried out by the architect Felipe Rubio, commissioned by the Chapter, in 1734, he says that in order to complete the doorway, the dark stone requires having been filled in, the joints straightened, the stone cleaned and the whole coloured in imitation of it, according to the dispositions of Chapter 23...”. The following month, another examination carried out by José Minguez and Gaspar Martinez for the same purpose, in a clarifying
statement, says:

"Insofar as Chapter 23 says that all the joints of said stone must be straightened and sawn with white mortar, and then painted with a paintbrush in mineral colours imitating the same stone, at the same time as said Masters saw, according to the Chapter, the Curators in charge of said doorway have considered, for greater permanence and better imitation, that said joints should be painted with stucco the same colour as the stone, which we have seen so executed in said Body. And it was a great decision by these Gentlemen that it should be so done as stucco is more natural and permanent. And water will penetrate better into the work in time, even though it be done in fresco..."

If we pay attention to these remarks, we may deduce that what had originally been intended as repair for joints and stains, at the end of the construction of the doorway, had become a stone finish that actually respected the different colour of the stones and which ended up being extended to the ornamental stone because of the flaws in execution and harmonization with the natural stone. Both in the Study of Stone Materials and the actual restoration process, more tests were performed to determine the characteristics of the putains. In both cases, the conclusions were similar: all the surface of the facade, including the sculptural groups and ornaments, was covered, in a greater or lesser degree, by crusts and putains. That is to say, it is clear that the intention of protecting and dignifying the bare stone and its joints was extended to the whole doorway. There is proof of the existence of a putain formed by gypsum and calcium oxalate, with small amounts of protein (casein or albumin) used as an agglutinant as an initial treatment for the stone, and a second, thicker coat made up of gypsum, a certain amount of calcium oxalates and soluble salts. The conclusions that can be reached are extremely interesting as it is possible to distinguish the first, original putain, applied at the time the doorway was made, with pigments of natural earth ochres, reds and black vegetable carbon; in the second place, a black crust, caused by a series of later coats, at least two on the first body and five on the second, with the addition of gum arabic and small amounts of linseed oil. The reports adds: "...the remaining coats are plasters formed of complex mixtures with different proportions of lime, ochres and black, with artificial ultramarine in the most superficial coat, which tells us that it was a recent intervention practiced later than the mid 19th century. The layers of plaster that are not original traces of insoluble protein (casein or albumin) have been detected".

The existence of putains on the stone suggests different things, both from the point of view of the image of the original work and its transformation in time, leading us to tread unforeseen paths such as issues about the evolution and degradation of this fabric. The truth is that these protective or beautifying plasters have been the object of more or less intensive cleaning in some cases to such an extent that they disappeared altogether in the most exposed areas, and in other cases they have turned into black crusts due to the formation of salts, and, finally, we must underline the undeniable deterioration process caused by the non-evaporation of the water that had seeped in unprotected zones, provoking an irreparable loss of volumes. In this way, the putains become one of the protagonists of the restoration.

Several times throughout 1995, the Dean of the Cathedral addressed the Department of Artistic Heritage of the Generalitat V alenciana, both verbally and in writing, to inform of the existence of detachments, either of ornamental elements or plasters, from the Baroque doorway, with the subsequent hazard to people going through the porch and a serious problem for the conservation of its architecture. In December of that year the Department of Artistic Heritage commissioned the Architecture Service to adopt the necessary urgent measures to protect the public and the doorway. The proposal made, and put into practice, involved setting up tubular scaffolding with work areas at different levels to proceed to a study into the causes of the deterioration and decide on the necessary steps. In the meantime, install galvanized netting (chicken wire) on the third body, which was the most seriously damaged, and another polyamide protection net, more closely woven at the bottom to catch any elements that might come loose. The worst affected joints and third bodies were protected one by one with individual nets after their stability had been checked. These works, carried out during the months of February and March 1996, made it possible to start the surveys into the state of conservation of the doorway, into the collaboration of what was then known as the Institute of Conservation and Restoration of Cultural Monuments, a department of the Ministry of Culture. After some first visits of inspection carried out by José Vicente Navarro and Concha Cirujano, an initial report was drawn up, which evaluated the conservation of the first and second bodies in comparison with the third, where a surface crust had been found that was several centimetres thick and underneath which the rock was in an advanced state of breakage and pulverization with deep cracks and a series of detached elements. In view of all this, an in-depth study of the doorway was proposed for the purpose of determining causes and offering possible solutions. Parallel to this, a technician from the Department of Monuments and Archaeology of the Ministry of Culture drew up another report going into detail about the seriousness of the problem and suggesting as possible solutions that moulds be taken of the damaged sculptural pieces before any more loss of definition took place, the original pieces be taken down and restored, consolidated and reassembled in a museum, and a replica located on the doorway. Given the seriousness of the situation, the Survey of the Stone Materials of the Baroque Doorway of Valencia Cathedral was commissioned by the Department of Culture, Education and Science, coordinated by what was then called the Institute of Spanish Historic Heritage. This was to be drawn up by the geologists José Vicente Navarro Gascón, from the Institute, and Pedro P. Pérez García, engaged by the Generalitat V alenciana. This preliminary survey, after an introduction and setting out of aims, focused on the study of the architecture of the ensemble and analyses the restoration carried out in 1982 as one of the possible causes of deterioration, later compiling data about the environment. The actual survey is divided into three sections, dedicated to the general state of conservation, a study of the stone materials, alteration products and restoration treatments and conclusions. All of which is completed with the corresponding annexes containing the results of the tests techniques used. In the section referring to the state of conservation, we would like to underline the methodical and exhaustive description of the damage to give a first impression: "...the state of conservation of this Baroque facade is differential: the crowning and third body are seriously deteriorated, with irreparable damage in some cases, whereas the lower bodies present an acceptable state of conservation. A first analysis of this fact permits us to state that, apart from the existence of other causes, one important factor in the degradation of the cathedral fabric is the greater or lesser degree of exposure steps for its restoration, and in differential deterioration between the two predominant types of stone: whereas the Godella limestone is in a good state of repair, the Benigamim stone is very seriously damaged in many cases." The conclusions of the study underlined the following issues:

- three stone types were identified in the doorway: the dark Godella stone, the white Benigamim stone and a third type, pinkish in colour, used very sparingly. We must add to this that the denominations of origin thus used appear generically; in fact the so-called Godella stone, according to the documentation, seems to have been obtained both in the quarries of that town and near Moncada and Ribera, while the white stone for the first body came from Benigamim but was later extracted from quarries near it or near Xàtiva, such as Burxeta, Enova, etc. The pinkish stone, of which there turned out to be more after the restoration than was originally believed, might have come from these new quarries, where Laviésca, Miner and Vegara worked.

- a series of putains and plaster crusts can be identified, of a different thickness and state depending on the zone, which, as we pointed out above, correspond to original treatments others to the 19th century and finally to the 1982 restoration.

- The main deterioration mechanism was the crystallization of salts with all its complex process of dissolving-crystallizing-moisturizing. Once the rock had been broken by salt crystallization processes, the pulverized material was eroded by the action of rainwater.

The Architecture Service, in charge of the technical side of the intervention, recommended the drawing up of a graphic representation of the doorway with photogrammetric rigour, for which it resorted to the experience of the Departments of Cartographic Engineering and Architectonic Graphic Expression, with which they had collaborated on other occasions. We would like to point out, as something peculiar although normal in Valencian heritage, the fact that there was no reliable elevation of this doorway, of which there was only a drawing accompanying the works of Chueca Goitia, which Navarro and Pérez had called "imaginative".

The fact is that its complex geometry and its great decorative richness, both matters of great intrinsic importance in the value and architectonic definition of the doorway make the usual two dimensional representations, the most common in architecture, look awkward and inexpressive. Not in vain did Conrado Rodulfo present his proposal in a three dimensional model, capable of showing the expressive potential of the project.

While the restoration works were being carried out by the team of restorers from Coresal, engaged to work on the monumental stone, once the finishing had been removed, an exhaustive highly reliable and detailed representation of the ornamentation, decorative and sculptural elements was obtained, indicating the corresponding division of the ashlars that were used and pointing out the pathologies found. These preliminary studies, the graphic representation and the analysis and diagnosis regarding the material consistency of the doorway were basic in the restoration works initiated in April 1998 and completed in January 1999.

To carry out the restoration of an architectonic element of these characteristics in isolation from the rest of the building implies in the first place the definition of the main objectives sought. In this case, it was clear that the aim was to prevent the degradation that was taking place, guarantee its conservation for as long a period as possible and enhance its artistic essence and its historicity. As a wish impossible to fulfill was the recreation of its urban surroundings to make it understandable to both verbally and in writing, to inform of the existence of detachments, either of ornamental elements or plasters, from the Baroque doorway, with the subsequent hazard to people going through the porch and a serious problem for the conservation of its architecture.
free-standing sculptures, although theoretically the Assumption relief was tested in the hope of even their materiality. Many debates postponed the acceptance, and, on the other hand, caused concern. The originals prevented this procedure from gaining natural reluctance to set replicas instead of the works. This was the verdict of technicians from the Ministry of Culture, who recommended the making of a large scaffolding was completely dismantled and the bare stone and contracted workers of most of the ornamental stone and the sculptural pieces. Locksmith Lafuente worked with Minguet on the railings in the porch and the cross, Piró Oñate on the ball on which this cross is situated, María Roselló on the restoration of the stained glass, carpenters Hermans Aron on the restoration of the large entry doors, Julio Bayarrí on the restoration of the brass finish of the doors, restorers Lucas Ruiz Segura and Javier Linares on the stuccoes inside the nave near the doorway and the company Alumarte on the installation of the dove scaring system. Great synchronization was required for all of these to work in combination, as in some cases the craftsmen had to go back over work on the same areas after other restorers had finished, which involved the use of supplementary protection measures to avoid damaging treatments already applied.

The type of intervention in coherence, with many of the decisions adopted in a way that can be considered as not final, requires serious and attentive conservation practice and continual preventive maintenance. For that reason the conservation intervention is a long-term, planned and systemic approach to the restorers who had applied the most unique treatments, with whom the technical directors fully coincided in the establishment of criteria and who have great experience in this difficult subject of maintenance, was asked to draw up a Maintenance Project for the doorway, which was submitted at the same time as the Final Report. Although maintenance or preventive conservation is a subject connected with museum science and therefore with movable property, its application or shift to real estate has certain logic but is not possible to make a literal translation of it. Nevertheless, even for museum science it is a modern conception in which the deterioration and ageing of property is only a multiplier of known and usually controllable causes, to which mechanical, chemical and biological data is added, factors that can be controlled in a museum but not easily in the case of architecture and, therefore, exposed to long-term, complicated to control natural conditions and pollution. That is why the Maintenance Project establishes the following as its basic principles: conservation and preservation aims, economy in each of the tasks, long-term planning and periodic revision of the original diagnosis and minimum intervention. The maintenance project is based on a preliminary analysis on the grounds of existing documentation; a study of the alteration agents, quantifying their effect on the different elements; making provision for the pathologies arising from these alteration factors; safety coefficients to be applied; and the drawing up of a control and intervention manual, setting out the ideal periodicity of same. Let us hope that “conservation culture” is up to the task in the near future and capable of putting into practice this difficult project, much more so than the emergency restoration works carried out. If not, one fine day the Dean of the Cathedral will inform I do not know whom of new problems and breakages. Then Cide Hamete Benengeli will write another text. This is how Paul Auster finishes his borgian hypothesis: “But he still has not explained how a man like Don Quixote would disrupt his quiet life to undertake such a complicated hoax. That is the most interesting part of all. In my opinion, Don Quixote was making an experiment. He wanted to test the gullibility of his peers. Would it be possible, he wondered, to stand before the world and vomit out lies and nonsense with absolute conviction? Tell them that windmills were knights, that a barber’s basin was a helmet, that puppets were real people? Would it be possible to persuade others to agree with what he said, even though they did not believe it? In other words, to what extent would people tolerate blasphemy if they found it amusing? The answer is obvious, isn’t it? To any extent. Proof of it is that we still read the book. We still find it extremely amusing. And in the end this is what one wants from a book, to be amused by it.”

Juan Francisco Nuñez

A square for a cathedral

An urban project competition has been recently held in Valencia for the restructuring of Reina square, arousing interest among architects and quite a few citizens sensitized to city issues and alarm in the municipal authorities because of its repercussions. It is an emblematic space in the city, with a long and controversial history. The competition was promoted by the Professional Association of Architects in the Valencian Community, in a historic attempt to engage in offering solutions for the problems in our territory, with the collaboration of the City Council. And it afforded an opportunity to provide a newly restored monument with suitable surroundings.

Short history & background of the competition

The current space limited by the cathedral at one end and the buildings in Pau street at the other was occupied by five blocks of dwellings until the last third of the past century. These no longer existing buildings along with those around the sides of the current square formed Zaragoza and Campaneros streets and Santa Catalina and Miguelete squares. In 1874, as a consequence of the final opening of Pau street, the block situated between Mar street and Horno de la Ceca street was knocked down to form a triangular space that was the seed that gave birth to the current square, its name as Reina square and its management and configuration system carried out by the expropriation of buildings without a clear policy. After the 1930s, successive expansions were performed, not responding to any of the proposals made until mid century by Federico Ayamín (1908 and 1910), Rafael Alfaro (1910), Carlos Carbonell (1921) or any of the many made by Javier Goerlich (1929, 1935, 1942, 1950). It is sad to see that none of the projects made with an overall criterion was implemented, not even that by Vicente Figuerola, which won the 1951 competition held by the City Council but considered unfeasible and discarded. Nevertheless, demolitions continued until the current space was configured. Aside from the absurd projects by Ayamín (1908) and Javier Goerlich (1929, 1935 and 1942), proposing the prolongation of Pau street with the ensuing demolition of...
Santa Catalina church while leaving its tower standing on its own, very much criticized by its colleagues and the professional Association of Architects, the proposals of those years, including the above mentioned, respected a little square beside the cathedral, Micalet square, and a large one, Reina square, rectangular, almost perfectly square in shape, separated from each other by one of the blocks still standing or a new edifice that had taken their place. The maintenance of the end of Zaragoza street was another constant, respecting its line or modifying it according to the proposals, with the intention of framing the Baroque iron portal (Puerta de los Hierros) or expanding it to suit the vision as far as the Miguelete. The latter steps involved knocking down the building that currently hides Santa Catalina.

The history up to the time this new competition was held is quite well known and we can summarize it as the total emptying of the square achieved by demolishing the last houses around 1965, thus definitely losing the compositional axis of the Baroque portal, folded over itself, it seems, to be contemplated from Zaragoza street. The building and inauguration of an underground parking lot in 1970 gave the finishing touches to its present appearance to the parking lot and bus stops occupying most of the central space. The controversy that has recently arisen when the back of Santa Catalina apse became visible from the square due to temporary and unforeseeable circumstances was fortunately cleared without a conflict. The professional Association of Architects contributed to the polenic, and those who believed that the square should have its original borders and the damaged side restored eventually prevailed.

To make a long story short, at present we have a gap caused by successive demolitions carried out without a clear purpose as regards the configuration of the square. A large space with constructed edges inherited from an earlier lay-out, not projected as the limit of the current square; a gap through which the traffic passes, scattered with obstacles placed to respond to bodily resolved needs; a square that does not enhance the monumental architecture as it should. A cathedral whose Baroque portal has recently been restored and that does not have enough space to show it up and provide it with suitable scale.

The competition
With the eventful history briefly told and the intention of putting an end to the long process of unsatisfactory repairs, the official Association of Architects in the Valencian Community held the Reina Square Competition in the conditions explained at the beginning, with the desire to give the city of Valencia a proposal for an urban intervention to order and configure the square, thus recovering its space as an emblematic spot in the city. The aim, as could be seen in the Conditions of the Competition, was to select the project that, in the opinion of the Jury, best enhanced the value of the square as a meeting place for city dwellers and an articulating space in the city. The axis consisting of the garden of the Turia river, Virgin square, Reina square, City hall square, the railway station and Central Park is one of the keys to the Valencia of the future.

The Jury was made up of: Vicente Casanova, President of the Territorial Association of Architects of Valencia, as chairman of the Jury, the architects José Rafael Moneo, Jesús Alonso and Francisco Mangado, the architect Román Jiménez representing the Territorial Association of Architects of Valencia, in the opinion of the Jury and as recorded in the Minutes of the granting of prizes, “resolves the problem as a whole”, “is outstanding in its unity” and at the same time has “the merit of establishing differentiated zones simultaneously, to underline the functional character and the diverse uses”, gives new meanings to other aspects such as “the facade of the Cathedral” and highlights “the well-adjusted layout-out of plants in the space” and “the sensibility shown in the use of the different species”.

This proposal presents special sensibility and good judgement in integrating distinctive historic themes of perspective and scale in an up-to-date concept of a square free from obstacles and used only by pedestrians. No violence is perpetrated on the current space and its readability. An ingenious design to find the memory of the historic perspective of the Iron Door, the recuperation of a space in front of the cathedral that sets it off and a museum annex, the crypt, with possible archaeological value, but respecting and at the same time transforming the current empty space, because this, after all, is history too. The diaphanousness of the space is a positive point to permit a plural use of modern social activities and any changes that may come about in the future.

The square is defined in our memory as a complex space used by pedestrians, with restricted traffic. Two main areas can be distinguished: one near the south facade of the cathedral, limited by the old parcelling and coinciding with the perimeter of the Roman city of the Republic period; on a slightly lower level we can see another area, where the line of old Zaragoza street can be seen. A triple line of deciduous trees of the muliciosa family joins the trees in San Vicente street, softens the borders and helps configure the walk towards the Baroque portal, which can be seen in all its glory by passing over an urban footbridge 10 metres wide leading right to its centre. A linear bronze sculpture evoking the Corpus Christi procession –based on images by Bertam Tarín (1913) and Joan Renau (1963)– serve as a railing.

The part of the square nearest the cathedral is a plane sloping slightly towards the historic facade; under which there is an archaeological crypt partly opened to the exterior by means of a 2 x 13 m split parallel to the footbridge mentioned above to let in the light, apart from a 20 cm crack opened to the south, parallel to a longitudinal fountain separating the two areas mentioned.

The crypt–situated at the -5.30 m settling level of the Valencia of 130 B.C.– is proposed as a space for a possible diocesan museum and to hold the archaeological remains of the city’s foundation. A granite bench in the square is a remnant of the Roman wall of the Republic period. Some oak trees and a cluster of date palms–providing perspective from San Vicente street–sitting on longitudinal bands of lawn-covered ground constitute the two ends of the central platform, whose slightly polished grey granite pavement is characterized by a pattern of longitudinal strips separated by a 2 cm ledge. The group of palm trees recalls the original Reina square. The lighting of the square is resolved in an original manner by narrow strips built into the pavement described above with optic fibre illumination, which will make the pavement look especially attractive at night. The general proposal, rich in nuances and ideas, is particularly sensitive as far as the design of both the ensemble and each of its elements is concerned. It is an opportunity that the City Council can take advantage of to reposition the pending 2051 the City Hall considered Figuerola’s project unfeasible and did not carry it out. Fifty years later we trust history will not repeat itself, especially as the current project is good, not polemic, and has the indisputable advantage that it solves historic difficulties, provides new perspectives and suitable surroundings for the cathedral and its Iron Door or the Miguelete. Sooner or later this square will be restructured. It would be difficult to find an occasion and a project more suitable than this one, providing just the atmosphere for the newly repaired monument.

Camilla Miletto

Reflections about the stratigraphic Analysis of Fabrics

"Stratigraphy" is fundamentally a methodology that makes it possible to individualize and document the legible material data about fabric, both in the case of archaeological beds and buildings. This methodology of "stratigraphic analysis" as we understand it today stems directly from the application of archaeologist Edward C. Harris, who in 1979 published his Principles of Archaeological Stratigraphy, a work which became a reference point for the discipline of archaeology from that time forward. Although for over a century archaeology had been considering the need to carry out excavation from a stratigraphic point of view, in other words by following the strata of the bed, Harris’s research was a key moment in the systematization of this methodology: the definition of the principles of archaeological stratigraphy by means of the re-elaboration of the geological laws of superposition. Its study is aimed at the chronological aspects and diachronic and archanonic relations of stratification, not directly at historic interpretation.

Harris himself was responsible for the introduction of stratigraphic studies on walls as elements present in archaeological beds. In any case, the first applications, the systematization and development of the methodology for the stratigraphic studies of elevations is mainly due to a group of Italian archaeologists (R. Parenti, F. Francovich, T. Mannoni, F. Bonora, G. Brogiolo, etc.), who started a debate on the subject in the eighties and published their works in the magazine Archeologia Medievale. At the same time, the contributions of some architects from the Department of Architectonic Restoration of the University Institute of Architecture in Venice (R. Barrardini, F. Doglioni, B. Gabbiani, etc.) and the Department of Architecture and Restoration of Monuments from the Faculty of Architecture at Florence University (C. Pietramellara, L. Marino) are fundamental. In Spain, the work of some archaeologists on the subject has also been outstanding from the start (A. Arkárate, L. Caballero, P. Latore, L. Cábara, A. López Mullor, ...).

Some fundamental concepts and definitions
It is worth making a brief mention of some basic concepts of the method of "stratigraphic analysis" and providing a few terminological definitions to help understand the application phases of the methodology. Specifically, we shall try to clear up some concepts connected with the application of the method to architecture.

Stratigraphy of surfaces. The "stratigraphy" or "stratigraphic analysis" applied to architecture must be understood as a reading of the surfaces of the building currently visible, in other words a process of individualization from the material data taking place directly on the building and requiring a transcription procedure, a "stratigraphic survey", to be transmitted, consisting of a record of the observations in the form of a written text, a drawing or a diagram.

Stratification. The concept of stratification comes from geology, where it is considered to be the set of cycles of erosion and accumulation that bring about the formation of strata. When shifting the concept of stratification from geology to archaeology, anthropic action must be added to the process. Stratification (be it archaeological or architectonic) is considered to be the product of constructive (positive actions), destructive (negative actions) and transforming activities due to the anthropic
actions or modifications brought about by natural agents. 

Aeolian stratun. The aeolian stratun is what is currently conserved of a unitary constructive action. It is made up of a "stratum body" (mater deposited and structured during the constructive action) and two "stratum surfaces" that delimit the stratun. In the case of the fabric study of a wall, the stratun surfaces notably increase in number due to the presence of openings. Besides, the wall stratun proper is often covered by 

coating (plasters), which are in turn covered by stratum surfaces. The external surface of the stratum, in other words, the one left intentionally on view, can also be described according to the different degrees of intentionality of the superficial treatment that characterizes it.

In the stratigraphic analysis of surfaces, since excavation is not taken into account as in archaeological beds, in most bodies it is only possible to observe and study the surface of the aeolian stratum and not the entire body of the stratun.

**Negative interface.** The negative interface is the surface bearing the traces of demolition or removal of a stratum (negative action). It is consequently possible to read the information dealing with the modality of the negative action that has taken place.

**Virtual unit.** By means of studying the negative interface it is possible to construct hypothetically the virtual unit or the part of the stratum that has been destroyed.

**Perimeter of the stratum surface.** The perimeter of the stratum surface is the external perimeter that delimits the surface recognized as unitary or, in other words, homogeneous for its own features or physical discontinuity with adjacent surfaces. The examination of the homogeneous surfaces is based on the observation of the largest number possible of features of the surfaces themselves: materials used, chemical composition, granulometric composition, colour, wet, dimensions and processes and techniques of elaboration, surface treatment, constructive technology, etc. It is also important to remember that the edge of a stratum surface will at the same time be the edge of the adjacent surface and will contain information about the type of contact between the two surfaces, by which the stratigraphic relations that exist between them can be recognized.

**Wall Stratigraphic Unit (WSU).** A wall stratigraphic unit is defined as a unitary action (positive, negative or transforming), that is to say carried out within the sphere of the same intention, made up of one or more surfaces and the perimeters that define them. Each stratigraphic unit acquires in such a way the material features of the surfaces that it is composed of and will carry out a dialogue with the adjacent units according to the stratigraphic relations that can be observed on the edges delimiting them. Each wall stratigraphic unit is assigned a number for its individualization and description.

**Relations between WSUs.** An examination of the kind of edge delimiting a stratigraphic unit and an identification of the actions (positive or negative) that have produced that edge make it possible to identify the intensional relations between the WSUs. The physical relations between the WSUs can be contemporaneous, anterior or posterior.

**a. Contemporaneous relations** - A relation of direct contemporaneity, that is to say, it is a continuity between the two WSUs that reveals that one WSU is linked to the other as part of the same constructive process. - The same as: This is the indirect contemporaneous relation or, in other words, when there is no physical continuity between the two WSUs. This relation can be recognized as "identity" (for example they are two parts of the same wall separated by a cut that does not permit a continued physical reading), by "typology" (for example a series of windows made with the same shape, dimensions, material), by "functionality" (for example patios belonging to the same operation).

b. **Anterior or posterior relations:**

- **Leaning/leaning on:** A WSU leans on the wall next to it (both vertically and horizontally) so that the unit leaning will be posterior to the other (e.g. a wall leaning on another).
- **Covering/covered by:** This is a similar case to that described above but it is usually a relation between walls and finishes or between two or more coats of finish. The finish covers the wall, so it is posterior than it.
- **Cutting/cut by:** This is a relation that indicates the negative action of removal and in the specific case of architecture it indicates demolition.
- **Filling/filled by:** This is the relation that shows that one part of a unit was filled by one part of another (e.g. filling in of a gap).

**Stratigraphic diagram (Harris Matrix).** The diagram represents the transcription of the above-mentioned physical relations (contemporaneous, anterior or posterior) in order to specify the stratigraphic sequence. It is based above all on the physical relation "superposition", according to which the upper layers are more recent and the lower ones older and on the "law of archaeological succession", according to which each stratigraphic unit finds a place in the stratigraphic sequence in a position comprehended between the unit situated at the lowest level on which the rest of the stratigraphic units lie and the one located at the top and lying on the rest of the units and with which it makes physical contact.

So it is a question of recording all the physical relations that exist (drawn in continual lines) between the WSUs (except superfluous relations) in such a way as to order the WSUs inside a scheme (Matrix). When applying the method to architecture, it is necessary to bear in mind that the sense of superposition is not unidirectional (like in an archaeological bed) and that only the study of the edges separating them can indicate the order of the sequence.

**Periodization.** Providing the stratigraphic sequence with periodization (represented in the diagram) involves providing a temporal relationship. The oldest units are located at the bottom of the diagram while the most recent are at the top; this is according to a convention arising from a survey of the archaeological bed and maintained also in constructed surfaces to make them easier to read. Periodizing is therefore identifying the temporal periods and shifting the WSUs vertically in the diagram according to the (direct or indirect) relationships linking them to the other WSUs.

**Relative chronology and absolute chronology.** The sequence derived from the periodization of the matrix will, however, only have a relative and not absolute chronology value, in other words, it does not facilitate historic interpretations or particularize historic periods: each WSU belongs to one of the anterior or posterior to or contemporaneous with the other WSUs present in the same diagram. The main aim of the stratigraphic analysis is to construct a relative sequence, but it is always undoubtedly interesting to overlay an absolute chronology permitting the dating of the WSUs and the sequence of the constructive phases of the building. The issue is, then, to set up the relative chronology obtained from the study of the material data of the building with a series of information arising from historic research (written graphic or iconographic documentation) and studies about the "chronological indicators" (the type of material and constructive techniques used, decoration, form and construction of the baYS, etc.). A greater degree of examination will also provide the possibility to apply dating techniques such as "mensurchronology", "chronotypology" or "dendrochronology". In any case it interesting to point out the importance of maintaining the material data collection phase and its interpretation separate, according to a historic chronology, in order to avoid possible a priori options of data on the basis of hurried historiographic interpretations.

**Stratigraphy applied to Fabrics**

As we pointed out above, the first applications of the method of "stratigraphic analysis" to fabrics date back to Harris himself, who treated the walls inside archaeological beds as "vertical strata". Nevertheless, as F. Dogliani states, there are great conceptual differences to be taken into account when applying this method to the vertical surfaces of a building. Above all, "archaeological stratification" constitutes a deposit that corresponds to natural criteria (gravity), in other words it is a "horizontal stratification", whereas "architectural stratification" corresponds to artificial criteria aimed at the construction of spaces, that is to say, internal rooms that will be legible as empty. This peculiarity of "architectural stratification" involves the presence of many other surfaces both visible and legible at the same time, apart from a process of depositing the strata that does not proceed in a single direction, as occurs in archaeological beds. Besides, in the case of archaeology the "stratum surface" represents the physical limit that separates two different adjacent strata, while in architecture the surface does not constitute only a physical limit but also a surface with a finish where the characteristics of the surface are legible. In the same way, in architecture the edges that separate the stratigraphic units take on peculiar characteristics due to the intentionality of their definition.

There are even fundamental operative differences: the stratigraphic reading in an archaeological bed is always associated to an excavation so that once the features of a stratum have been discovered, it is removed. The stratigraphic reading of architecture, on the other hand, is not associated with an excavation, so the strata are legible simultaneously and never entirely. It is therefore necessary to bear in mind that the stratigraphic reading of a building can be more or less complete and exhaustive depending on the degree of legibility of the stratigraphic units.

**A survey case.**

In the text that follows, we present a stratigraphic survey in order to illustrate the application passages of the methodology and at the same time to find the opportunity to present some reflections about the possibility of the method. The stately palace of Villa Giusti-Puttinu in Santa Maria in Stelle in the province of Verona (Italy) stands as the main building in a pre-palladian town, whose existence has been documented since 1445. The building, an old stately home, did not arise out of an organic project, but from a stratification of modification works that were often found to be necessary: it is the combined expression of the action of generations of owners who have adapted the dwelling to the dictates of fashion and the times. The inside rooms follow the hierarchical layout typical of stately homes with large reception halls, small private rooms and servants’ quarters. Some rooms show an interesting combination between the architectural configuration and the mural painting: two large rooms, one on the ground floor and one on the main floor, with walls bearing frescoes from the second half of the 16th century; a side room with frescoes from the first half of the 16th century, and a little dressing room on the top
floor with frescoes from the end of the 15th century and the beginning of the 16th. In the room on the ground floor, underneath the fresco currently visible, an earlier layer with frescoes from the first half of the 16th century can be seen in the gaps in the upper coat. The building constitutes an ensemble of more or less legible stratigraphic fragments arising from modifications and re-adaptations (with a great evocative and narrative force telling a temporal tale).

In the case of the Villa Giusti-Puttini, the "stratigraphic survey" of the surfaces forms part of a more complete study of the building (historic analysis, metric-stratigraphic fragments in the materials and structural pathologies) aimed at discovering the time and the place that restoration should be carried out.

According to F. Doglioni, the "stratigraphic survey" is made up of three phases: the first devoted to individualization and observation of data of interest, which must be done directly on the building, and the subsequent recording of same on a graphic or photographic support; the second where the WSUs are identified on the basis of the data collected and are set out in cards or suitable registries; the third to interpret the information gathered and re-elaborate it by means of Harris's diagrams or hypothetical reconstructions of transformation phases.

Data collection and WSU identification. As we said above, the first phase of the stratigraphic survey foresees the transcription of the "stratigraphic reading" on a support –drawing or photograph – that permits the transmission of the observations performed in situ on the fabric. It is clear that any reading is in itself a filtration of reality, which means that, if analysis is a reading, we must at least seek a support to represent it as faithfully as possible to the reality of the fabric, in an attempt to attend to the greatest amount of information possible. Traditional drawing, as a realistic support, is incapable of describing all the characteristics necessary in the transcription of the stratigraphic survey, whereas a photograph reduces to a minimum the risk of reinterpretation or selection of information. In the same way a photogrammetric survey, even though it is very precise, only selects certain information, ignoring, for example, the colour of the most material features of the surfaces.

Nowadays as a basis of stratigraphic surveys "orthophotographs" are being used more and more; these are photographs manipulated by computer to combine the realistic representation of a photograph with the best possible metric approximation.

In the case of this study, we wished to achieve the reconstruction of the overall configuration of the building and the individualization of the surfaces corresponding to each of the transformation cycles. Each constructive or execution phase of the work leaves a series of signs, surfaces, structures, etc. as a consequence of the works carried out. Therefore at the end of the first "configuration" phase, which will leave the traces of the execution of the works, the building will assume the "configuration" resulting from the sum of all the actions and traces left in the execution of the works. After a certain lapse of time ("period") the building will undergo a second "constructive phase", which will result in new configurations and re-adaptation. The aim of this procedure consists of appraising a "crack system" taking into account possible historic repairs of cracks operated in the past which have not operated again as the original phenomenon disappeared. Through these applications we were able to verify that some mechanisms had been stopped some time before and that in view of the fact that there was no danger involved it was not necessary to perform repair works.

Conclusion

As we remarked at the beginning, the stratigraphic reading performed on the Villa Giusti-Puttini was part of a large survey whose main aim was to become familiar with the building in order to carry out restoration works afterwards. The collection of material data (the materials used, the elaboration, the constructive techniques, etc.) and the relationships established between them due to their capacity to record and show the importance and uniqueness of the signs left by individual actions take on a fundamental role when formulating a conscientious restoration project, made to respect and conserve that same material data and guarantee its continuity into the future. The common aim of the "stratigraphic analysis" and the restoration project must therefore be a study of the materiality of the building in order to achieve its conservation. Conservation of matter, transmissibility of the stratigraphic relationships and legibility of the restoration must be guarantees of a suitable type of project. It is not a matter of freezing the building but rather of conceiving the restoration as another phase in the stratification. It is a question of defining the forms of contact between what already exists and what is new in a way that respects the materials, the constructive