

The Representation of Architecture in Construction during the Hispanic Early-Modern Period

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Mankind seems to have an innate interest in processes that follow the nature and craft of creation. In the Judaeo-Christian tradition, the Book of Genesis prioritizes the process of the formation of the world rather than that created, thus providing an explanation of the cosmos through the course of its organization. Many aspects of human life have been influenced by the curiosity and interest raised by the creating process and, particularly, by the display of ingenuity and technique which demonstrates human capacity to overcome limitations imposed by nature, and demonstrating a guiding principle. In this regard, architecture in construction has become a paradigm that the figurative arts have been capable of representing to the point of creating archetypes of great symbolic value.

The representation of architecture in construction, frequently performed by artisans unrelated to the trades, has been seen as a reliable chronicle of the same. The study of this representation, subsequently, gains great importance in the analysis of the planning process and design representation systems, productive forms, techniques, materials, etc. throughout time (**fig.1**).



Figure 1. Hernando de Esturmio. Detail, “St. Catherine and St. Barbara”, 1555, Cathedral of Sevilla.

But it would not be until the mid-twentieth century that the studies on the medieval workshop drew scholars' attention because of this iconography, especially in France and Germany, leaving some gaps in the representation of other countries with more advanced/developed chronologies. The importance attached to the engraving as a diffuser of constructing models, started in the Early-Modern period, as is proved by the testimonies of a variety of artists, e.g. Juan de Arfe, who, in the latter quarter of the sixteenth century criticized those who copied Flemish and French engravings without any theory foundation. The study of painted architecture would be taken up again by Pierre Lavedan, midway through the twentieth century and, regarding Spanish sources, by authors like Juan Antonio Ramírez. Despite these facts, we believe that the representation of architecture during its constructive process has not been given serious consideration, even though it is "inherent" to the creative phase and, therefore, vital to an understanding of the final result, as well as having huge and specific semiotic possibilities.

THE STANDARDIZED KNOWLEDGE OF TREATISES

From the earliest times construction and technical issues have progressed not only in the formation of the workshop, but also among those theorists who attempted to expound similar written criteria, aware of their repercussions in the aesthetic domain. Marco Vitruvius, a Roman architect of the Augustan age, dedicated the second book of his treatise to materials, the tenth to machines and in the remaining volumes he interposed numerous recommendations with practical knowledge obtained on site, while calling upon the experience of Greek writers from earlier times. However, this was a difficult text and this delayed its translation, and illustrated editions to interpret the text did not appear until 1511. Moreover, the correct assimilation of the treatise was not even assured by translation and although Juan de Herrera complained about the poor versions in Spanish, no further attempts to offset this difficulty were made until the 18th century.

While from the Renaissance onwards Vitruvius was the basis of organized learning through his treatises and those he inspired, some of the construction information was gradually stripped from the edition, together with its visual interpretation. Alberti, in *De Re Aedificatoria*, followed the teachings of Vitruvius while offering his own critical viewpoint. To think out and materialize an idea through design, and to resolve this in material form were the aspects an architect was required to know about, but in their treatment Alberti did not systematically respond to these points. *De Re Aedificatoria* dealt with the selection of materials, but rejected the monographic analysis of devices followed by Vitruvius and again eliminated the possibility of representation.

Il Trattato do Architettura written between 1460 and 1464, appears to have bridged this gap. This work, which reached Spain from Ferrara in 1527, deals with social aspects, management and organizational matters, and tackles physical questions such as materials, tools, transport, etc. While prolific in detailing the intricacies of construction, the work is more a narration of the experiences and yearnings of an architect interspersed with biography, myth and utopia. However, in spite of the

wealth of subjects this treatise similarly fails to consider constructive issues as a form of training, going beyond that of trade apprenticeship. It is precisely in the points of greater complexity where the author is silent, and when he does venture to consider these points he does so without a systematic approach. The horizontal and vertical transport of material, considered to be one of the main problems, is tackled in a vague manner, resorting always to river transport and, in terms of hoists and in view of the complexity of any explanation, the master purely refers the student to the respective pages contained in the *Libro de Oro*, again without transcribing or illustrating the content of this enigmatic text.

The importance of the works of Vitruvius and Filarete in building matters is reflected by some of the images illustrating the same things and the editions of the former soon contained interpretations of the devices described. With regard to the work of Filarete, the various codices circulating illustrated this with building activities. Vitruvius and the early Renaissance essayists established a definition of architecture that included its execution and not just the final result. This was interpreted as such by Cesare Ripa who personified Architecture in his *Iconologia* (1593). However, the ensuing treatises from the Renaissance either followed in the wake of Vitruvius with all its limitations or, alternatively, focused on specific problems without attempting to offer total knowledge in building, as this was a learning which continued to be gained through the practice of a trade.

Architectural theorists of the Renaissance were reticent to deal with strictly technical aspects and this held true for one of the most pressing problems of construction, the transfer of loads. The majority of proposals were individual proposals that remained unpublished, as was the case of the manuscript *Architectura y Machinas* by Juan de Herrera on the workings of hoists, and which has been interpreted as an explanation of the operation of lifting devices simply to satisfy the monarch's curiosity (García 1986). Published works on machines only appeared at the end of the sixteenth century with the publication in 1588 of the work by Agosto Ramelli, followed in 1590 by that of Domenico Fontana and in 1595 by that of Fausto Veranzio. However, prior to this many paintings and engravings illustrated a wide spectrum of the most diverse building practices without publication.

ICONOGRAPHY OF ARCHITECTURE IN CONSTRUCTION

The appearance of architecture in construction in different themed representations is a constant in the history of art. Very often this appears merely as a background element to a main theme, but on occasions it appears as the main subject, illustrating the admiration and curiosity raised by the contemplation of the work. In this regard many images of religious themes containing building motifs may be found after the Middle Ages, and in the latter half of the fifteenth century these themes would gain greater circulation through engraving, while at the same time the building references appear in numerous allegorical and mythological representations. With the new times,

the subjects were transformed and the contextual element acquires such importance that the main subject becomes a mere pretext. In view of this fascination that is not reflected in other activities, one may then establish those themes which are most repeatedly represented and the intentions behind the same in order to give these a new meaning beyond simple graphic documentation.

Architecture in construction as a document

All work provides information as many of the stereotyped images implicitly reflect the circumstances, social reality and perceptions of their day (Baxandal 1972). However, from the Renaissance onwards many of these had a documental or evidentiary purpose, serving to indicate the precise state of a work to the promoter.

Although the representations coetaneous with buildings under construction are few in number, they become very significant. Throughout the 1660s the painter Anton Van den Wyngaerde was entrusted by Felipe II to portray numerous cities and palaces in the peninsular kingdoms. While the recording of urban layout and location in the surrounding territory served to diminish the partial view of the elements, this did not impede the precise drawing of certain buildings. In the view of the Valsaín Palace one may appreciate the introduction of Flemish style slate roofing in Hispanic territory together with the activities of woodcutters, workers in huts, carts, ladders and hoists. The view of the city of Cuenca shows the construction of the stone bridge together with a shelter where two stonemasons may be seen working the stone. In the majority of instances the reference to building activity is presented as something more distant. This is the case of the Jaen, Cordoba and Salamanca cathedrals portrayed with large hoists alongside as visible signs of their state of construction. These testimonies of construction activity should not be taken as free references of an activity, as is further corroborated by the absence of any trace of work in the Granada cathedral at a documented time of great activity. Other buildings reveal small acknowledgements of their real state such as the Tavera Hospital in Toledo and where one may observe materials and labourers preparing mortar on the site of the future church, and in the monasteries of San Jerónimo in Zamora and Santa Catalina in Talavera de la Reina where hoisting devices may be observed.

However, the paradigm of the image of construction in Hispanic lands is, undoubtedly, that of the Hatfield House (**fig.2**) drawing showing the building of the El Escorial monastery. The drawing dated around 1576 and by an unknown artist, though probably related to the Flemish school, has been classified as an image representing the synchrony and order in the vast collective undertaking demanded by architecture (Navascués 1984). The representation of the construction process of real contemporary architecture tended to be subject to the fidelity of that observed and when this portrayal did not occur it was not to magnify the activity but, instead, to ignore it and ensure that it did not disturb the view of the architectonic lines. However, this drawing is testimony to pride of work and corresponds to a precise reality described by the chroniclers of the Jeromian order and where one may appreciate the same affection for detail as employed in the same period to illustrate

net fishing or the assault and defence of a stronghold, these being other activities which also required collective effort.

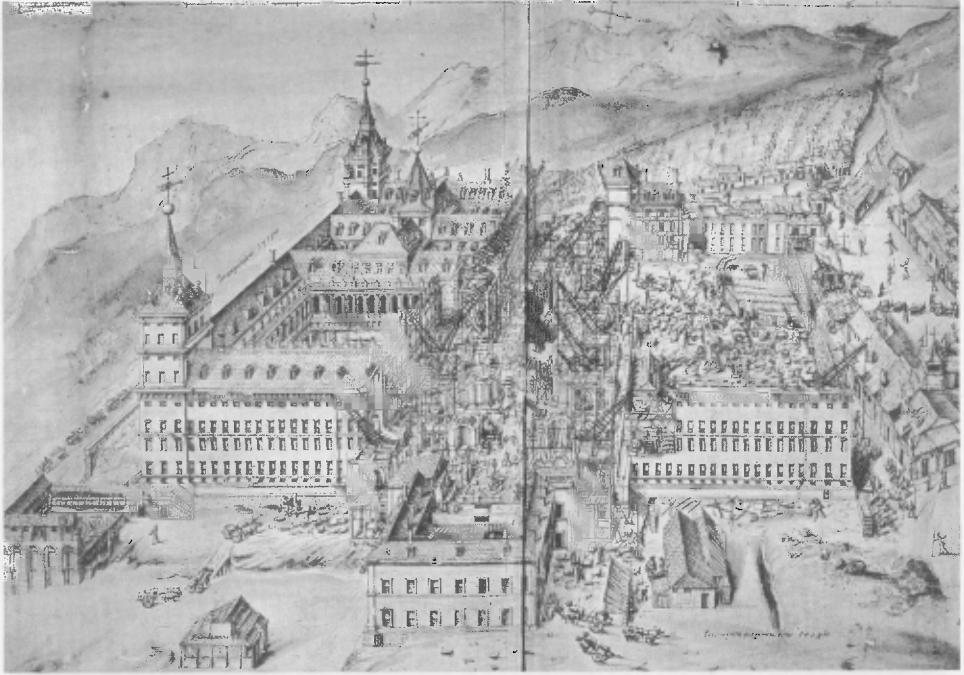


Figure 2. Anonymous artist. El Escorial in construction. c.1576. Hatfield House, Collection of Lord Salisbury.

The oil painting by Antonio Ramírez Montufar provides a precise interpretation of the building of the Guatemala cathedral in Santiago de los Caballeros in 1679 (fig.3). The painting, conceived as one of the great canvases “of map and plan of the entire work”, reveals its primary objective as a true to life representation of everything surrounding the building two years prior to its completion. Undertaken under commission by the Council of the Indias and New Spain, this descriptive work supplemented the many reports and petitions known by the authorities regarding these works. This descriptive work shows the architect taking measurements on the drum, musicians setting the rhythm of the works and the Spanish, Indian or Creole workers, distinguished by their clothing, in a picturesque image of a large-scale construction, legitimized by the civil authorities contemplating the building from the Government seat (Amerlinck de Corsi 1981).

Architecture in construction as an iconographic device

Ever since the Middle Ages, the building process has been associated with scenes of biblical architecture, such as the construction of Noah’s Ark, the Tower of Babel and the Temple

constructed according to the orders dictated by God to Solomon to hagiographic scenes taken from the *Golden Legend* by Jacobus de Voragine, to the representations of the *Speculum Humanae Salvationis* and the foundation of churches and monasteries (fig.4). As from the second half of the fifteenth century these subjects would gain greater circulation through engravings and building references would appear in mythological collections such as the representation of Larunda, the tale of Apollo and Neptune building the walls of Troy, the legend of Romulus and Remus, that of Didon of Carthage, that of the fairy Melusina who built numerous castles and churches overnight, and allegorical representations such as the Seven Wonders of the World, the Seven Virtues, the Four Great Powers etc.

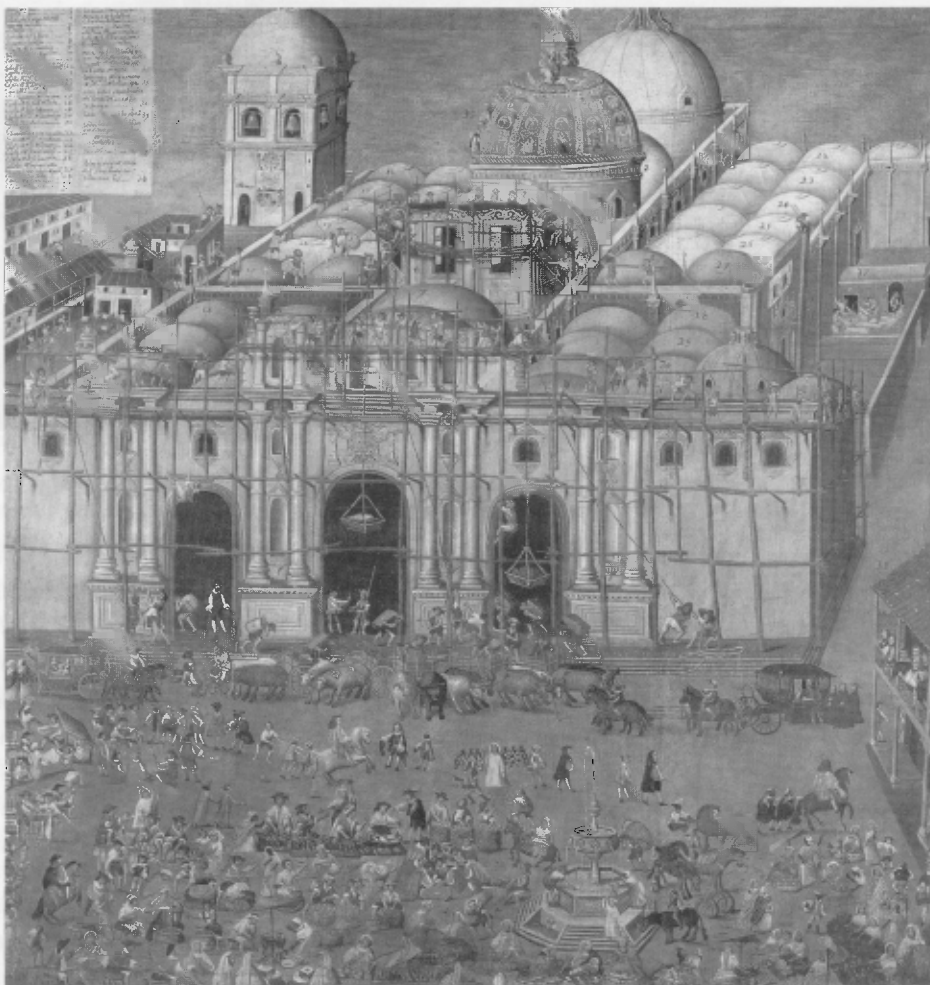


Figure 3. Antonio Ramírez Montufar. Construction of the cathedral of Guatemala. 1679. Galerías La Granja, S.A., Ciudad de México.



Figure 4. Circle of the master of Avila. Construction of a church dedicated to Saint Michael, c.1475-1555 Cathedral of Ávila.

The subject matter related to biblical architecture stand out among those listed above. In the majority of cases these reveal broad knowledge of construction techniques and the architectural and engineering treatises of the day, while continually repeating a series of topics: The patron visiting the works, and the progressively more frequent appearance of the architect by his side in intimate conversation, and, on occasion, showing him the plans as proof of the correct course of the work and the exact reproduction of the specifications; the carpenters preparing the way for the stonemasons and masons by the construction of props, scaffolding and hoists; the framework, flooring and roofing; the quarry workers extracting material from nearby quarries; stonecutters working the stone in the open air or under shelter, workers sieving or mixing sand and lime; the smoke emerging from brick kilns and foundries for the making and repair of tools; men and beasts transporting materials to the work site; the workers and machines raising materials up the scaffolding where they are stacked by masons and apprentices. Many are the promoters of this staging but the most important regarding quality and quantity are those which hail from the north and centre of Europe, because of their ability to create a whole new pictorial genre of diverse, alternative and sometimes complementary vision. Interpretations of the myth of the tower of Babel

have been made as a metaphor of the decadence of the Roman Church, the fall of the Roman Empire, the city and vanity, but also to organized knowledge and the capacity of human ingenuity to control nature.

In all reality the message could be very diverse as well as the manner in which to represent this. In this regard the most evident transformation is provided by a change in style and culture. The interest for construction in figurative art arises from the technical revolution undergone by architecture in the second half of the twelfth century in France. However medieval aesthetics, with its emphasis on the iconic and symbolic rather than naturalist representation, was stripped of all details of the construction process in order to interpret the image as a simple illusion to the construction by a series of iconographic conventionalisms. This was enough to portray the innovations incorporated in the forms of enclosure, spanned openings or the raising of interiors. These representations compare human activity and the devices employed with the work itself, which was not seen as work in progress that was presented in the form of a practically completed work, frequently in the style reigning at the time of construction. This is explained by the influence of an ontological aesthetic, which associated beauty with fullness and formal perfection, while showing disdain for the fragmentary, ruined or unfinished which, in the words of St. Thomas Aquinas (*Summa Theologiae*, First Part), was interpreted as an evident lack of harmony between the parts and, subsequently, as something ugly and without illumination (Forero-Mendoza 2002).

The Early-Modern period, without entirely abandoning the codifying of architecture in construction through certain traits that tended to remain invariable for the purposes of precise iconographic meaning, witnessed important changes in the representation of this matter, such as a greater naturalism in representations. It benefited as well from the efforts to interpret in image form architectural treatises such as those of Vitruvius, and the architecture described in the Scriptures, such as the Temple of Solomon. Finally, the preoccupation for material Antiquity converted the ruin into an area of experiment and study of construction. In this regard, the monumental remains are possible contextual elements, serving as allegories of the collapse of classical pagan culture and the triumph of Christianity, and formal teaching, but also of the construction techniques and, subsequently, a source of inspiration to reflect on the building process. The ruin and construction shared the appreciation for the fragmentation and section of architecture in all its tectonic splendour, and converged the spectator's interaction with that observed: in the first one imagines what was, while in the second, what would be. In this regard the similarities between many of the representations of the Tower of Babel and antiquities such as the Roman Coliseum are eloquent and refer more to collapse or deterioration than the logic of construction, as they show a cut-off point to demonstrate the underlying arrangement. This idea also took on great importance in the Renaissance where the section was introduced as a graphically represented projection system. Following its introduction by Rafael de Sanzio the sections of a building would become ever more frequent and reveal the workings of the structure in a manner which was something more than simple archaeological affection. In this way the representation of architecture in construction during

the Early-Modern Age was no longer just one more iconographic subject but, instead, a form of criticism and a means of propagating the same.

INTENTIONS OF REPRESENTATION

There is wide-ranging and coherent information on construction in those representations where the activity is an attribute, which helps identify the represented subject matter. This may correspond to long distant or even mythical moments, but the anachronism in the placement of the scene perfectly corresponds to the recording criteria of the day. In order to obtain a clearly objective and documentary meaning from these images it is necessary to take on the mindset of those who created them, and it is necessary to study the chronicler prior to examining the events narrated by the same as what we see is no more than a painted opinion, which we frequently, and erroneously, wish to consider as real (Burke 2001, p. 22; 2002, pp. 1-10). It would therefore be a serious error to attribute documentary characteristics to images that were not made with this intention. Even in those cases where we may confirm that such an objective existed, it is first necessary to investigate the true reasons behind their creation when considering the pre-disposition which may have, consciously, been incorporated in the image. The artist constructs the scene with snippets of work experience, but in a bi-dimensional world without rejecting the weight of iconographic tradition. It is subsequently necessary to consider the ultimate meaning of the building itself over and above the subjects of works representing building scenes. Some of these shades of meaning are considered below.

The participation of the clergy in building works is common in medieval iconography as an allegory of the construction of the Church. The monks themselves frequently appear in the capitals in order to demonstrate a certain authority over the project (**fig.5**). The participation of holy figures or divine intervention in the construction process was frequently employed to legitimize and bless the architecture. In this regard the divinity was associated with the selection of sites for future buildings and some of the saints appear laying the first stone in a building, collaborating in the building works or intervening in the case of accident. These components disappeared with time and were replaced by others, like the exaltation of the figure of the architect and the patron in these projects. Ever since the Renaissance the importance of the architect was magnified by the attributes of design, such as plans, while the patron remains as the personification of power and the true mentor behind the project. On occasions this is represented as an artifice for the interpretation of the work, as in the case of King Solomon, who transformed a design inspired by God, and similar attempts are made to portray other monarchs in the same light before their works.

Political treatises have traditionally considered a governor's concern for architecture as one of their main qualities. This occurs in the work *Política para corregidores* (1597) by Castillo de Bobadilla, which considered the conservation of monuments as a means of glorifying the city and its promoters and which defended the care of public buildings to such a degree that it would condemn

any person who started a new work without first restoring or finishing those already started. The portraits of monarchs, together with the allegories referring to the Four Great Powers, share these criteria and here it is common to observe constructions in the background to associate the monarch with their concern for architecture and to show the decisive role of patronage and building of works as an evident instrument of power. Many of these aspects may be seen in the “Construction of El Escorial”, painted by Luca Giordano around 1695, where the construction is clearly portrayed in the distance, but without encroaching upon the foreground. The latter is occupied by the figure of the monarch, who is seen reviewing the plans and enquiring about the work in the presence of the architects Juan Bautista Toledo and Juan de Herrera, together with Friar Antonio de Villacastin, a Jeromian monk, thus testifying to the participation of monks in the works though, in this case, at an administrative and intellectual level.



Figure 5. Convent of Santa María la Real de Nieva (Segovia), before 1432.

The patron has an interest in the architectural work and in the ensuing image of this and his patronage. When representing these factors the artist frequently resorted to architectural forms and backgrounds taken from classical or biblical antiquity or to the architecture of the day set within scenes from this period in order to establish a clear connection between the project and the past thus aiding the simile sought. In this regard biblical references tended to receive two sources of influence as their depiction was based on the building reality of the present, which proffered increased naturalism and verisimilitude, while at the same time benefiting from the legitimacy conferred by the biblical subjects which related these contemporary works to the divinity and supreme perfection. This latter is a resource employed by large contracting companies who through allusion to biblical architecture seek the legitimization of the use of materials described in the holy text, in the specified

measures, or in the formal aspect finally achieved (Ramírez et al. 1990). The clear comparison of the architecture designed for El Escorial with that revealed in the interior of representations of the Tower of Babel (fig.6), and the Temple of Solomon, only serves to underline this aspect in an attempt to establish a clear correspondence between Felipe II and the biblical King Solomon. While explicitly differentiating both models, there are evident parallels in the system of orders and work to further demonstrate the precise link between the Escorial project and the knowledge and virtue of Jerusalem.



Figure 6. Pellegrino Tibaldi. Construction of the Tower of Babel, 1590-92. El Escorial.

Some authors consider certain representations of the organization of a work to be a metaphysical representation of the Vitruvian cycle of construction and supply and transport of materials, while others have interpreted these as allegories of the creation of perfect cities in rural areas, evoking the selection of location and its urbanization (Weil 1994, p. 479). Yet more scholars consider the desire to evoke royal constructions as examples of the establishment of historical or cultural projects. The xylograph included in the upper part of the frontispiece of the book of Pedro Antonio Beuter, titled, *Primera parte de la Cronica General de toda España...etc.* (1546), which represents the construction of the Christian wall in the times of Pedro V, may be interpreted under this premise.

One way or another we may then conclude that the majority of representations reveal an admiration for the process itself, to the point where contextual matter becomes the clear protagonist and where they may be seen as true visual encyclopaedias of construction to the detriment of the subject justifying the same. This occurs, for example, in the Tower of Babel, where the negative qualities of pride and vanity transmitted by the book of Genesis are converted into a veritable admiration for organized knowledge and collective effort allowing the taming of nature. This may be deduced by the improved predication acquired by the landscape as a result of the construction process and the visit of Nemrod, prior to the result of their actions, namely, the confusion of tongues as punishment. The detail and profusion of construction themes practically forms a specific genre where the construction of monuments is entirely seen as a spectacle.

THE CONSTRUCTION PROCESS AS SPECTACLE AND FESTIVITY

We have indicated that the manuscript on machines written by Juan de Herrera was probably drafted with the aim of satisfying the curiosity of a monarch avid for learning. This entailed constant and organized visits to the work. In 1588 during the work on El Escorial, the masonry surveyor Mijares revealed a device, in the presence of the king and two princesses, which was of such ingenuity and counterweight that it was capable of raising four large sculptures of kings of the Old Testament onto the façade of the church. This interest continued as, in the words of the royal chronicler Luis Cabrera de Cordoba, the Escorial site was such a spectacle that it frequently attracted onlookers including the king himself, because the view was more admirable when under construction than when the building was complete (Book XI, p. 917). As can be gleaned from the chronicles there may have been an intention to publish the manuscripts dealing with the construction of the building complex, including the drawings, such as those contained in the collection of Lord Salisbury - an intention that paralleled the publicity project celebrating Domenico Fontana's engineering feat in raising the obelisk in St Peter's Square, recorded in a sumptuous publication (1590).

This admiration explains the propensity to evoke building activity in the most diverse activities. After the Middle Ages the world of festivities adopted the iconography of construction either as a symbol of power or knowledge, or just as one of pure entertainment. The sacramental representations in the Corpus Christi processions, the triumphant entry of monarchs or the celebrations of royal anniversaries, weddings or births, the cortèges accompanying the inauguration of a new church, the canonization or commemoration of saints, etc., appropriated this ephemeral iconography, rich in religious and mythological references that also incorporated architecture in its construction stage as a central theme, taking the latter as the teaching of God, as a sign of power or as an element of group exaltation, etc., but in all cases as an element of surprise.

Elaborate artifices were employed on the popular medieval stage. These were incorporated as a result of the continuous flow of devices proceeding from different trades and served to enhance this type of stage machinery. Many devices were adapted from those employed for the vertical and horizontal transport of loads and were employed in spectacles dedicated to the glorification of the monarch. The most eloquent example, documented from the start of the fifteenth century, is that of the descent of children, dressed as angels, from the top of the city gates in order to present the monarch the keys to the city and demonstrate the gratitude of the town's inhabitants. The image of a cloud or perch as a platform from which these boy angels would descend were simply transformations of the machines built in wood and paper to represent the descent in the highly successful Assumption dramas held inside churches. The incorporation of classicist forms in the construction of this complex stage machinery at the end of the fifteenth century led to the redecoration of these artifices in a manner evoking the past and by replacing, for example, the platform by one in the form of a triumphal carriage (Falomir 1993).

From the Renaissance onwards the literature on festivities provided a good account of all this and were to become a new literary genre which proliferated in Europe during the sixteenth century, reaching Spanish territory towards the end of the century and thriving throughout the next century. These books provide chronicles of the festivities held in different courts and cities and are of interest on account of the narration of the construction processes carried out for the celebration of significant events. The text and images illustrating these books refer to the large artifices which were moved around the city and which temporarily conferred a new appearance to the town. In the royal entrances, for example, it was common for the guild representatives to pass through the city gates with their working tools as a symbol of homage. In the case of the building trades this factor took on particular importance as it symbolized the collective contribution to the transformation of the town.

The tradesmen and particularly the masons, stonecutters and carpenters built large carriages and floats decorated in images reflecting their professional activity. In some cases much ingenuity was displayed in projecting images of buildings under construction. On occasions these were made in the form of life-like floats which reflected the arrangements made for the festivities throughout the city. While many examples abound in both Spain and Latin America, we shall refer to three specific cases found in the city of Valencia. During the festivities of 1638, commemorating the fourth centenary of the city's conquest, a hoist was employed to raise and lower a bronze equestrian statue of Saint Martin from its niche in the façade to an altar. In 1659, on the occasion of the canonization of the Archbishop Tomas de Villanueva, and in 1662, by decree of Alexander VII in honour of the Immaculate Conception, monumental architectural structures were incorporated in the carts, referring to the trades that have participated in their construction (fig.7). In the latter case the masons included clear references to the reconstruction of the Temple of Solomon after the profanation of Antioch Epiphanes, with ostentation of their activity in a work completed and interpreted from the Baroque perspective. The ornamentation includes various odes in Valencian comparing the Virgin to a city with architectural elements, such as foundations, door, column, capital, tower and stair, as well implements of the trade, such as the angle or the plumb line.

However, it is perhaps the traditional folkloric element incorporated in these festivities that best represents the convergence of construction with popular spontaneity. The Corpus processions, which were both the originators and the benchmark for this type of cortège, incorporated a programme directly dictated by the authorities from the seventeenth century while at the same time enjoying total freedom of expression in the dances and pantomimes performed by the townsfolk. These festivals are possibly what best represent the mood of the age and the desire to represent everything, while converting the admiration and appreciation for daring architectural constructions in masquerades and dances to open the processions.

The main attraction of the performances was the construction, after a ritual dance, of a castle or human towers, both being eminently architectonic terms, which demonstrated a clear domination of

the technique and distribution of loads. The oldest conserved reference of such a processional dance dates back to 1633, and where after pirouettes and other figures, the performers ended up forming a bell shape by standing on each other's shoulders until one man is left atop. On the occasion of a visit to Tarragona by Felipe IV and María Isabel de Borbón, the local procession was amplified by including many performers from other areas to offer the monarchs a varied spectacle. In Madrid, an illustration in tempera shows the Corpus festivities of 1672, where one may observe a human tower or "castle" performing on top of the diabolical dragon of "Tarasca" (fig.8), as a symbol of sin, and which opened the festive cortège of the Corpus procession. The spectacular nature of these dances, which also exist in North Africa, South America and Central Europe, soon aroused admiration and it was not long before they served to open ceremonies such as the laying of the first stone of the new cathedral at Lerida in 1762. This factor strengthens the relation between these dances and architecture in construction as corroborated by the participation of numerous building trade apprentices in these performances.

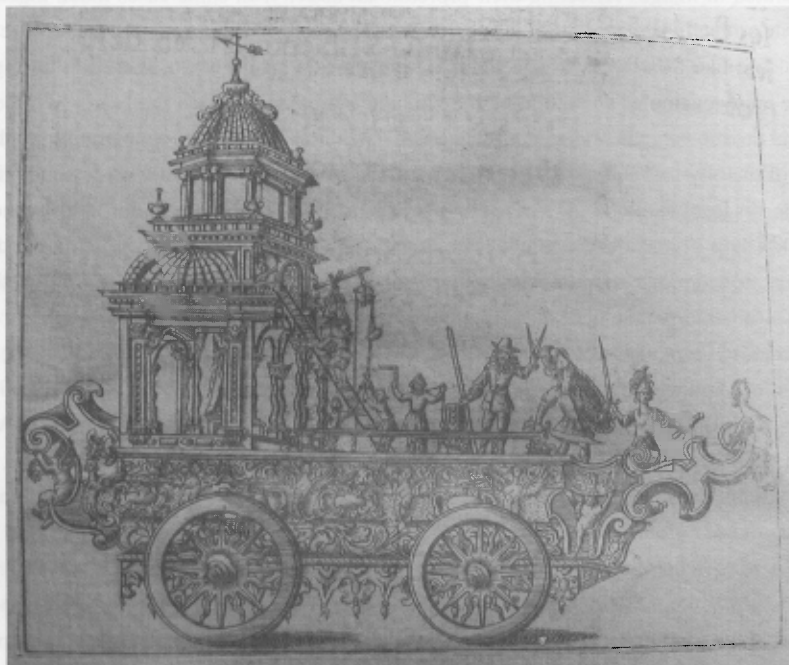


Figure 7. Cart of the masons. Festival of the Immaculate Conception celebrated in Valencia in 1662.

All these activities demonstrate the interest raised by the construction process and the popular interpretation of the same remains perfectly relevant today. Media coverage still emphasise constructional acts such as the laying of the first stone or a technical solution of one aspect particularly relevant to a building. Antonio Gaudi's Sagrada Familia Cathedral in Barcelona has been under construction since 1918, and it is still one of the most visited monuments in Spain. Here

we come up against the curiosity raised by construction itself - one further illustrated, in the same city, by the film "Under Construction" by Jose Luis Guerin, which showed the building of a housing block in the historic centre of the city.



Figure 8. Leonardo Alegre. "Tarasca" of 1672 in Madrid.

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INTRODUCTION

During the Illumination period, under the reigns of Fernando VI and Carlos III, road communications within Spain were very poor. To counteract this enormous backwardness and trying to solve this serious problem, a project was planned to connect the cities of Zamora, Valladolid, Palencia and Segovia through several canals which, once they were linked, would ensure the easy transport of wheat to Madrid and the Castilian coast. They traced a route through the Guadarrama mountains as well as a route linking Rebollos to Alar del Rey at the head of the Canal of Castilla course, but only the latter was constructed.

THE CANAL OF CASTILLA

The building of the canal began in 1753. It is a 207-kms long watercourse which winds its way through the provinces of Palencia, Burgos and Valladolid in the heart of the Castilla - León plateau, an arid region of continental climate where construction is traditionally made of earth to mitigate temperature changes and avoid the use of wood which is in short supply. The canal was intended to improve communications and transport within the area, as the north, south and east range of mountains encompassing the cereal producing central plain prevented wheat export. They will very soon think about using the canal to irrigate the contiguous land which was very rich with water supply. Construction began in Calabera de Rivas underneath the fifteenth century Franciscan monastery where bellry was taken as a point of reference. Just a short time after, small overflows (auxiliary canals whose volume of water or flow was used to move industrial mechanisms) were included in the locks to make its industrial use possible. After Francisco Sabatini's inspiration in 1755, they began to build a very small type of water mill with only three millstones, a prototype repeated, with hardly any variations, along the Canal.

Jevellinos, who visited the building works for the first time in 1791, said this was the beginning of further industrialization and he could already see 71 industrial buildings between the seventh and the 21st locks. Juan de Hozar, the last great project director drew 23 industrial buildings along the 24 locks of the *Rama del Norte* (north branch) in 1806. Most of them were constructed of *tapia* (rammed earth) and *adobe* (mud bricks made with earth, straw and water, usually dried in the sun and not even baked). Both, using earth from the excavation itself and using techniques local people