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New Architectural Models and Building Tradition: A Dialogue in Early Modern Sardinia – The Jesuit Church in Sassari

Emanuela Garofalo

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New Architectural Models and Building Tradition: A Dialogue in Early Modern Sardinia – The Jesuit Church in Sassari

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Architecture in early modern Sardinia is characterized by a strong continuity with previous practices. In the second half of the 16th century, new models join the Gothic building tradition, linked in particular to trends in military engineering and Classicism of the Catholic Counter-Reformation. The Jesuit church in Sassari offers an interesting example of the intertwining of these architectural modes, which originated with a sudden change of leadership at the site. Giovan Maria Bernardoni, an Italian Jesuit architect, initially modeled the church after the Gesù in Rome, and it was partially built under his direction. After his departure from Sardinia, local master builders finished the construction, following the Gothic tradition and possibly some external influences. This article analyzes the church, particularly focusing on the challenges presented by its articulated vaulting system completed between 1587 and 1609.

Keywords early modern architecture, building tradition, rib-vault, stone dome, Jesuit church, Sardinia

1. INTRODUCTION

As happens in the other major islands of the western Mediterranean (especially in Mallorca, but in many respects also in Sicily and Malta), in the first decades of early modern age the architecture in Sardinia shows strong continuity with the wealth of experience developed in previous centuries. This effect occurs especially between the 14th and 15th centuries, within the Aragonese-Catalan architectural culture, involving territories politically linked by common loyalty to the Crown of Aragon (Alvaro Zamora and Ibáñez Fernández 2009). The persistence of proven building tradition and of the extended success of some spatial and formal solutions, however, have generated the historiographical misunderstanding of general immobility and cultural isolation, which keener analyses have in many respects already corrected (Sari 2003; Nobile 2011). For example, the widespread use during the sixteenth century of rib vaults in church construction, as well as a matter of taste, could be also a decision inspired by prudence. The already proven structural reliability of such vaulting systems and the possession of the relating know-how could appear, in fact, more reassuring for both the master builders and their clients (Nobile 2011). Additionally, the role played by the guilds of building professionals documented in Sardinia from the end of 15th century for the permanence of technical and formal solutions cannot be ignored (Garofalo 2010).

This permanence is not at all uncommon in the European context, but it has a particular relevance—from a historiographical point of view—in a cultural context such as that of Sardinia, an island "between Italy and Spain". Despite models from the Italian Renaissance having reached Sardinia in the first half of 16th century, as noted in painting and sculpture, until the second half of the same century their influence in architecture is very reduced (Sari 1992). On the contrary, architecture in the same period testifies to a strong connection with new techniques carried out in some regions of the Iberian peninsula (especially Valencia) within the field of Late Gothic architectural culture. Q2

The existence of a strong continuity in 16th-century architecture in Sardinia, in fact, does not imply a total impermeability to new methods and solutions. It demonstrates, however, a significant receptivity to external contributions, especially those linked to the arrival of several waves of master builders and architects on the island (Nobile 2012).

Undoubtedly that of religious architecture is the best field to observe the intertwining of well-known solutions and new models. In the panorama of the churches built in Sardinia between the fourteenth and sixteenth centuries, the most relevant factor is the extraordinary diffusion of a specific type, quite common within the "Mediterranean Gothic," (Mira and Zaragoza Catalán 2013), that of a single nave flanked by chapels between buttresses.

In this apparent uniformity it is possible to discern a variety of interpretations on this theme, mainly concerning the delicate

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FIG. 1. Diaphragm arches and wooden ceilings in the church of San Francesco in Iglesias (photo by author).

FIG. 2. Sequence of vaults with five keystone on the nave in the church of S. Eulalia in Cagliari (photo by author).

issue of the roofing system. Solutions in use range from a system of diaphragm arches and wooden ceilings (Figure 1) to sequences of stone vaults interspersed with transverse arches, or from simple rib vaults to those with five or nine keystones (Figure 2). The extrados of these vaulting systems is frequently covered only by a layer of mortar with small fragments of brick (*cocciopesto*), without a wooden roof above. With regard to the spatial arrangement, the adaptation of an imported model can be noted: a solution with a straight ending in which a quadrangular space opens, lower than the nave, which functions as a presbytery (Segni Pulvirenti and Sari 1994). However, as a result of external collaboration, alternative options exist, including the insertion of the transept.

In the first half of the 16th century a renewal of Gothic architectural repertoire takes place, probably due to the arrival of a new wave of master builders coming from the region of Valencia (Nobile 2012). In the second half of the same century, especially from the 1570s onward, the presence of military engineers in the service of the Spanish Crown and that of the Society of Jesus drove a further renewal process (Sari 1992; Segni Pulvirenti and Sari 1994), introducing a Classicist aesthetic and new structural elements, for example, barrel vaults and Classic domes, as well as a new interest in central-plan spaces. The most complete example is the church of S. Agostino in Cagliari (Figure 3), built between 1577 and 1580 under the direction of Giorgio Palearo Fratino and probably designed in 1576 by his brother Jacopo, both military engineers (Sari 1992; Segni Pulvirenti and Sari 1994). This church, as well as the destroyed church of Carmine also in Cagliari (circa 1580), and a few other examples reflect the Renaissance building tradition. More often innovative techniques from abroad generate interesting hybridizations, which combine new models and established practices, such as the rib vaulting systems. A clear example of this combination is provided by the following case study: the Jesuit church in Sassari.

2. BUILDING THE JESUIT CHURCH IN SASSARI, BETWEEN INNOVATION AND TRADITION

2.1. The Story of the Building and its Actors

After a period of initial settlement on the island, from the 1560s the Society of Jesus undertook a demanding campaign

FIG. 3. View of the interior of the church of S. Agostino in Cagliari (photo by Federico Giammusso). © [rightsholder]. Reproduced by permission of [rightsholder]. Permission to reuse must be obtained from the rightsholder.

of new foundations in Sardinia starting with the monumental church of Jesus and Mary in Sassari, now Santa Caterina (Monti 1915; Aramu 1939; Turtas 2010; Garofalo 2012). The documents kept at the *Archivum Romanum Societatis Iesu* (ARSI) enabled the reconstruction of the main stages of building, which proceeded slowly due to technical and economic difficulties.

The foundation started in December 1578, according to the design of the Jesuit architect Giovan Maria Bernardoni, who was born in a small town in Lombardy (possibly Laino or Cagno in Brianza). After training as master mason, Bernardoni was accepted as *coadiutore temporale* to the Society of Jesus in 1564 (Pirri 1955; Kowalczyk 1999). From 1564 to 1571, Bernardoni completed his training in Rome, participating in the construction of the Gesù church as a pupil of the well-known Jesuit architect Giovanni Tristano. In Rome, he also came into the circle of mathematician Cristoforo Clavio and possibly with the famous architect, Jacopo Barozzi da Vignola (Salviucci Insolera 1999). During this period he was also asked to intervene at other building sites of the Society in Milan, Florence, and Civita S. Angelo; he then continued his working as an architect in Naples from 1573 to 1578 (Pirri 1955). So, when he reached Sardinia he was already an experienced architect with a strong Classical vocabulary.

Bernardoni's design for Sassari was revised and corrected in Rome, according to the requirements of the Society regarding new foundations (Turtas 1986). The author of the review was probably the architect Giovanni De Rosis, at the time *consiliarius aedificiorum* at the Rome headquarters (Pirri 1955). From the exchange of letters among Bernardoni, the Provincial Father, and the General Father of the Society, Mercuriano, only minor corrections to the original design can be discerned. For example, in a letter written by Bernardoni to Mercuriano, on July 29, 1579, only the dimension of the chapels was changed, and it is clear that construction of the church was already begun. Even so, Bernardoni expressed his disappointment, a reaction possibly explained by a professional rivalry (Garofalo 2012):

> Li giorni pasati scrise doi letere a V. R. paternità sopra quello che me ànno mutato della chiesa e collegio di qua di Sasar. Ma perché credo che non v'erano tanto pretesto, ò scrito a m° Lorenzo più in particolare, . . . perché quello che m'ano mandato non mi piace e non po star bene, perché le capele sono tropo grande. . . . che me mandino presto la risposta a ciò posiamo proseguire la fabrica incominciata, la quale da admiratione a tuto Saseri. (ARSI, Sardinia 15, f. 219; Pirri 1955, p. 260).

As already noted by Father Pirri, Bernardoni strangely sent his design for Sassari, together with an explanatory report, to Lorenzo Tristano, the brother of Giovanni Tristano, rather than to Giovanni De Rosis, *consiliarius aedificiorum*, in charge of controlling all the designs for the buildings of the Society (Pirri 1955). After the correction was made to his design, Bernardoni never wrote to De Rosis, leading one to wonder whether acrimony existed between the two architects.

Evidence of Bernardoni's proud spirit may be traced in a letter to Mercuriano, sent from Sassari on March 11, 1579, in which Bernardoni proudly claims to have the same reputation in Sardinia as that of Vignola in Rome (ARSI, Fondo Gesuitico 1590/II, F. 472 r; Garofalo 2012). Moreover, some years later in 1584 at Lublin, he had an argument with the rector of the local Jesuit college, who asked him to work as master builder;

as the architect, Bernardoni refused to carry out manual labor (Paszenda 1999).

The words of the Vice-Provincial Father Brno make it clear that only minor corrections were made to Bernardoni's design. On July 29, 1579, he wrote to the General Father that, even if they were still waiting for an answer to Bernardoni's counter remarks, the construction of the church could continue, considering the little difference (*la differenzia es poca*) between the original design and the one sent from Rome (ARSI, Sardiniae 15, f. 249 r; Garofalo 2012 152). Indeed, between 1579 and 1587 the construction of the church proceeded, reaching the level of the interior cornice. The building site was directed by Bernardoni himself only until 1583, however, due to his transfer to the Polish Province of the Society.

From a letter to the General Father by Giovanni Franch, the Society's buildings administrator in Sardinia, it is known that by November 1585 the church had reached the height of 22 *palmi* (perhaps Roman *palmi*, or approximately 5.50 m) on one side and of 12 m on the other. Franch also wrote that in 1 year they could start a more difficult phase, the construction of the vaults, for which he asked a good master be sent from Rome:

> handa dicha fabrica adelante, y confio en nostro siñor que de oy en un anyo, de tres partes della estaran las dos hasta ala boveda arriba porque una ladera esta ya a biente y dos palmos alta y la otra a doze, y supplicaremos todo este collegio a V. P. de oy en un año si el siñor me da vida, que nos haga charidad de embiar un maestro de essos paraque no se irre lo de la buelta o, boveda que es lo de mas primor y dificultad. (ARSI, Sardinia 15, f. 330v; Turtas 1986, p. 61)

Although help did not arrive from Rome, the construction of the vaults finally began in 1587. The first "experiment," carried out by the Jesuit Brother masons, was unsatisfactory and contributed to increasing concerns regarding the vaulting system's completion, as Franch explains in another letter:

> porque para este año se comencaria a cubrir una pieca que puede servir de capilla, tiene 34 palmos de alto, yo supplique a V. P. que para esta obra, digo para las bovedas, sesia menester mas arte de la que tienen estos hermanos, para paredes como van a plomo es mas facil y hasta hora estamos contentos y segun el juyzio de los mejores maestros de la tierra: y esta boveda de cruzero que han acabado haora para s. Joan la han echo con grande trabajo y cierto no a sallido con tanta perfection como yo deseava: [. . .] y es templo tan principal que se haga como se deve y assi para las bovedas mayores que vernan de aqui a medio año o mas que por amor del siñor V. P. nos haga esta tan grande gratia y charidad que yo serre contento de participar en el viatico del maestro que V. P. embiare: como digo estos otros meses iran . . . hasta al cordon de donde comensaran las bovedas mas altas y muy mayores. Los maestros que podrian ayudar a los hermanos nostros los tiene su Majestad occupados en tantas obras que haze de fortificacion de este Reyno. (ARSI, Sardinia 16, ff. 102r-v; Turtas 1986, p. 62)

Unfortunately the documents do not give additional information about what happened to the masters involved in the construction of the vaulting system, brought to completion by 1609, the year of the solemn inauguration of the church (Turtas 1986).

The plan chosen is most usual for a Jesuit church: a single nave flanked by three chapels on each side with a wide transept and straight presbytery (Figure 4). This planimetric solution, with the exception of the transept, is consistent with a model most commonly employed by the religious architecture of Sardinia, adopted on the island at least two centuries prior, as previously mentioned. The structural and spatial analogies between the two types, moreover, have been the subject of a long historiographical debate focused on their origins and the possible derivation of the first one from the other (Mâle 1926; Lavedan 1974).

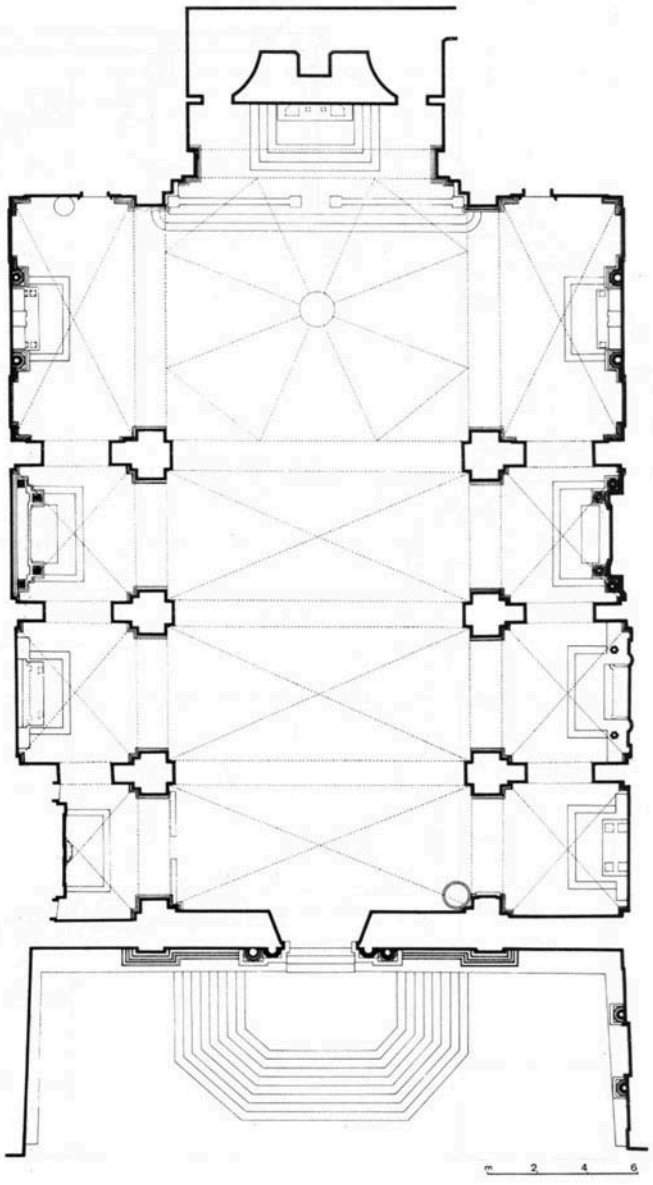

FIG. 4. Plan of the Jesuit church in Sassari (from Mossa, V. 1965). © [rightsholder]. Reproduced by permission of [rightsholder]. Permission to reuse must be obtained from the rightsholder.

The study of Sassari demonstrates a significant example of the intertwining of the two models, or, rather, of their interference with one another (Figure 5). In fact, from the floor to the cornice, the church imitates on a simplified scale the typological model provided by the Gesù in Rome. In this part of the building a rigorous Classical vocabulary was adopted, similar to that of the Escorial, in accordance to the artistic policy carried out by Philip II, also in Sardinia (Maltese 1966). It was only his successor, Philip III, who officially assisted in the financing of the work in 1599—at the very beginning of his reign—by granting tax exemptions for the considerable sum of 1,000 ducats for its completion (Turta 1986).

Above the cornice, ribbed vaults, large transversal pointed arches and some motifs in the decoration belong instead to the Gothic building culture, that in Sardinia has one of its Mediterranean strongholds. The combination of the two systems, in this case, is the result of necessity, and provides further evidence of the flexibility on the part of the Society of Jesus to adapt the Roman model to local solutions and building traditions in the construction of its churches. In the delicate phase involving the construction of the roofing system, the building site could only rely on the forces locally available. Having been deprived of the guidance of Bernardoni and having had requests to send another architect from Rome repeatedly disregarded; these forces consisted of: confreres, disciples of Bernardoni, military engineers in the service of the King of Spain, and master builders trained in the Gothic tradition.

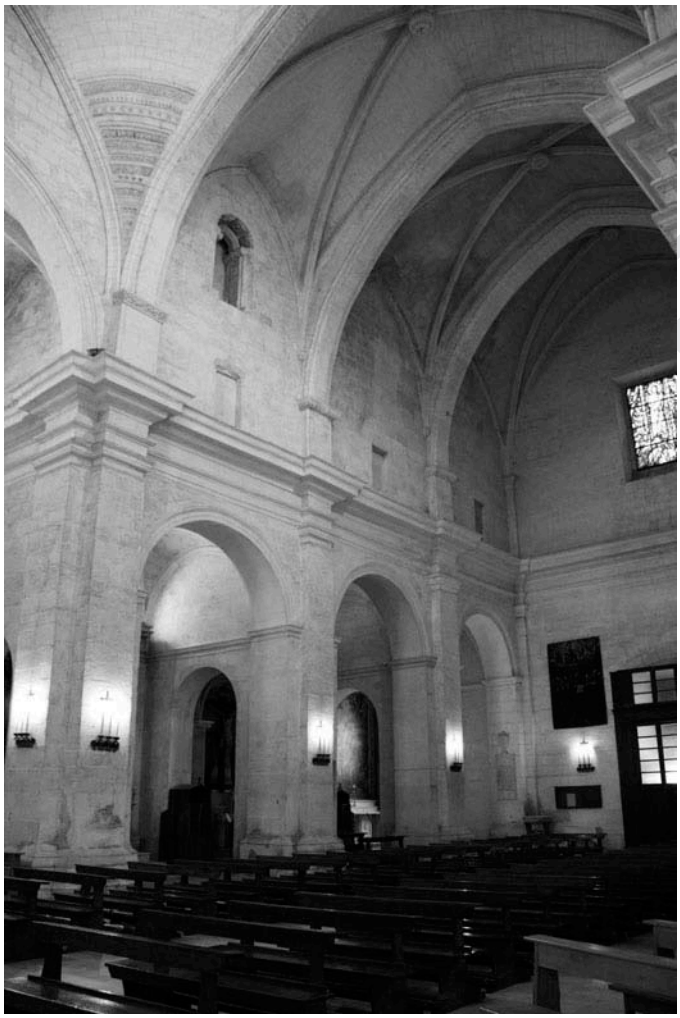

FIG. 5. View of the nave of the Jesuit church in Sassari (photo by author, authorization of the Archdiocese of Sassari). © [rightsholder]. Reproduced by permission of [rightsholder]. Permission to reuse must be obtained from the rightsholder.

It is not known what Bernardoni intended for the structure above the cornice, but one can gain a sense of his design by examining his works carried out in the Polish Province of the Society between 1583 and 1605. In these later works he adopts a classically inspired style, using round arch, barrel vaults with lunettes and situating the dome on a drum. In particular, we can refer to the Jesuit church in Njasviž (today Biellorussia, and at that time part of Lithuania), the signed drawings of which are still preserved and include the plan and a longitudinal section of the church (Figure 6), as well as the plan and elevation of the dome (Kowalczyk 1999).

It is clear, therefore, that a sharp change in direction occurred in Sassari following Bernardoni's departure from the scene. The site's response to the challenges arising from the completion of the building, in fact, moves in the wake of the Gothic tradition, but demonstrates solutions unusual for the locale (e.g., the rise of the rib vaults over the nave and the octagonal dome over the crossing). In spite of this, the work is in harmony with a different but compatible system of the structures already completed, combining functional and formal demands with an appropriate response to structural concerns.

2.2. First Step of the Metamorphosis

The springing of the transversal arches above the nave and the articulated system supporting the dome is raised about two meters by the insertion of a low-order of pilasters decorated *more gotico*. This element mediates between the two systems and is the first step of the "metamorphosis" of the Classical church into a Gothic structure (Figure 7). In the local context, the insertion of a second low-order of pilasters is unprecedented. Usually the transversal arches rest directly on the pseudo-capitals of the pilasters, set at the same level or just above the arches leading to the side chapels. Some examples from the 16th century include the church of S. Francesco and the cathedral in Iglesias, the parish church of S. Giorgio in Sestu (near Cagliari), the churches of S. Domenico and S. Giacomo in Cagliari, and finally—the most relevant for a comparison with our case study—the church of Valverde in Sassari and that of S. Vittoria in Thiesi (near Sassari) (Figure 8), both built between the last decades of sixteenth century and the very beginning of 17th century. The situation does not change even in the cases where there is a continuous and classically inspired cornice. The arches

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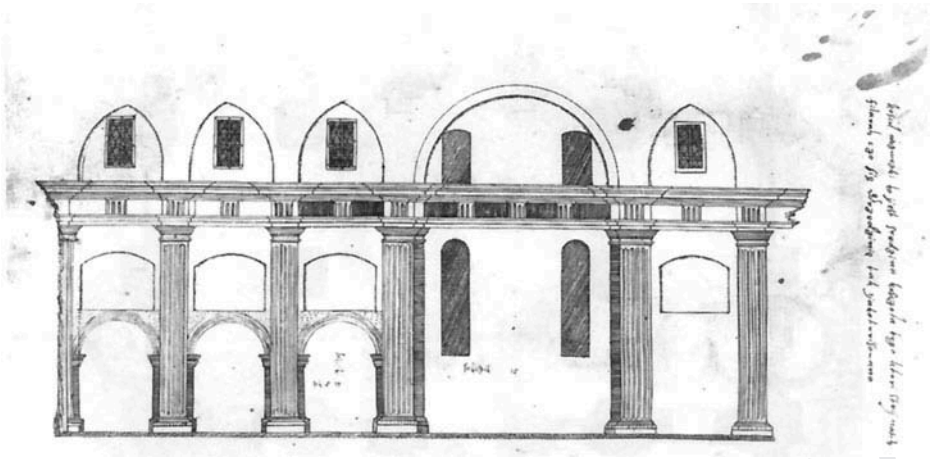

FIG. 6. Design of the longitudinal section of the Jesuit church in Njasviž (Biellorussia), by Giovan Maria Bernardoni (Bernardoni Codex, National Library of Ukraine, ms. 721/589 s., f. 17 v). © [rightsholder]. Reproduced by permission of [rightsholder]. Permission to reuse must be obtained from the rightsholder.

Q10

FIG. 7. Detail of the low-order of pilasters defined *more gotico* above the cornice in the Jesuit church in Sassari (photo by author, authorization of the Archdiocese of Sassari). © [rightsholder]. Reproduced by permission of [rightsholder]. Permission to reuse must be obtained from the rightsholder.

Q11

FIG. 8. View of the inside of the parish church of S. Vittoria in Thiesi (near Sassari, photo by author).

and the vaults, in fact, lean directly over the cornice itself, as in the aforementioned churches of S. Agostino (Figure 3) and S. Giacomo in Cagliari, which both employ coffered barrel vaults.

A solution similar to that of Sassari is adopted by the Gesù in Rome and in other contemporary churches of the Society. The stylistic discrepancy and the arrangement at the crossing, which is only slightly in accordance with the arrangement of the pilasters below the cornice, give reason to doubt derivation from the Roman model. However, it is possible that the low-order of pilasters was already included in Bernardoni's design of the church and only adapted to the taste and style used by those who replaced him after 1583. For sure this part of the building was carried out after his departure, since in 1585—according to the aforementioned letter of Giovanni Franch—it had reached the height of 22 *palmi* on one side.

Such a solution seems to have been implemented for functional reasons, as well. The rise of the springing of arches and vaults facilitated views through the openings—walled-up today, but still visible—above the chapels along the nave on the side of the convent, simultaneously allowing the creation of windows, limited to the first bay. Furthermore, to ensure the stability of the building, the thrust of the vaults is absorbed by strong buttresses emerging outside over the extrados of the vaults of the side chapels.

2.3. The Cross-Vaults Sequence—An Experimental Design?

Even more remarkable is what one notes analyzing the vaults. The experimentation or better the skill to adapt a model to the specific needs of a building started with a different design, seems to also involve the consolidated system to cover the nave with a sequence of cross vaults interspersed with transversal arches. From the longitudinal section carried out on the center line - but also just looking at the contour of the extrados - a progression of the rise of both the transversal arches and the cross vaults can be noted, proceeding from the transept towards the façade, with an overall jump of more than one meter between the first and the third bay (Figures 9 and 10). This result is achieved by changing the geometry of both arches and ribs from one bay to the other, while keeping the imposts at the same height. That means that proceeding towards the façade, the arches, and the ribs become more pointed, creating a reduction in the horizontal thrusts. Could this structural relief justify such an unusual solution? Barring an uncertain case relating to the original conformation of the church of S. Domenico in Cagliari (Pintus 1991), other cases of buildings with a similar section have not yet been detected. So, how can this anomaly be explained?

An inspection at the level of the extrados of the vaults reveals that the explanation for this unusual solution is neither related to the draining rainwater, as each bay has a discharge point at the perimeter, or lighting the crossing, as the windows of the drum supporting the dome on the side of the nave are blind. Could there be another practical advantage, perhaps, to maintain a thrifty budget and speedy execution? Further clarification would come only from an examination of the arrangement of stone elements under the insulating conglomerate of the vaults from the extrados, but, unfortunately, this investigation has never been done.

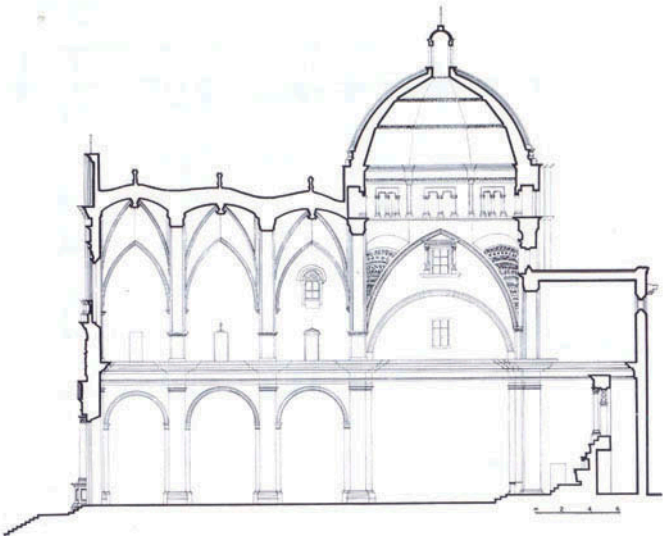

FIG. 9. Longitudinal section of the Jesuit church in Sassari (from Mossa, V. 1965). © [rightsholder]. Reproduced by permission of [rightsholder]. Permission to reuse must be obtained from the rightsholder.

Further examination of the construction process can help us to formulate additional hypotheses. As the construction of the vaults and the related arches usually proceeds from bay to bay, it seems unlikely that the difference in height between the intermediate arches could be a careless error, moreover one repeated two times in a row. Instead, this feature gradually balances the difference between the arch built into the thickness of the façade and the "triumphal arch," at the eastern end. More difficult to ascertain is whether this resulted from a mistake or, more likely, a change to the design. The documents show that the perimeter walls were built first, most likely including the façade. That means that the arch set into the thickness of the façade—necessary to support the vault of the last bay—could have been the first one to be traced. Probably the construction of the vaulting system of the nave started—as usual—in the eastern end with the construction of the "triumphal arch". The difference in the height between the two arches could be unintentional; however it seems unlikely that this feature could be the result of such a gross mistake. After all, this system was in use in Sardinia for more than a century. Perhaps the change of height is intentional, reducing the overall height of the dome or addressing other structural concerns, or achieving a better proportion between the lower and the upper registers of the nave. In any case, it is clear that the master-builders knew change in elevation between the arches before construction began on the vault paneling, since the adjustment occurs gradually. Even if eventually generated by an error, this current case study suggests that the utilized solution is evidence of the master builders' ability to adapt the model to a very specific condition.

Finally, another interesting feature to notice is the absence of a wooden roof above the vaults, a solution performed in several cases in Sardinia in the north as in the south. This solution is also widespread in many regions of the Mediterranean basin, including those of eastern and southern Spain and Sicily itself, at least from the 14th century, thus helping to define the reference coordinates of the building under examination.

2.4. The Dome: A Dialectic Between Interior and Exterior

More complex and of difficult interpretation, in several respects, is the structure of the dome; in a contradictory dialectic between inside and outside, it seems to be addressed to satisfy aesthetic-formal as well as structural instances inside, while a disorderly configuration is adopted outside, responding mainly to static apprehension. There was a construction problem far more challenging than the covering of the nave that needed to be addressed, for which it wasn't possible to rely on a consolidated local tradition. Up to that time were only two precedents in Sardinia built in early modern age. One is the dome of the nearby cathedral of Sassari (Figure 11), of an uncertain date but possibly attributable to "restoration" works

FIG. 10. View of the extrados of the vaults and the dome of the Jesuit church in Sassari (photo by author).

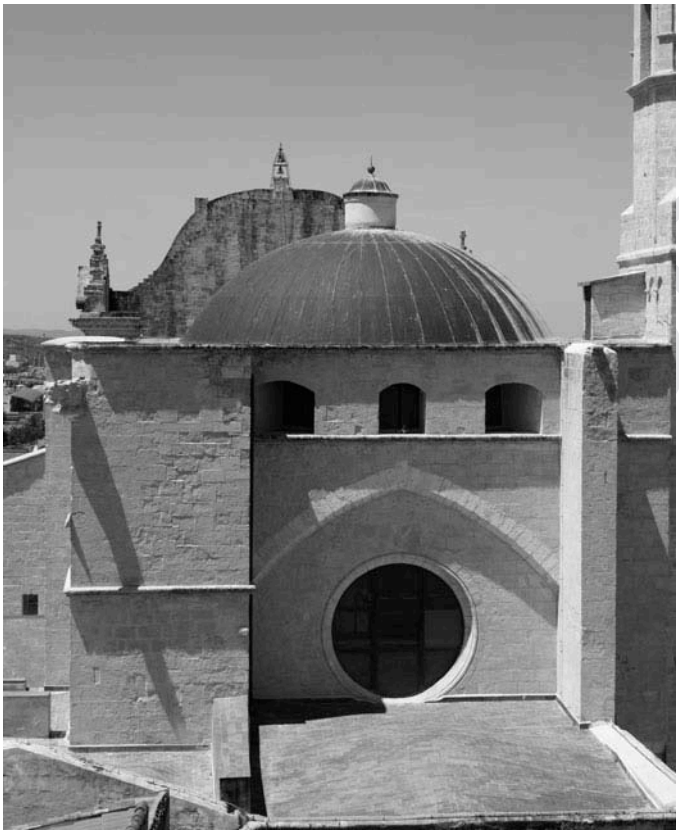

FIG. 11. View of the dome of the cathedral of Sassari (photo by author).

documented in the 1530s (Porcu Gaias 1996). The other example, smaller than the first one, was the dome of the church of S. Agostino in Cagliari (circa 1580). Both these cases—with different dimensions—are hemispherical domes. Inside pendentives in the first one and squinchs in the second connect the square of the crossing to the circle of the dome's spring line. Outside about the two-third of the dome's extrados emerge from a parallelepiped, according to a model of Byzantine origin widespread in the Mediterranean context during the middle-age, including the church of S. Saturnino in Cagliari and a few other cases in the Island (Delogu 1953).

In Sicily several 12th-century examples of hemispheric domes emerge from prismatic masonry volumes (with a circular footing inscribed on a square or octagonal plan). Examples include those of the Cappella Palatina in the Norman Palace and the church of S. Maria dell'Ammiraglio (also called Martorana) in Palermo, and that of SS. Trinità in Delia (Castelvetrano). During the first decades of the 16th century, Sicily seems to recover this model in small churches and chapels (Giuffrè 1996; Nobile 2002) within a general phenomenon of reviving 11th and 12th century architecture of Norman Sicily. Some examples may be found at the architectural complex of the Annunziata in Trapani, the church of S. Egidio in Mazara del Vallo (Figure 12) and in the church of S. Maria dello Spasimo in Palermo. Is there a relation between the Sicilian examples and those of Sardinia? The circulation of master builders between the two islands has been confirmed (Nobile 2013), perhaps contributing to the transmission of technical knowledge between them. Thus upstream of the appearance in 16th century's Sardinia of this kind of dome, in the cathedral of Sassari first and later in the church of S. Agostino in Cagliari, a link to Sicilian architecture could exist.

Shortly afterward, the design carried out in the Jesuit church in Sassari seems to be a first attempt to overcome the "neo-Byzantine" model in terms of the concept of a modern dome, although it shares some elements from the cathedral's dome. This finding is particularly evident on the exterior of the church, where a parallelepiped buttressed at each corner surrounds the inner structures (Figure 13). In fact, while at the cathedral of Sassari the footing of the dome remains inside the

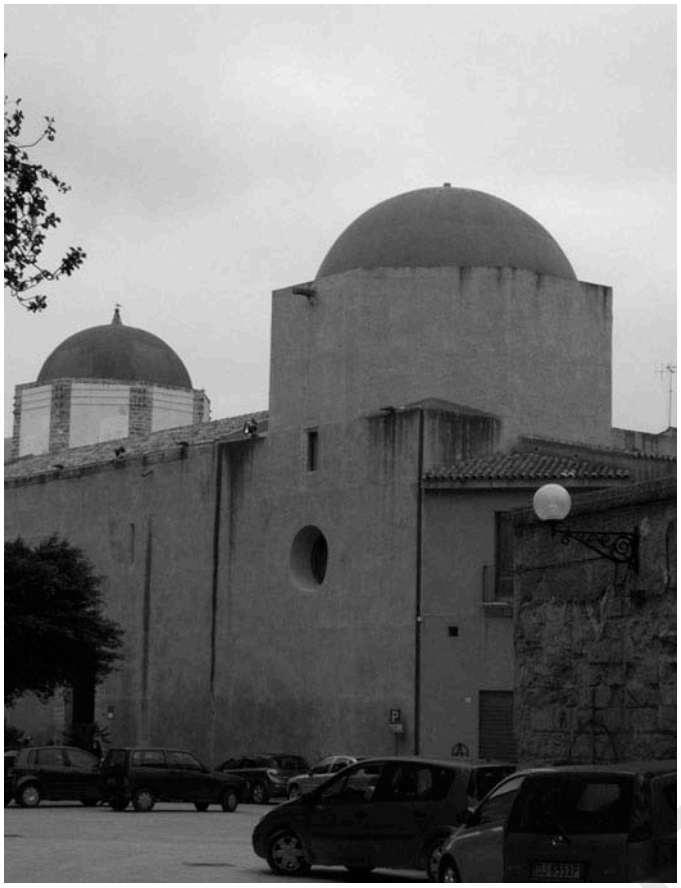

FIG. 12. View of the domes of the church of S. Egidio in Mazara del Vallo (Trapani; photo by Marco Rosario Nobile). © [rightsholder]. Reproduced by permission of [rightsholder]. Permission to reuse must be obtained from the rightsholder.

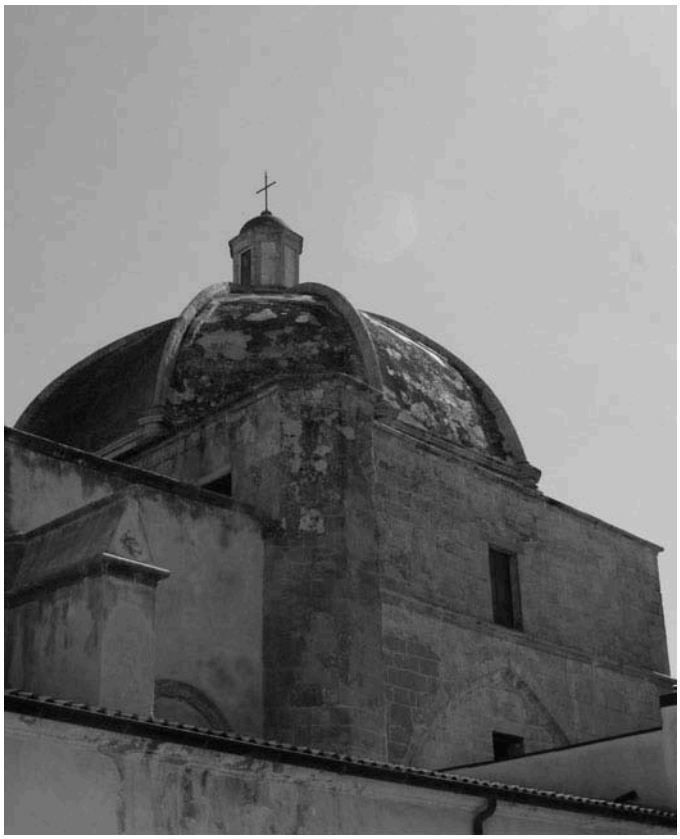

FIG. 13. View of the dome of the Jesuit church in Sassari, with a parallelepiped buttressed at the angles surrounding the inner structure (photo by author).

parallelepiped, the octagonal ribbed dome at the Jesuit church rests on the parallelepiped and appears entirely visible from the exterior.

However, the masters of the Jesuit church carry out a more articulated solution, whose design still demonstrates some structural devices of Gothic origins. For example, above the pillars of the crossing at the four sides of the square base, large pointed arches—the profile of which also emerges on the outer facing—transfer the load of the overlying structures. On three of the four sides of the crossing, below the pointed arched, depressed arches set directly above the cornice mark the entrance to the presbytery and the two extending arms of the transept (Figure 14). These are covered by vaults unusually lower than those of the nave. This allows three windows to illuminate the crossing. They may have had also a role in specific liturgical functions related to local feasts. Indeed, the presence of terraces over the vaulting of the transept arms and the presbytery create the possibility to look in trough the windows. In sum, similarities exist between the two principal domes of Sassari, but the differences are substantial, likely due to a change in the models of reference and the possible involvement of new actors at the local building sites.

2.5. Dome Models Abroad

To account for the sudden appearance in Sardinia of stone domes during the 16th century, these complex works of stereotomy, one should look to additional models. As previously discussed, construction expertise could come from Sicily by means of master masons moving between the two islands. In Sicily, they may have received specific training for building chapels of exposed stone and covered by domes, having in Sardinia the opportunity for experimentation at an even larger scale. This theme, which had a precedent application in the Norman age (12th century), had come, back into vogue during the early sixteenth century from western Sicily, to know then an experimental development, now freed from the Romanesque examples, in the south-eastern side of the island (Giuffrè 1996; Nobile 2002).

This hypothesis is made increasingly plausible with an examination of a detail present in both of the biggest domes in Sassari, as well as by a third example even close to this Sicilian typology: the church of Valverde. At this church, a small dome

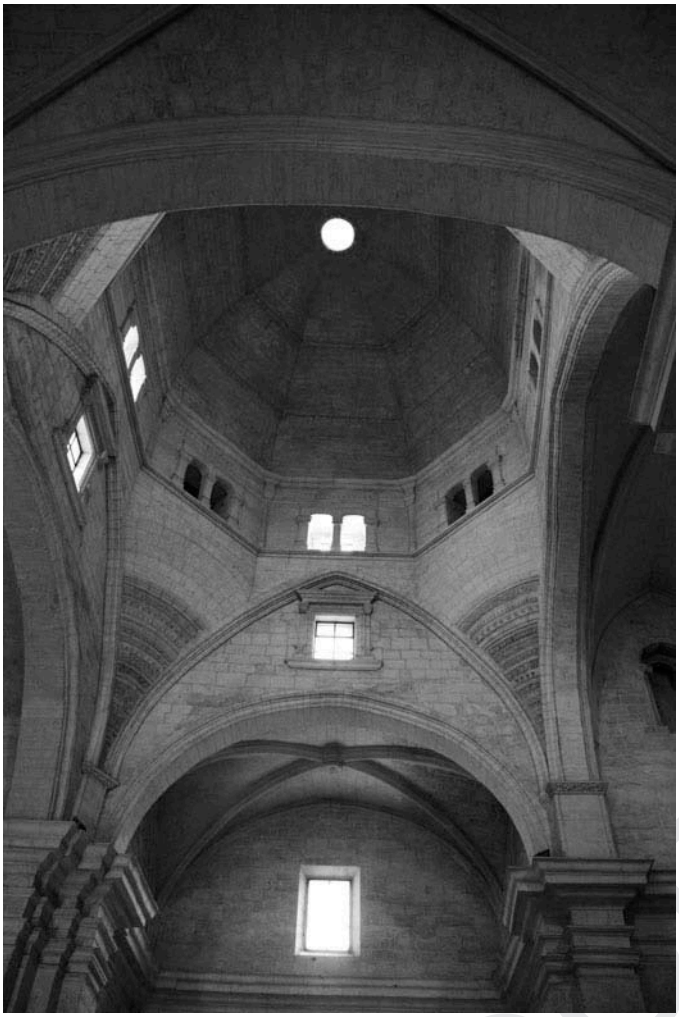

FIG. 14. View of the crossing area covering system in the Jesuit church in Sassari (photo by author, authorization of the Archdiocese of Sassari). © [rightsholder]. Reproduced by permission of [rightsholder]. Permission to reuse must be obtained from the rightsholder.

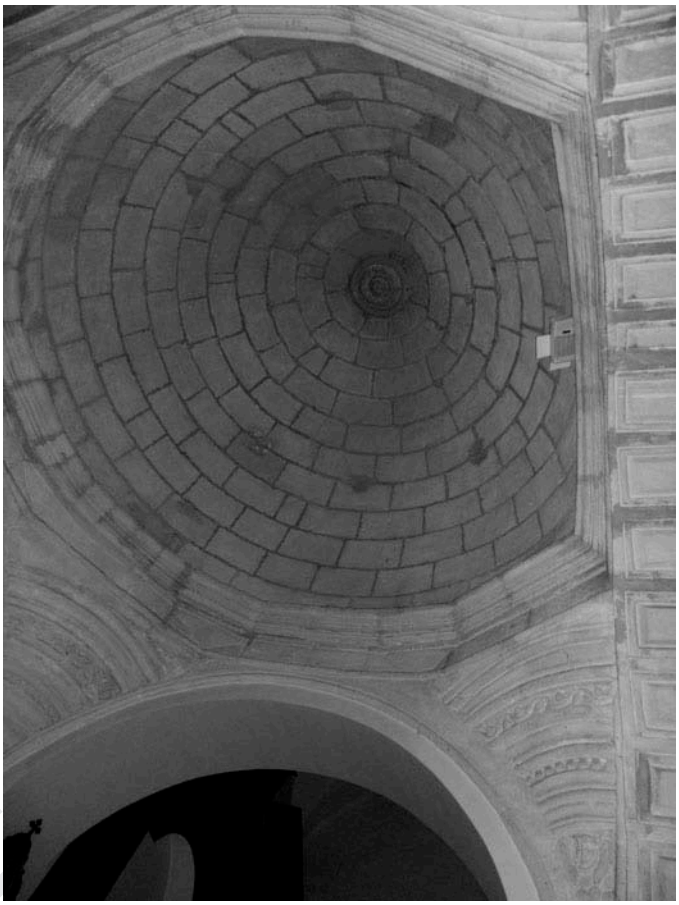

FIG. 15. View of the small dome that cover one of the side chapels in the church of Valverde in Sassari.

covers one of the side chapels (Figure 15), which may be contemporary to the dome of the cathedral (Nobile 2013) or, according to another hypothesis, built at the end of the same century (Porcu Gaias 1996). The overlapping sequences of vaguely Classical minute ornamental motifs, present in the pendentives of the Sardinian examples (Figure 16), also in the cathedral (Mossa 1965), resemble those designs developed in some dome-covered chapels of southeastern Sicily from the third decade of 16th century. Notable examples include the chapel Naselli in S. Francesco in Comiso (Figure 17) and the chapel of Confrati in S. Maria di Betlem in Modica (Nobile 2009). However, other references may have influenced the Sardinian domes. Finally, the intertwining of different external influences certainly played an important role, at the Jesuit Church in Sassari.

The appearance of a dome partially or entirely emerging from a parallelepiped built over the crossing, or more generally over a square plan space, may be found in more coherent and sophisticated examples of the early modern age in Spain. An interesting formal sequence in Seville, where these kinds of domes were adopted in three examples: in the main sacristy, designed by Diego de Siloé and built around 1542 (Sierra Delgado 2000); in the Royal chapel of the cathedral, attributed to Hernán Ruiz the Younger and built between 1562 and 1575 (Morales 1996); and, thirdly, in the church of the Jesuit Professed House dedicated to the Annunciation, and also attributed to Hernán Ruiz the Younger from between 1565 and 1579 (Morales 2012). This last example is a Jesuit church, and, in many respects, represents the most relevant in our case study. A dome covers the crossing of its Latin-cross plan, which is preceded— as in Sassari—by vaulted spans absent a wooden roof above (Figure 18).

Regardless of a possible direct link between the domes of Sassari and elsewhere, it seems reasonable to hypothesize the circulation of models within the Assistance of Spain of the Society of Jesus. The same employment of a half-tiburium can be detected, for instance, very far from both Seville and

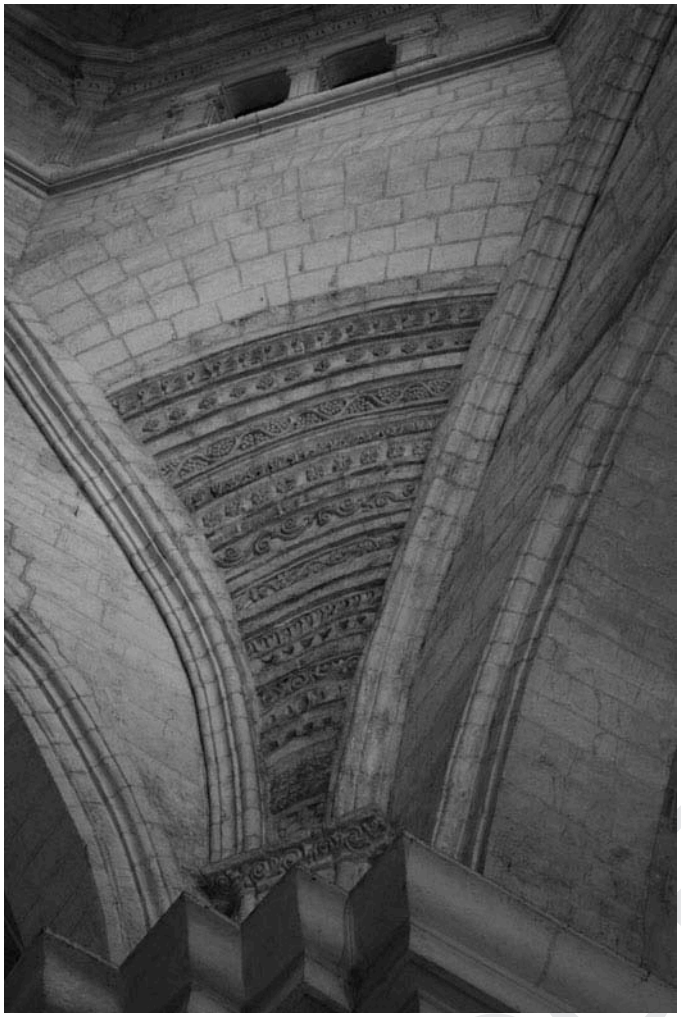

FIG. 16. Detail of a pendentive of the dome of the Jesuit church in Sassari (authorization of the Archdiocese of Sassari). © [rightsholder]. Reproduced by permission of [rightsholder]. Permission to reuse must be obtained from the rightsholder.

FIG. 17. Detail of a pendentive of the dome of chapel Naselli in the church of San Francesco in Comiso (Sicily).

Sassari at the church of the Jesuit College of Coimbra, under construction from 1598 (Varela Gomes and Lobo 2012).

Moreover, in Spain a similar solution appears also in other examples related to the influence of the Escorial and of the artistic policy carried out by Philip II, an influence already noticed also in this case study with reference to the Classical language of some elements (Maltese 1966; Segni Pulvirenti and Sari 1994; Porcu Gaias 1996). An interesting example is that of the Cerralbo chapel in Ciudad Rodrigo, designed by the architect Juan the Valencia and under construction from 1585 (Rodríguez Gutiérrez de Ceballos 1975; López Mozo 2013). As in the Jesuit church of Sassari, the dome completely emerges from the parallelepiped. Related to the dome in the church of the Escorial, it rests on a cylindrical drum built over a low parallelepiped. Why does the drum disappear in Ciudad Rodrigo, a phenomenon also found in other Spanish monuments of the seventeenth century? Perhaps it is a prudent choice inspired by structural considerations, similar to that exposed by Bramante for the tiburium of Milan cathedral at the end of 15th century.

In his famous *Opinio*, in fact, Bramante expressed his aversion to the octagonal tiburium by proposing instead a square one, which he considered much more solid than the other due to the direct support of each side upon the pillars below (Patetta 1987). The sequence of volumes including a low parallelepiped—not visible from the inside of the crossing—drum and dome had been used in some churches of Tuscany

FIG. 18. View of the half-tiburium of the church of the Jesuit Professed House dedicated to the Annunciation in Seville.

from the end of fifteenth century and throughout the 16th century. Early cases include the church of S. Maria della Consolazione in Todi or S. Biagio in Montepulciano, while a later example is S. Maria Nuova in Cortona.

The solution applied in the Jesuit church in Sassari does not reproduce exactly any of the aforementioned models; however, it combines elements shared with them. The upper part of the parallelepiped supporting the dome, in fact, hides an octagonal drum with mullioned windows forming a pseudo-gallery, accessible only from the outside and contributing little to the illumination of the crossing (just three windows of eight capture light). The inner octagonal drum seems, therefore, inspired by formal issues, while structural concerns may have dictated the elevation of the parallelepiped surrounding the drum to level with the foot of the dome.

Over the parallelepiped, a scaffold of rugged stone ribs emerges on the extrados of the octagonal dome surmounted by the lantern. The ribs present a molded element at the foot of the dome and generate a chromatic contrast with the conglomerate mixed with terracotta covering the extrados of the dome. That of the Jesuit church in Sassari is the first case of octagonal dome with ribs on the extrados in Sardinia, perhaps following Italian models. The result vaguely resembles the Brunelleschi prototype, still imitated during the sixteenth century on the Italian peninsula (especially in Tuscany).

The documents kept at ARSI show just a few names of the Jesuit Brother masons participating in the completion of Sassari's church, although they play but a minor role. They are mainly Sardinians trained by Bernardoni during his stay on the Island, Gavino Crisostomo, Bainzo de la Justa, and Cosimo Marongiu, and one brother from Naples, Marzio de la Corte (Turtas 1986). Unfortunately, these sources do not give any indication of the head master at the site after Bernardoni's departure. Again from Franch's letter, one can surmise that the best master builders working in the local context had been consulted during the construction of perimeter walls (Turtas 1986). It is probable, thus, that they were involved in the more complicated construction of the roofing system.

One may also suspect that military engineers in the service of the Spanish Crown intervened; the Jesuits refer to them in their letters as the only professionals of experience in Sardinia at the time of the completion of the church (ARSI, Sardinia 16, f. 102r; Garofalo 2012). This suspicion stems in particular from the formation of the dome and the underlying parallelepiped with its respective buttresses at each corner changing in shape—polygonal on the west side and rectangular on the east side, placed perpendicular to the wall. A small stairs set in the thickness of the same buttresses allows the overall inspection of the covering. The military engineers engaged in Sardinia during the 16th century came both from Spain and the Italian peninsula (Segni Pulvirenti and Sari 1994); thus, their involvement could explain some characteristics of the Jesuit church in Sassari, especially for those structures built over the crossing.

3. CONCLUSION

This case study presented clear evidence of the tenacity of building practices from one hand, but reveals at the same time a significant intertwining of external influences, especially in terms of construction procedures not usually included in local practice, as for the dome. The completion of the monumental church does not seem to be accompanied by clashes or debates regarding stylistic choices. The only concerns documented before beginning the vaults and the dome seems to be related to the overall success of the building process, clearly expressed by the administrator of the building, Giovanni Franch, in his letters of 1585 and 1587. Asking repeatedly for an architect from Rome—who never arrived—Franch especially outlines the difficulties faced while constructing the vaults, which required expertise beyond the reach of the Jesuit brother masons already employed in Sassari.

FIG. 19. View of the vaults and the dome in the church of S. Michele in Alghero.

Passing the baton in the direction of the building site presumably generated a metamorphosis of the original design to incorporate other architectural cultures. This change could have various explanations, such as taste or technical expertise of the unidentified masters, who directed the construction of the vaulting system. One cannot exclude that the impression of structural reliability had been an important parameter of choice. That point does not mean, however, that the final decision resulted in a more efficient and durable structure than the original plan, but perhaps this approach could be the impression of both the masters and the clients and their intention in choosing forms related to an established and—for this case—more reassuring praxis. Anyway, the final result was a striking solution, a unique case of progressive rising height of the nave vaults, which shows the high versatility of the ribbed vaulting system, which allows adjustments and modifications due to its remarkable flexibility.

In Sardinia, the coexistence of building solutions and formal models belonging to Gothic and Classic architectural culture fades during the seventeen century. The Jesuit church of San Michele in Alghero, under construction from the second decade of the seventeenth century and probably completed in the second half of the same century (Nughes 1990; Segni Pulvirenti and Sari 1994), gives a clear evidence. The main manifestation of change lies in an alternative and by then conventional solution adopted for the vaults, namely a generalized use of barrel vaults in combination with a dome on an octagonal drum (Figure 19).

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