In the year of 1708, the College of Santo Antão integrated the wedding festivities of D. João V with Maria Anna of Austria (daughter of the Holy Roman Emperor Leopold I), staging a play under the auspices of the Jesuit Father Inácio Vieira (1678-1739) who considered it the "most complete tragedy made in Portugal during our times".  

If, in relation to the wedding there is nothing to report about the chosen location, the theatrical play was severely criticized at the time by the press invoking the desecration of religious space and obstruction to its use over a long period.

"[…] performed in the church (place for its decency, indecent for similar play) preventing, with its structure, the use of the main chapel and church for a long time, jeopardizing the performance of ministries, masses or divine offices during the days of this act".

Although, as we shall see, the fact can be pragmatically explained due to lack of alternatives, the truth is that such kind of performance was no novelty in that space, but rather a common and legitimate use founded over the college's tradition in theatrical practice, an application of the lectures on perspective that Inácio Vieira, himself, contemporaneously ministered at the College's Aula da Sphera.

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1 "[…] tragedia que em Portugal se fes mais completa nos nossos tempos". Vieira 1716, f. 317. According to Mello (Mello 2006, p. 79) the play was Tergemina Austriacae Aquilae Corona composed in three acts by Manuel Ferreira.

2 "[…] reprezentousse na Igr.a (lugar p.la sua decencia, indecente p.a semelhante teatro) impedida a cpp.a major desta, cõ a sua estructura, e m.tos tempos inhibida a Igr.a, por cauza, p.a os seus ministerios, sem missas, nem of. os divinos, em q.to durarão os dias da sua representação." Silva 1716 in Carneiro 2003, p. 31
Indeed the church, and specifically its main chapel, would be the place by excellence for the Theatrum Sacrum but also, when necessary, would serve the performance of classical tragedies testing out, in either case, teachers and students’ ability in defining spatial perspectives, as well as all the scenery machinery associated with its implementation and transformation.

As for the royal wedding seems to be no doubt of Inácio Vieira’s direct involvement, based upon his written production on perspective, but also on optics, catoptrics and dioptrics, compliant to the framework of the Jesuit culture, highly skilled, on these topics. As such we propose to develop in this paper an exploration on the characterization of scenographic space probably designed by this Jesuit priest for the event.

The Aula da Sphera

From the late 16th century to the mid-18th century the Aula da Sphera of Santo Antão’s Jesuit College in Lisbon, stands out as the leading institution of scientific practice in Portugal. After an age of intense scientific invention, particularly in mathematics and its disciplinary branches dominated by Pedro Nunes’s breakthroughs, a decline of scientific production is witnessed. The situation is restored through the Jesuit colleges’ activity from which the Aula da Sphera stands up. By joining the Clavius Academy of the Collegium Romano, gathering and exchanging scientific information as well as teachers, allowed curricula updating and taught a high level of training. Assumed as a cosmopolitan center in the Portuguese scientific educational context, in the early 18th century the Aula experience a revival of its activity concomitant with the scientific/artistic strategies of D. João V’s reign whose actions aimed to promote a magnanimous image of the crown and the cultural modernization of the nation. If on one hand the crown resumed international relations, stimulated the foundation of academies, sponsored scholarships and financed the construction of new infrastructures (such as universities, libraries and observatories), on the other, there is, towards Aula da Sphera, a royal request of opening the institution to the public, providing lectures to technicians interested in extend and update knowledge and practices, including architects and painters.
In this context, academic activity of Aula da Sphera associates the proselytism of the Society of Jesus and the aulic ambition of D. João V. Its synthesis is revealed through the theatrical drama, which incorporates and embodies taught themes (theology, rhetoric, optics, perspective and mechanics). Assumed as a preferred mean to extol Roman Catholic’s doctrine and the political cosmos, the inseparability of word and image in the theatrical experience exposes the triumphalist project of baroque society seeking the disclosure of catholic virtues and the majesty of rulers. In this pursuit the Santo Antão's college recruited foreign authorities pursuing, as seen in artistic commission and production, an Italian entail.

The role of Inácio Vieira

The systematization on visual sciences carried out by the Jesuit priest Inácio Vieira is revealed in manuscripts such as Tractado da Óptica (1714 – BN Cod 5169), Tractado de Prospectiva (1716 - BN Codex 5170), Tratado de Catoptrica (1716 - BN Cod 5165/1) and Tractado de Dióptrica (c. 1717 - BN Codex 5165/2). Their thematic sequence embrace the modern tradition defined in the 1500’s where the approach on perspectiva naturalis (regarding the nature of vision and exploring objects perception) was followed by codification of the perspectiva artificialis (graphical simulation of visual reality). However, understanding of vision and retina image, on which are founded the possibilities afforded by its geometric-mathematical interpretation and consequent graphical conversion, is instrumentalized at the service of visual deception. Perspective optical simulation and graphical resolution are managed according to their inventive and purposeful capacities determined to theatricalize spatial visual experience and extending illusory abilities to its maximum.

The perspective treatise manuscript (Tractado de Prospectiva, 1716) is organized in six chapters ordering perspective content's according to a progressive approach, since its fundaments (basic definitions and theorems) until its applications (imagery design, particularly applied to quadratura and scenography practice). If the scientific field of perspec-

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[3] The chapters are, by order of appearence: Dos fundam[en]tos da Perspectiva (f.004); Schnografia projecta (f.034); Dos pontos q[ue] chamão Accidentais, e das apparencias dos
tive is identified on the Prologue, the author circumscribes the scope of work into its application as representational art and spatial deception. Vieira affiliates the treatise discourse into Andrea Pozzo’s virtuosity, and the main scientific authority within the Jesuit community, Claude Dechales, without failing to quote sources such as Euclid (geometrical and optical fundamentals), Daniel Barbaro (set design theory), Lorenzo Tacquet (optical science and drawing instruments) or Lourenço de São Nicolau (concerning architectural composition and theory).

The Scenography

If, along the manuscript, perspective procedures tend to oscillate among Pozzo’s and Dechales’s methods on the 5th chapter (dedicated to scenography), supersede those the enunciations and schemes from the two volumes of Perspectivæ pictorum et architectorum (1693/1700). Resulting from Pozzo’s practice on painting, architecture and scenography, instead of abstract speculations, those examples are taken by Vieira as an appropriate instrument for his audience consisting, apart from society’s students, in practitioners willing to extend and update contents. Following this logic, perspective procedures concerning stage design depart from convergence and distance point methodology, steadying the perspective construction through resolution of visual cone section based upon plan and elevation recovering the costruzione legittima modus operandi. Although this route requires a larger number of intermediate graphic constructions (orthographic projections defining the represented space, recognition of taboa – the picture plane –, identification of visual ray intersection with the taboa, transference of the obtained points into the perspective image) the process reveals the need to define imaginary space through a clear fusion among

corpos de qualquer sorte inclinados (f.222); Dos tetos, e abóbadas (f.270); Da compostión da varias taboa por sy só, e a reflecióe, e as sombras (f.298); De hum instrom[e]nto útil p[ar]a a praxe (f.333). The sequence is interrupted between the second and third chapter by a Digressão opportuna Da Architetonica Civil. Linha única das orders desta Sciencia (f.090), exploring principles of architectural composition along classic orders theory, and, at the end of the work an Additamento is added exposing Metodo do irmão Pozzo com q[ue] trata colunas espirais (f.360).

graphic control in architectural practice and the illusory power of scenography. So, if in the 1st Line (De alguas praxes mais do Irmão Posso f.296 – Some more pratices from brother Pozzo), Vieira presents co-struzione legittima procedures in the 2nd Line (Das senas theatrais do Irmão Posso na pr[imei]ra p[ar]te f. 307 – From the set designs settled in Pozzo’s first book), and 3rd Line (Das mesmas senas theatrais do d[it]o Autor na 2º p[ar]te f. 312 – From the same theatrical scenery settled in author’s second book) following closely Pozzo’s sequence, exploring theatre configuration, scenery typologies and settings, visual relations with surrounding environment establishing, thereafter, tools leading to perspective projection and foundation of the desired illusion.

Figg. 1.1-6 Vieira’s Tractado de Prospetiva (1716) image l, j and l coincide, respectively, with figures LXXII, LXXIII and LXXIV from Pozzo’s Perspectivæ pictorum et architectorum (1693).

Contents provided by Vieira synthesizes, via Pozzo, the Italian modern speculation established by Lorenzo Sirigatti (La Pratica di Prospettiva del Cavaliere, 1596), Guidobaldo Del Monte (Perspectivae libri sex, 1600), Pietro Accolti (Lo ingano de g’occhi e Prospettiva pratica, 1625), Nicola Sabbatini (Pratica di fabbricar scene e macchine nei teatri, 1638) and Giulio Troili (Paradossi per praticare la prospettiva senza saperla, 1672), materialized on the practice of Giacomo Torelli, Andrea Pozzo and the Bibiena family, among others. This breviary highlights, beyond spatial viewing conditions and manipulation of the gaze, the conformation of scene mechanisms, the Scena all’Italiana as: Quinte d’Angolo (side wings
turned like book pages); Periaktoi (triangular or rhombic prisms running through pivot, coincident to the vitruvian scaena volubilis); Sipari scorrevoli (screen coming down from high above); Saracinesche (plan scenario that runs beneath the stage by means of counterweights) and Quinte mobili (infinite juxtaposition of set images through running screens over three orders of wings).

Figg. 1.7-11. Vieira's Tractado de Prospetiva (1716) image N, O and P coincide, respectively, with figures XXXVII and XXXVIII from Pozzo's Perspectivæ pictorum et architectorum (1700).

The Theatrum Sacrum

Anyhow Vieira’s manuscript goes further. More than presenting the most common range of scenographic experience it also reveals procedures concerning the Jesuit contribution: the Theatrum Sacrum whose rhetorical potentialities support liturgy theatricalization since small oratory scale until great ephemeral apparatus. If the practice is disseminated through the Company’s cultic action, models are collected by Jean Dubreuil (La Perspective pratique III, 1649), and Pozzo, whose contribution is reflected in the tabernacle machinery (Pozzo 1693, figure LXI) and the quarantore set (Pozzo1693, Figure LXVII), explored as scenographic experiments. In fact, both sources are quoted by Vieira, although Pozzo out directly, and Dubreuil via Dechales.
Fig. 1.12-14. The Theatrum Sacrum by J. Dubreuil, La Perspective pratique III (1649), Traité IV, Pratique IX, and A. Pozzo, Perspectivæ pictorum et architectorum (1693), figure LXI.

Figg. 1.15-18. Assembly of Pozzo’s scenographic devices, teatro delle Nozze di cana (Pozzo 1693, figure LXXI) and the Teatro tutto intero (Pozzo 1700, figure XLVII), over Gesù’s plan evidencing the transformation of the built environment.
Nevertheless, scenography and Theatrum Sacrum goals concur on its targets (sensory fascination manipulating the viewer), procedures (space definition through perspective image), practical implementation (subordination of perspective image to a grid projected into scene surfaces) and consequences (perceptual transformation of physical space), but with differed ranges. If scenography tends to restrict to the stage, establishing a distance space exclusively based upon visual experience, the Theatrum Sacrum tends to invade the surrounding cosmos blurring boundaries amongst corporeal and visual space, defining a space inhabited through the viewer’s eye and body, and imposing itself as place of rite and revelation of the transcendent.

Through the assembly of Pozzo’s Theatrum Sacrum, produced for the quarantore, on Gesú’s plan, we may understand the ability to operate spatial illusion. By transforming the tectonic support a perceptual synthesis among illusion and built environment is activated. Doing so, there is continuity from imaginary to real space inhabited by the observer rather than establishing an image apparatus experienced by the distance.

**Scenic space for the Royal wedding**

Vieira’s speech focuses on scenic space structurally rooted into spatial accelerations (truncated pyramid space defined by proscenium, backdrops and tow series of quinte, wings, whose arrangement can vary according to a parallel or oblique position towards the proscenium) and characterized imagetically by pictorial simulation based upon perspective potentialities. These are the data that trigger the success of the ‘tragedy’ exposed in the 4th Line (Da mudansa do teatro f.316 - Theatrical scene changings), carried out in October 1708 at the College of Santo Antão, as part of the festivities for the royal wedding.

In this enterprise Vieira validates the Ignatian community’s ability in producing a scenario with three total scene changes (a hall, a wood and a city), and many other partial changes (e.g., the wood representation changes from an image of hell into a garden or into an open landscape).\(^5\) Mentioning the three types of theatrical scene individuali-

\(^5\) "The play had a total of three changes: overall change is said to be the simultaneous replacement of backdrop, wings and proscenium; which were a hall, a wood and a city. Within the forest set other shifts were made, the so called partial changes, although they seem total just some elements where substitute". – "Tres mudansas
Scenography

ized by Daniel Barbaro (1568), tragedy, comedy and satire, manuscript notes rather than centered at the spatial image or an adopted projective methodology, submitted to previously presented Pozzo’s statements, it emphasises the mechanical apparatus of scene transitions.

But, why does a treatise on perspective, with a practical guidance, neglects the scenographic image, and consequently designed space and architectural language? Why this enthusiasm with scenographic mechanics at the expense of perspective?

First of all we must be aware that the tragicomedy genre (that in Jesuit colleges tended to focus upon the Bible or the lives of saints) required a complex mechanical apparatus to support the scenery. Nevertheless, this fact is not enough to explain this digression on mechanics. In our opinion, and according to the discourse placed in the first person, Vieira would be involved, if not the responsible, for the scene changes. The author highlights the artifice of such changes (whose effectiveness would lie in their accuracy and speed), from which depends the robustness of illusory effects. Once the viewer’s gaze could not be aware of such operations Vieira presents the employed expedients referring that the difficulty of the overall operation was increased by its physical greatness.

“Because these scenes were so vast the first had 30 Portuguese span, and so they decrease having three more wings among the proscenium and the backdrop. The first has 25 in height and finally the backdrop 14 in span”.

Explaining and characterizing its elements and measures (which automatically directs towards the idea of a truncated pyramid space

6 “Tinha pois estas senas tão gran[de] alt[ur]a q[ue] as p[rimei]r[as] tinham 30 palmos portuguezes, e assim hião em diminui[ção] tres mais q[ue] se metião entre estas, e o proscenio, o qual vinha a ter 25 palmos de alto, e finalm[en]te o ult[im]o prosenio v[is]to do teatro tinha 14 palmos de alt[ur]a […]”. Vieira 1716, f. 318. The span shall be the coeval measure of palmo de craveira (22cm) corresponding to 8 Portuguese inches (2.75 cm). However, although widely employed since the reign of King Sebastian until the end of the 19th century, the constructive practice was commonly governed by Portuguese Foot, corresponding to palmo e meio de craveira (33cm).
defined through quinte), the author does not identify either the space in which the scene is installed, or possible relationships with surrounding space. Yet, being accepted that performances developed by the Jesuit colleges took place in the courtyard or in the church, it must be considered the published report by the chronicler Joseph Soares da Silva, previously quoted, to enlighten us that the tragedy took place in Santo Antão’s church.

Given its spatial configuration, which refers to the example of the order mother church in Rome, it seems reasonable that the stage and its scenographic structure would be placed in the main chapel. This way it would take advantage of the natural setting of a built prosценium (triumphal arch), and exploited the maximum visual amplitude of the interior space over the apparatus. In addition to the information, Soares da Silva describes the production complexity aligned with the French and Italian operatic production.

“(…) and it was represented with enough sets, and for what we know, and may understand, an opera (…) as the most commons in France and Italy”.

The same affinity is presented by Vieira’s manuscript where Pozzo’s work for the Emperor Leopold I at the Austro-Hungarian court is mentioned. Such schemes, applied in Vienna, coincide to the enunciated constructions taken by the Portuguese author on his treatise. Along with Pozzo, Vieira also refers Vincenzo Bacherelli (Italian painter, introducer of the updated and informed genre of architectural perspectives, applied to scenography and quadratura, in Portugal) who exposed suggestions to the definition of scene mechanics, crowded out by Vieira’s options, praising himself for the success of such production. Nonetheless, after being presented the modus operated by Vieira

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7 “[…] e se representou sufficientem.te com bastantes bastidores, e p.a o q cá se sabe, e se pode, húa opera […] como as mais ordinárias de França e Italia”. Silva 1716 in Carneiro 2003, p. 31.

8 “[…] with variety and plausibility Pozzo was called to Germany by the Emperor Leopoldo where a theater was made for similar sceneries. A prodigious thing. Supposing that the rules taken from him, and shown before, are the same putted into practice to the mentioned theater by the author […]”. - “[…] com varie[dajde e] plau[zibildajde o imãoPosso foi chamado a Alemanha pello Emperador Leopoldo aonde lhe fes hu teatro plan[a] semelh[an]tes fabricas, coiza prodigioza, e suponho q[ue] as regras q[ue] delle tirámos, e demos atas são as mesmas q[ue] o Autor pôs em praxe no mensionado teatro […]”. Vieira 1716, f. 318.
in solving scene mechanical problems, he closes the chapter stating that would be many possibilities to realize such scenes and its changes: for instance the use of periaktai tied up to a Dechale's passage, or the use of single backdrops undertaken during the visit of His majesty D. Catarina, Queen of England, to the church of the Virgin at Vila Viçosa.

At this point, Viera continues exploring scenographic devices but under the assumptions of the Theatrum Sacrum exposed in Claude Dechale's Cursus seu mundus mathematicus (1674). As such the scheme portas de oratorio, ou modo de folhas de livro (f.323 oratory doors, or folding screen) is exposed closing the 5th chapter.

Since documented facts, especially the ones concerning the definition of measures and scene design structure, model recognition and space for its installation are clarified it is feasible to speculate about the scenery configuration and installation.

From the foregoing dimensions pointed by Vieira (proscenium 30 span, first wing with 25 span and backdrop with 14 span height), and bearing in mind the rules disseminated by Pozzo's work (truncated pyramid space, convergence of lateral wings and definition of the projective point), it is possible to characterize the scenic space through schematic plan and section tested upon the College's church plan. From this experiment stands out the correlation between the proscenium and chapel width (30 span width), proving the advanced hypothesis about installation of the theatre inside the main chapel, along with the coincidence of the Prince's eye (perspective view point) under the cruise center.

If the truncated pyramid spatial configuration, whose (virtual) vertex is aligned with the convergence point outlined on the backdrop, expresses the required acceleration to deceptively expand the scene, simultaneously, is denoted a point at the audience side which supports projection of the ideal image defined in the prototype (the prototype coincides with the proscenium, projecting the desired image into the wings and backdrop). The procedure dates back to Danti (1583) and Guidobaldo (1600), being reinforced by Sabbatini (1638), which isolates this point as the ideal location for the observation of theatrical illusionistic effects, the Prince's eye. This coincidence among point of maximum illusory resolution, the projective point, and place of maximum symbolic power, to be occupied by the King, is not an impediment on holding conditions of visual manipulation to the remaining audience given the elasticity of perspective image perception.
Still, the illusory effect could also result from a skilful manipulation of the projective procedures, as stated by Accolti (1625, 91) founded on 43rd chapter of Sirigatti (1596). In this strategy the elaborated factory should be balanced among image structure, according to perspective laws, and its adjustment according to perceptual conditions towards illusion induction embracing a larger number of possible viewpoints.

Even so, from the initial setting of a possible scenographic structure some hesitations concerning internal elements, including wings positioning, are raised. Although the scenographic model is reportedly affiliated among Pozzo’s procedures, local technical conditions and artistic ability should be considered. Which is the operational capacity in dealing with perspective illusion? On the other hand, if Pozzo’s treatise included scene regulation through oblique wings (Italian manner) and parallel wings (German genre) with the proscenium, which option was taken to the referred set design?

Lacking of scenographic experience, at least of this scale and with this number of changes, the choice of parallel wings appears as an obvious option at the Portuguese scientific artistic context. It would be less demanding, regarding the control of perspective projection, namely to images such as referred of representation of a hall and city view. Although the transfer of ideal image is supported by a regular mesh, projected onto space and dissipated over scene surfaces, this operation is quite simpler in the case of parallel wings to the proscenium. The operation performed in this manner concerns to a mesh scale reduction, while in the case of oblique wings the projection of the mesh implies transformation of its distance, angle, proportion, and
parallelism. Nonetheless, from both configurations, it seems most credible a parallel arrangement of the wings.

Concerning this option, the possible interference by members of Queen Maria Anna’s entourage or, at least, by someone from the cultural circle of the Austro-Hungarian court should be considered. Although national coeval artistic production is mainly influenced by Italian guidelines, the moment was receptive to the entry of new models influencing the needed apparatus to support the royal festivities. This way, concerning the scene structure Vieira states:

“In this way we arranged the scenes and the theatre, drawn, in part, following Pozzo’s principles and then from some notes left by Vincenzo Bacherelli, who initially wanted to take over the enterprise but by a reason of price was taken by a D. Jozeph of German nation that had come with the Lady Queen. He brought with him an Italian named D. Agostinho that finished the painting, once he had more expertise than D. Jozeph”.

Although based upon Pozzo’s modus operandi, recognizing the Italian Jesuit’s experience among the Austro-Hungarian court, the local Ignatian community initially invited Bacherelli as set designer (whose training skills are affiliated on the Bolognese model), which was quickly excluded. Nevertheless the passage mentions that the enterprise was taken by a D. Jozeph, of German provenance, whose record or trace was not found. But, about this character and his drawings some questions are raised. Were the drawings and schemes of the scenery made by D. Jozeph? Or, was him a carrier of Pozzo’s drawings, or from a disciple, once the Italian was still active in Vienna? Even if the idea is a mere possibility raised from Vieira’s speech, it is certain that Pozzo’s presence within the Austro-Hungarian court influenced local creators. In this way, strategies adopted by D. Jozeph would certainly coincide with those followed by Vieira in his manuscripts.

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Conclusion

Once pedagogical aims of Aula da Sphaera and the Jesuit demand of evangelization and triumph of roman catholic doctrine are revealed through the theatrical drama, its accomplishments synthesizes subjects such as theology, rhetoric, mechanics, optics and perspective. As such and according to coeval rhetorical goals, the scenery overvalues the event visual aspects; exciting and marvelling the observer, giving rise to illusion. Although, prints and preparatory drawings were not found, aiding to unravel the event image, Vieira’s manuscript reveals design strategies, shapes and technological support necessary to its implementation.
Bibliografia

A. Pozzo, Perspectiva pictorum, et architectorum. Prospettiva de pittori, e architetti, Roma 1700
C. Dechales, Cursus seu mundus mathematicus, Lyon, 1674
E. Grassi, Potenza dell’immagine. Rivalutazione della retórica, Milano 1970
G. Monte, Perspectivae Libri VI, Pesaro 1600
G. Torelli, Apparati scenici per lo Teatro Novissimo di Venetia, nell’anno 1644 d’inventione e cura di Iacomo Torelli da Fano, Veneza 1644
G. Torelli, Scene e machine preparate alle Nozze di Teti, Paris 1654
I. Vieira, Tractado de Prospectiva. Lisboa 1716
J. B. Vignola, I. Danti, Le Due Regole della Prospettiva Pratica di M.J.B. da Vignola, com i commentari del R. P. M. Egnatio Danti dell’ordine dei predicatori, Matematico dello Studio di Bologna, Roma 1583
J. Dubreuil, La Perspective pratique, nécessaire à tous peintres, graveurs, sculpteurs, architects, orfevres, brodeurs, tapissiers, et à autres se servans du Dessein. Par un Parisien, Religieux de la Compagnie de Jesus. Paris 1649
J. P. Xavier, Perspectiva, Perspectiva Acelerada e Contraperspectiva. Dos enganos e “dezenganos” da vista, Porto 1995
L. S. Carneiro, Teatros Portugueses de Raíz Italiana, Porto 2003
L. Sirigatti, La pratica di prospettiva, Venezia 1596
M. Fagiolo, S. Carandini, L’effimero Barocco: strutture della festa nella Roma del 600, Roma 1978
Bibliografia

M. Puliani (curr.), Giacomo Torelli: Scenografo e Architetto dell'Antico Teatro della Fortuna, Fano 1996.
N. Sabbatini, Pratica di fabbricar scene e macchine ne’ teatri, Ravenna 1638
P. Accolti, Lo ingano de g'occhi e prospettiva pratica. Firenze 1625