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Of colonization ways

Finding order and structure in Latin American cities of Potosí (Bolivia) and Ouro Preto (Brazil)

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ABSTRACT

The cities of Ouro Preto, in Brazil and Potosí, in Bolivia, were in their time the main sources of wealth on the newly conquered Latin-American continent. Intense socioeconomic relations developed there from the mineral exploration dialogued with two distinct positions in cities foundation to create distinct urban forms: while Potosí received the grid replicated across the continent dominated by the Spaniards, Ouro Preto sinuous paths is a typical posture of Portuguese medieval urbanism. Assuming that the apprehension of urban form is a thriving field in civilizations historical-cultural perception, this paper analyses these cities colonial design characteristics, as part of a research project seeking to identify levels of influence of Hispanic and Portuguese design in the formation of Latin American cities. The paper seeks to understand street network form, location of important colonial building and possible relations with two colonization ways. In order to do this, the following products were elaborated: the graphic representation of these cities' colonial layouts, with their topography and location of important colonial buildings, and respective Axial maps - and Angular Segment Analysis - of these city routes tracings. Based on Hanson's (1989) concepts of order and structure, the study draws parallels between dynamics of potential movement in these cities beyond geometric properties distinctions between regularity x irregularity. Results indicated parallels between the applied compositional principles and variables that guided the cities morphology, and between topological attributes and the position of main colonial facilities. Although with different urban forms, in both cities these colonial buildings situate on more central routes and prominent locations.

KEYWORDS

Urban Morphology, Old city centre, Space Syntax, Potosí, Ouro Preto, Latin America.

1 INTRODUCTION

Although Portuguese and Spanish colonization in Latin America had some common traits as the period in which they were developed and the mode of colonial lands' and peoples' exploration to bring wealth back to the metropole, two different cultural ways generated different city foundations urban morphologies. These aspects are investigated together with buildings location and urban grid centralities for the city of Potosí in Bolivia, of Spanish colonization, and the city of Ouro Preto in Brazil, of Portuguese colonization.

To explore the abundance of silver in Cerro Rico, an urban nucleus was created in 1545 on this Andean soil that became a city with a large population, nearly 120 thousand inhabitants in 1573 (Galeano, 1976). The rush to occupy Potosí with intense population migration prevented the complete application of the already merged grid system that followed the Hispanic colonial design. In 1572, Viceroy Don Francisco de Toledo began efforts to solidify a greater regularity to one specific part of Potosí, the city's shape received what was called an "official" section, distinguished from the one that maintained remnants of the first street developments (Arzáns, 1965).

In Brazilian lands, two centuries after the first Portuguese occupation in 1500, the soil of what now is the Minas Gerais state region also presented itself as a source of inexhaustible mineral wealth, especially gold. Unlike Potosí where minerals concentrated at a single location, Minas Gerais gold was more scattered, which related to an occupation forming dozens of settlements founded on roads opened by the Paulista frontiersman. The paths that connect these settlements turned into streets, later becoming villages and cities (Assumpção, 1989). Efforts undertaken by the Portuguese Crown to control the gold rush in 1711 became more evident with the junction of Nossa Senhora do Pilar and Antônio Dias founding the Vila Rica de Ouro Preto settlements, later the city of Ouro Preto.

Both cities had two distinct periods in their foundation. The first period did not have concrete command of the city form by their respective Crowns. Religious orders and temples outlined a spatial organization. At the second period urban interventions attempts were made to reflect a political-economic centrality that would assume greater colonial control of wealth extracted through the city. Despite economic similarities, how these cities developed reflected two different ways of producing colonies.

While the Spanish brought defined design intentions- the insertion of an orthogonal grid with a park at its centre - the Portuguese had a greater desire of adaptability, as their design considered more topographical context, and other variables (Pessôa, 2000). The dichotomy between Portuguese and Spanish origin colonies' forms in Latin America is marked contrastingly in Sérgio Buarque de Holanda's (1936) definition of zeal and flatness on the Hispanic side, in contrast to the freedom and sloppiness in the design of Brazilian cities. These different

colonization ways were further described as resulting in more regular grids for Hispanic colonies cities in Latin America, and more irregular grids for Brazilian colonial cities.

This paper seeks compare, with urban form analysis, the production of these colonial cities and the influence of Iberian mode of projecting cities on their morphological attributes. It aims to advance beyond the more obvious design distinction between regularity and irregularity to contemplate their movement dynamics, spatial centrality, and buildings and uses arrangement. The research is part of an ongoing research that aims to understand Latin-American cities formation processes, from the view-point of their colonial layout.

2 THEORY

2.1 Two cities, two foundational principles

The city of Potosí fits in the scope of the Spanish Crown "city-making" in America. Between the foundation of the first urban core Santo Domingo (1496), and the year 1580, the Spanish built over 200 cities, a number that increased by three hundred in 1630 (Terán, 1989). At the time of Potosí's establishment, what Martinez Lemoine (1988) describes as an evolution toward the regular grid system that characterized much of the urban outlines in Spanish America.

Guarda (1965), Martinez Lemoine (1988), Nicolini (1992), and Téran (1989) share the thesis that, although the scheme of orthogonal layouts for cities dates back to Greco-Roman traditions, the main legacies that unleashed the urban orthogonal projections of the called New World were (1) the experiences from medieval settlements in Spain - such as the regular layouts of Villareal [1270] and Santa Fe de Granada [1492] - and (2) the theoretical grid models of Jaime II de Mallorca [1300] and Francesc Eiximenis [1383].

Due to the absence of previous rules for design standards, Nicolini (1992) describes a trial and error process in implementing the first cities, having as an initial parameter the regular layout of Santo Domingo, refunded in 1502 (figure 1). After this, settlements went from reticular plan to orthogonal plan until they reached the gridiron plan that lasted in most Spanish colonies, from the mid-16th century (Terán, 1989).

Guarda's (1965) research demonstrates that the Ordinances of Populations (1573), the first Spanish legislation that determined rules for the implantation of colonial grid, affected postures already adopted, or pointed to directives that were not put into action. Characteristics of the grid layout more replicated in Hispanic America included (Terán, 1989, p. 68):

1. Streets as longitudinal strips around six meters wide;
2. Crossings between streets, frequently around 100 meters;
3. Spaces between street intersections as blocks to be occupied;

4. The Plaza Mayor, defined by the suppression of one of the blocks, with some variations.

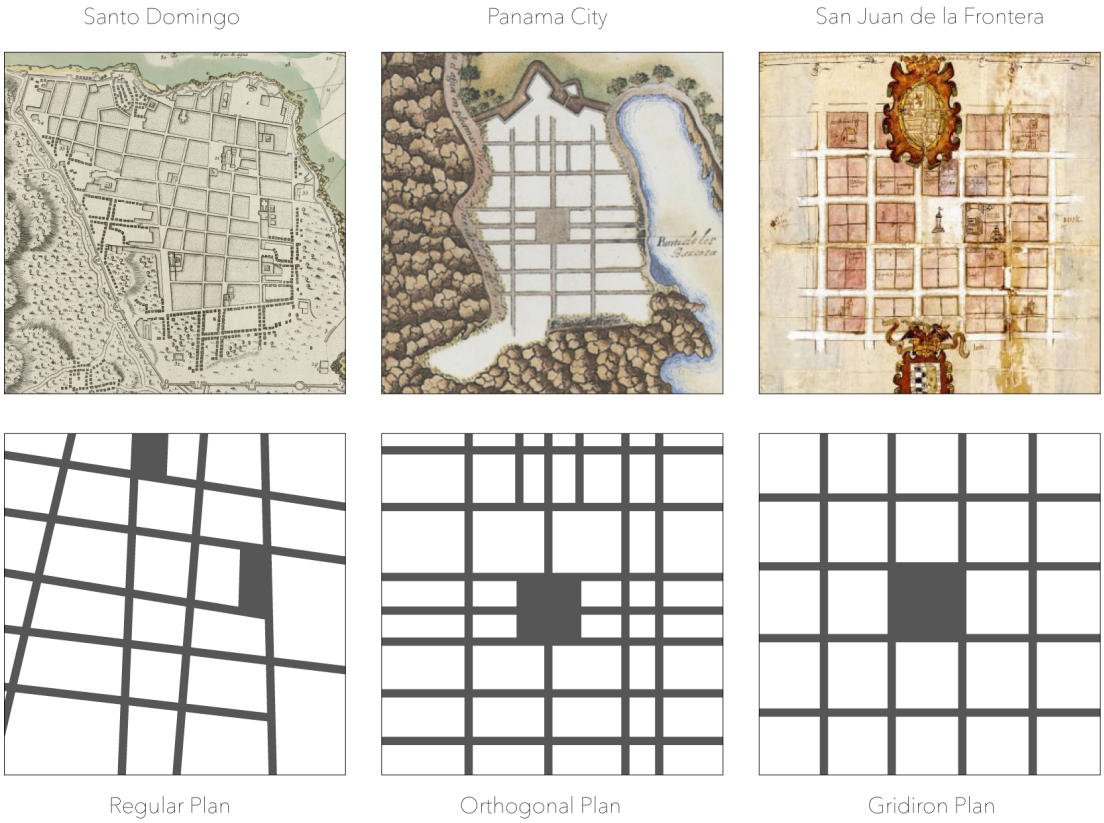

Figure 1: Example of regular, orthogonal and gridiron plan.
Source: Elaborated by the authors, inspired by Terán (1989) and David Rumsey Archive.

The Portuguese Crown brought to American lands its medieval heritage in a particular way of making cities. Teixeira & Valla (1999) distinguished Portuguese city making from other cultural urban experiences as the urban layout emerged as products of factors that preceded more formal urban planning models. Factors that influenced cities foundation mostly considered more local characteristics, thus resumed by Teixeira & Valla (1999):

1. The foundation of a primitive nucleus on hilltops or high places;
2. When near the coast, an upper city, or high city was developed as the seat of political and religious power, and a low city or riverside, hosting marine and commercial activities;
3. The search for adaptability to topography and landscape, as a reference for the placement and layout of roads, squares, and the city expansion;
4. The public buildings performed a structuring role in the city's organization, set at the confluence of squares, and marked the urban fabric distribution.

These variables allowed a variety of layouts mostly less formally regular than Hispanic cities, although some regularity could also be found. Teixeira & Valla (1999) also pointed out that most of the new Portuguese urban arrangements through the 15th and 16th centuries gained more

rationalized layouts (figure 2 above), following “Renaissance theoretical principles and concepts”, yet keeping adaptability to geographic conditions.

Conceição (2000) explains that, with demographic and material resources scarcity, the most practical way that the Portuguese Crown conquered, ordered, and explored the vast territory was the colonial system militarization. The production of Brazilian cities was conceived dialoguing between the Portuguese medieval tradition of building cities and Portuguese military engineers actions (Pessôa, 2000). This equation generated cities of regular and irregular geometry (figure 2 below). Actions of military engineers were more incisive when the foundation was under royal supervision, resulting in greater grid regularity.

Looking at the foundation of the Portuguese colonies in Brazil between the 16th and 18th centuries, Teixeira & Valla (1999) found a successive process of shifting from the “medieval urbanistic experience” to the “Renaissance theory”. This tendency had as major exception Minas Gerais occupation in the 18th century, where the organic occupation (Vasconcelos, 1977) happened starting from roads that connected the mining centers - being Ouro Preto, its emblematic example.

Figure 2: Above, the Portuguese cities Angra do Heroísmo (founded in the 16th century) and Damão, (15th century). Below, Olinda in 1665 and Salvador in 1635. Source: Teixeira (1999) and Portal Raremaps.com.

2.2 Sow and tile, order and structure

The classic historiography and sociology book Roots of Brazil published in 1936, by Sérgio Buarque de Holanda, discusses key elements of the country's colonial society formation process. The chapter entitled "O Semeador e o ladrilhador" (The Sower and the Tiler) compares the Spanish and Portuguese methods of producing their colonies and cities.

Holanda (1936) gave considerable praise to the Hispanic production of cities in the Americas, in detriment to Portuguese productions of cities. The Spanish layout was tiled according to the desire to introduce and impose order, as "a definite act of human will" (p. 96); the sower, in this case, the Portuguese, delivered cities with sloppiness, without the "ambition to architect the future" (p. 117). The point of view presented by Holanda (1936) was based on geometric distinctions of American cities and sinuosity of the streets in a part of the Brazilian cities, to spread the idea that it is the orderly grouping that has the greatest capacity to lead the cities and to fabricate its history in them.

At first sight, the very layout of the urban centers in Spanish America denounces the determined effort to overcome and rectify the capricious fantasy of the harsh landscape: it is a definite act of human will. The streets do not allow themselves to be shaped by the sinuosity and roughness of the soil; rather, they are imposed by the voluntary accent of a straight line. The regular plan is not born here, not even from a religious idea, such as inspiring the construction of the cities of Latium and later the Roman colonies, according to the Etruscan rite. It was merely a triumph of the aspiration to order and dominate the conquered world. (Holanda, 1936, p. 96)

Holanda's (1936) description thus relates an idea of order coming from the street plan geometric straightness and orthogonality of rather than from how the road network works from the perspective of people moving through the street network, and of how streets connect between themselves. Holanda's (1936) viewpoint can be related as what Hanson (1989) describes as a bird's-eye view of city design. Julienne Hanson 1989 work "Order and structure in urban design" questions the immediate assumption that the application of geometric principles such as repetition, rhythm and symmetry in the design of cities - what she calls 'order' - ensures that the city is legible. Rather, what ensures that urban systems have an easy reading comes from their patterns and hierarchies as perceived by people at the street and moving through the network, this was called by Julienne as a street network 'structure'.

Hanson (1989) used a syntactic analysis – focusing on Integration measures - of the five plans for the reconstruction of the City of London after the fire of 1666. Specifically, she looked at the integration core (the set of the most integrated axes of the system, in this case 10%) and the 50% most segregated axes in those cities. This study emphasized: (1) the distribution of morphological centralities in combination with uses and functions – as a good structure - of the city before the fire (figure 3 left) and, in contrast, (2) several problems in movement dynamics that some of the geometrically ordered planes, such as Evelyn's plan (figure 3 right), could exhibit. According to

Hanson, the most integrated axes of Evelyn's plan do not "penetrate deeply" into the geometric centre of the city, neither embrace several important buildings in the plan. Hanson (1989) metrically explained an empirical finding about cities through the ages. Seemingly chaotic and/or sinuous layouts may have an implicit order beyond geometric patterns, while orthogonal designs, of explicit order, can produce disorder in functioning through a weak structure in terms of the understanding and usage of the city.

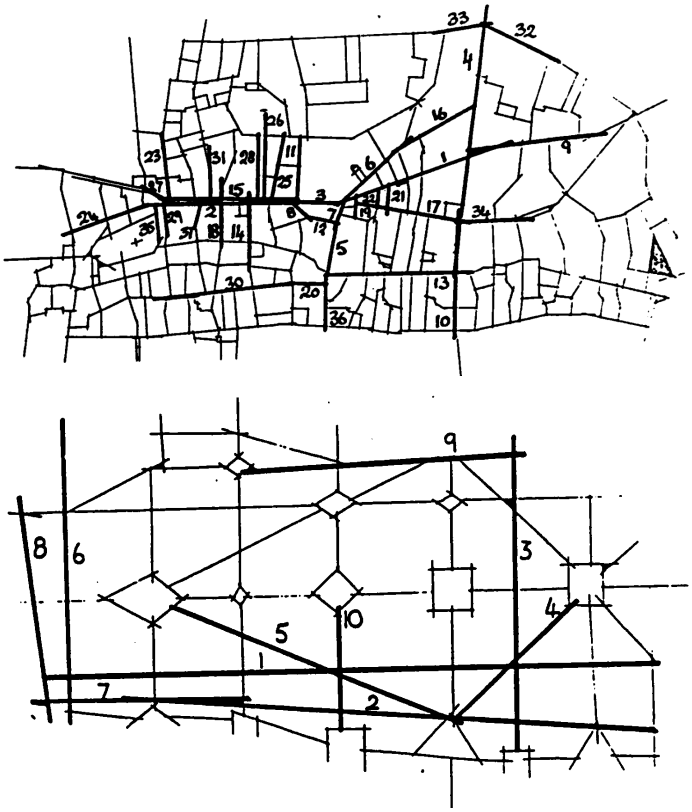

Figure 3: Maps drawn by Hanson (1989). On the left, the integration core (10% of the most integrated axes of the system) of the City of London in 1666. On the right, the integration core of Evelyn's plan for rebuilding the city after the Great Fire. Source: Hanson, 1989.

Hanson's (1989) reasoning aligns with an understanding of how the street network configures potential movement in the city (Hillier, 1996). For Hillier (1996), the correlations between the layout of the city and the way we move in it defines characteristics of the structure of a city, and its relations with uses and the formation of centralities.

The urban buzz, or the lack of it when it suits us, is the combination of these, and the fundamental determinant is the structure of the grid itself. The urban grid through its influence on the movement economy is the fundamental source of the multifunctionality that gives life to cities. (Hillier, 1996, p. 127).

Ways of representing and measuring relations between spaces were developed based on street network legibility to analyze street network spatial configuration. Integration measures in axial maps focus on topologic depth of axes that cover and connect open spaces of movement, whereas Angular Segment Analysis provides integration measures for each segment (created by the break-

up of axial maps at intersections, or by Road Centre Lines) and focuses on angular depth (Turner, 2007). These spatial configuration analyses – amongst other aspects - points towards the understanding of a natural movement cycle, where most central and integrated areas tend to exhibit more movement and attract certain uses to be placed in these areas, that themselves attract more movement, feeding back into the cycle (Hillier, 1996).

Holanda's (1936) observation, in stark contrast to Hanson's (1989) demonstrations, encouraged the search to understand possible relationships between order and structure in the founding process of Latin America cities. More specifically, the comparison between the cities of Potosí and Ouro Preto, whose urbanistic intervention by the Crowns followed distinct geometric paths - regularity and sinuosity - for similar planning intentions, becomes a rich field to further understand complexities beyond the dichotomy of the tiler and the sower.

3 DATASETS AND METHODS

This paper's object of analysis is the colonial urban layout of both cities Potosí and Ouro Preto understood as the open spaces (permeabilities) through which dynamics of movement of the city are realized (Hillier, 1996). The layout was traced over the cities old cartographies, taking as main point the 1875 Potosí's map and the 1888 Ouro Preto map, the stage where the colonial drawing of both cities were compared.

For data compilation and manipulation, the geo-referencing software QGIS was used. Based on the updated cartographic base of Potosí and Ouro Preto, together with information regarding their urban evolution – compiled mainly by Prado Rios (2017) and Vasconcellos (1977) -, the colonial layouts and contour lines of these cities were also represented. Religious and governmental buildings were located as representing the main colonial presence in the city.

Over this information colonial layout axial maps were drawn and, from these, segment maps were extracted with Depthmap program. The syntactic measures chosen for centrality analysis focused on Global Integration values from Angular Segment Analysis (ASA). These values were represented in two manners: - with the classic map, visually represented by a graduation from red, for the most integrated segments, to blue, for the less integrated ones; - similar to representations used by Hanson (1989), a selection made to highlight (a) the integration core (understood here as 10% of the most integrated segments), (b) less accessible streets, highlighting 50% of the most segregated segments.

This data was compiled to observe, comparatively, (1) Ouro Preto and Potosí urban layout formation of; (2) the influence of singular buildings in this process; (3) the resulting pattern correlation between the morphological properties with the position of these buildings; and, mainly, (4) the centrality arrangements of these cities.

4 RESULTS

4.1 The foundational process in Potosí and Ouro Preto

Following the mineral exploration and intense migratory flow, Potosí and Ouro Preto initial settlements were formed without their reigns direct control, . The manner in which the Spanish and Portuguese crowns subsequently dealt with the urban nucleus development helps comprehend differences between Iberian colonial urbanism.

The city of Potosí was built at the ground of Cerro Rico, on a hilly terrain which descends from east to west (figure 4). Prado Rios (2017) claims there are no registers about the urban complex there before Viceroy Toledo interventions from 1572, although a settlement there has been described as “disorderly, without repair or measures” (Arzáns, 1965, p.42). Toledo’s arrival to Potosí brought the search to reorder part of Potosí settlement to resemble other colonial cities, at the cost of demolishing as many houses as necessary (Arzáns, 1965). Prado Ríos (2017) states that contrary to historiography descriptions, the linear and equidistant arrangement of Religious Orders established in Potosí before the Viceroy suggests a grid layout centered in a plaza that later became the Plaza Mayor (figure 4). This shows the relevance of religious power as a grid delimiter in Potosí.

After Toledo’s interventions, Potosí morphological disposition resembled two cities, separated from each other by the river built at the Viceroy orders. The official city side approximated the gridiron was destined for the Spaniards and hosted the city main functions. Another type of occupation in the city below the river was fruit of the first occupation, where Indians were concentrated - most of the population - as well as other people on the margins of power. The official Potosí exhibits little search to adapt to the land contour lines, unlike the city layout below the river that approached the topography in a more parallel and perpendicularly orientation, and thus exhibited more streets crossings at different angles (figure 4 above). Even though the city overcame the river barrier, the geometric distinction between the two sections of the city remained. Main colonial buildings in Potosí connect closely with the Plaza Mayor, with visual and movement connections facilitated by the open space close to the Plaza Mayor and to these main buildings (figure 4 below). The city main churches connect directly or indirectly with Plaza Mayor.

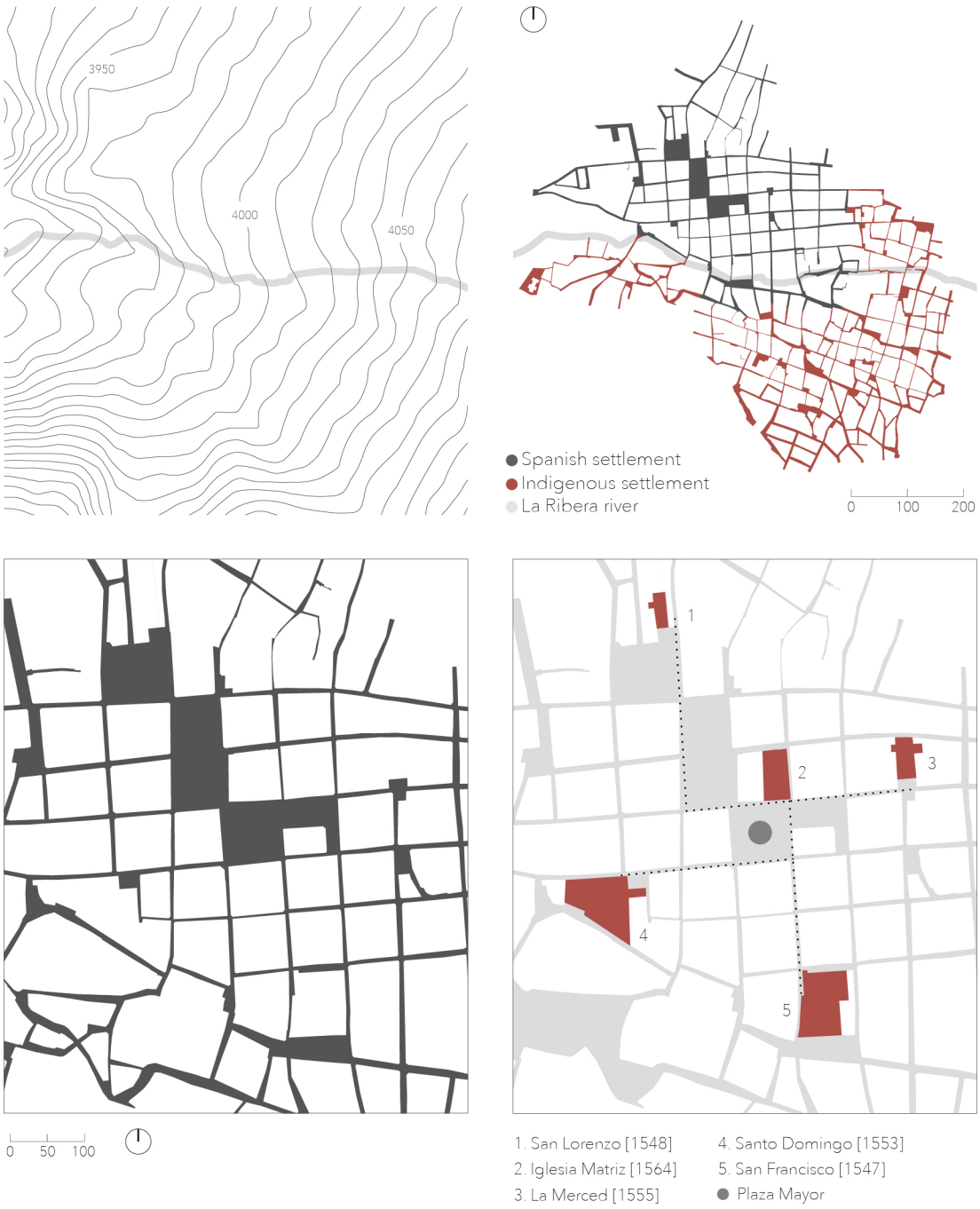

Figure 4: At the top: Contour lines and urban layout of Potosí in the early 17th century, as reconstituted by Prado Ríos (2017). Bottom: The dispositions of the religious orders in the 16th century, prior to the Viceroy Toledo. Source: own development over the map of the District Redes de Gas Potosí.

Portuguese crown interventions in Minas Gerais settlements planning were, according to Fonseca (2000) less explicit, rigorous, and systematic due to direct concerns about the exploration and taxation of the gold. In this way, the mining region Villages and settlements, a territory of rugged topography, developed with even less geometric rigidity than the foundation of most other Portuguese American cities in the 17th and 18th centuries.

Regarding Ouro Preto occupation, called Vila Rica at the time of its foundation, the basic composition principle was the existence of an elementary and organic path: a trunk road, the main route to connect the mines and villages surrounding these mines (Figure 5, above). The specific settlements that developed along the back road - each centered by a chapel and its square - became the colonial city backbone. The settlements of Pilar and Antônio Dias were the first to agglutinate, forming the colonial city urban core that that formed Vila Rica in 1711 (Figure 5).

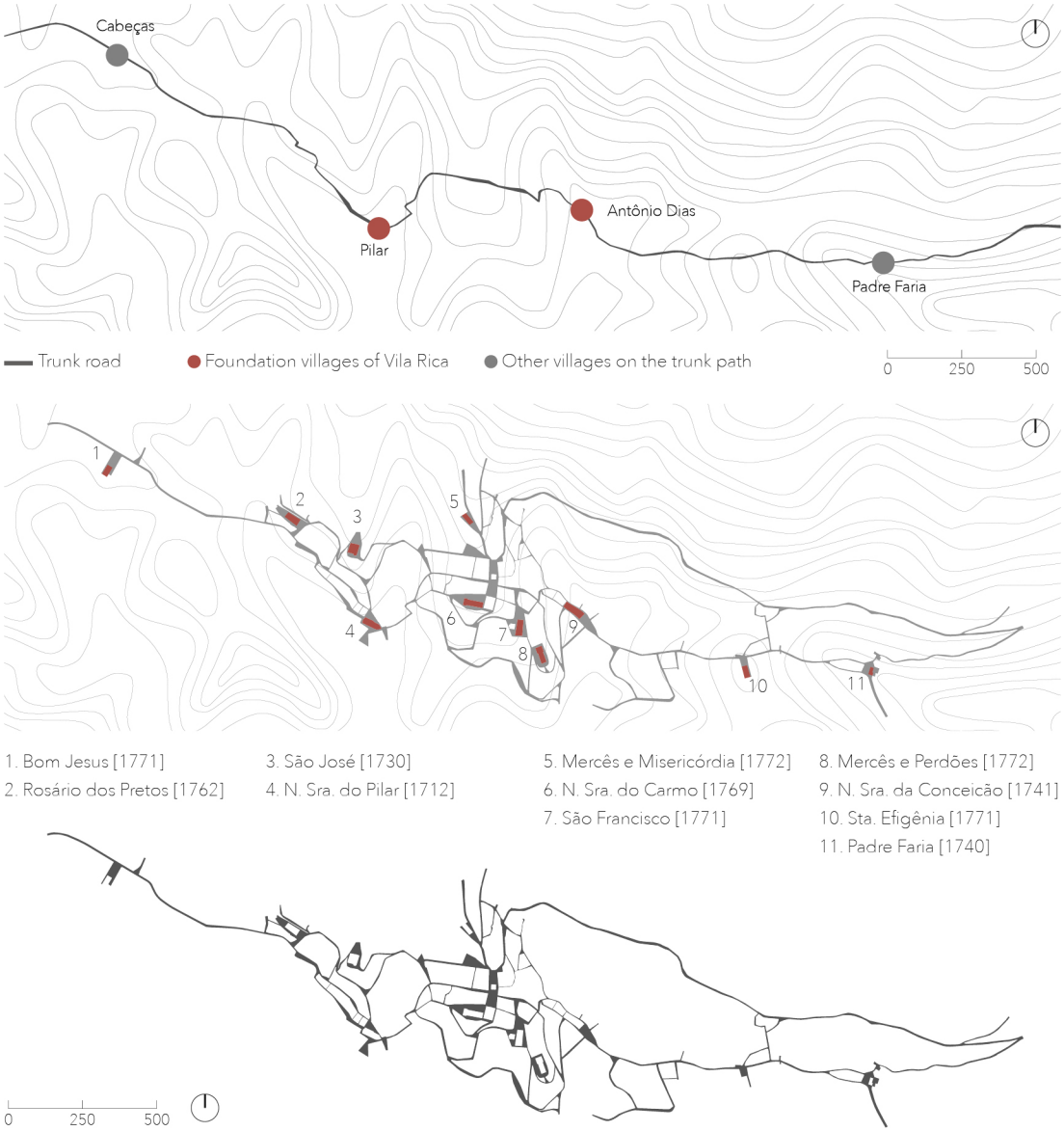

Figure 5: From top to bottom: Trunk Road, churches and open space layout of Vila Rica at 1888. Fonte: Own elaboration from Vasconcellos (1977), Reis Filho (1999), Salgado (2010) and old Cartography on cartographic base of the City Hall of Ouro Preto.

Ouro Preto street network starts, therefore, from what Fernandes (2014, p. 519) understands as "the most elementary expression of the linear genesis": the conjugation between the main street and a square. Buildings occupied the sides of the trunk road and the chapels' perimeters. These buildings were the guild of new streets and public spaces (Figure 5) as they were built on prominent topographical, following Portuguese tradition.

4.2 Order and structure in Potosí and Ouro Preto

Analysing geometric order, the colonial city of Potosí had a dense street network, with a grid pattern that stands out in most of its layout (Figure 6 top). Even in the south stretch, previously occupied by indigenous people, there is some regularity and a series of parallel streets. Potosí also exhibits several streets that cross much of the colonial city in north-south and east-west directions. Ouro Preto, on the other hand, exhibits a more linear and spread-out design, directed by the trunk road and the landforms. Ouro Preto's layout has practically no straight lines, orthogonality or some regular block pattern (Figure 6 bottom).

Potosí characteristics of regularity and densification is expressed by measures of Angular Segment Connectivity (4.47 x 3.60) and Global Integration (489.75 x 108.49) superior to Ouro Preto. In Potosí, there are more integrated segments distributed throughout the colonial city, highlighting main routes connecting the northern and southern area. The northern area still concentrates more areas with average integration levels, for the southern part there is a more abrupt drop in integration levels between neighbouring streets. In Ouro Preto the integrated segments concentrate more in the middle of the city, an area with greater street network density.

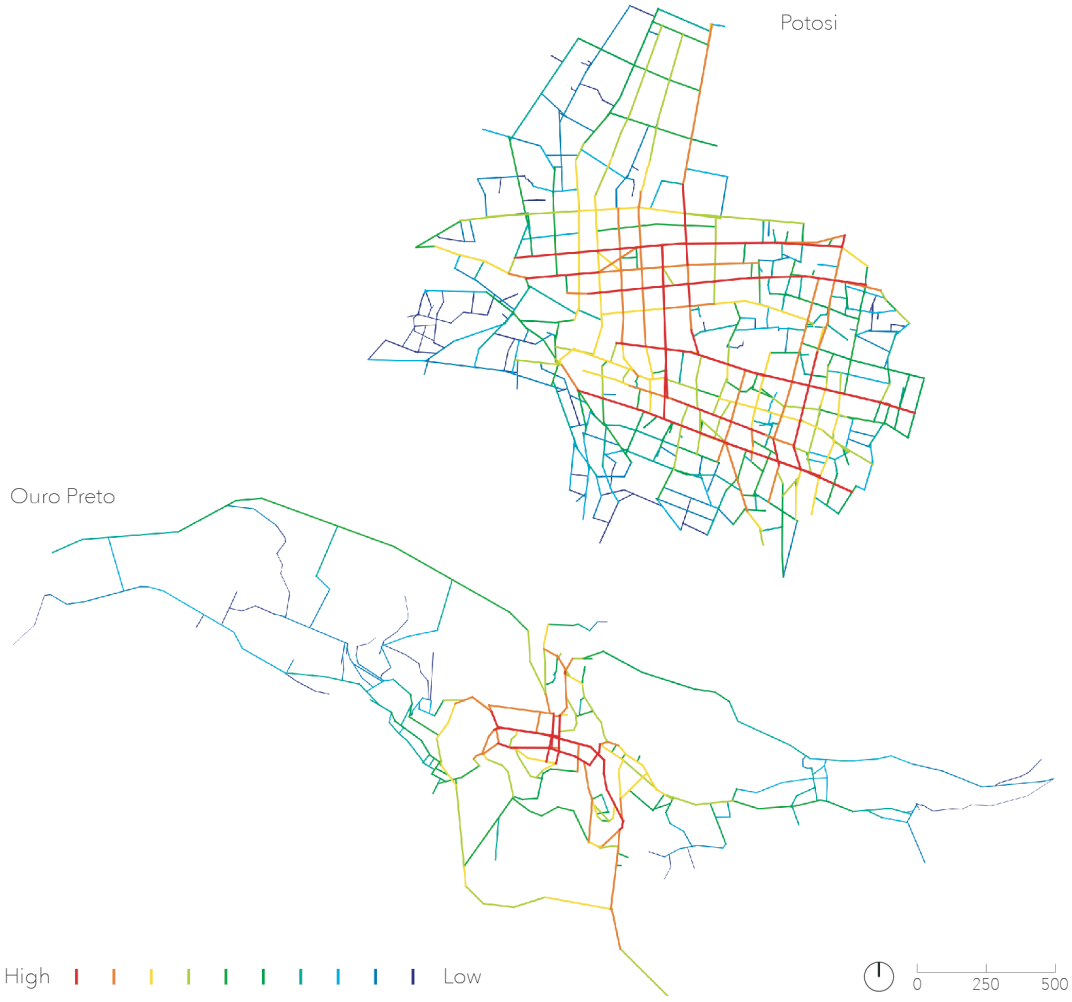

Figure 6: Segment Maps (Rn Integration) of Potosí and Ouro Preto at the end of the 19th century. Source: Own elaboration from Old Cartography on cartographic base of Potosí and Ouro Preto.

When analysing Ouro Preto and Potosí spatial structure, special attention is given to their central squares' dynamics. Both cities had, in their consolidation process, the formation of a central point through which the Crown would control wealth and economic relations developed there. Despite the obvious distinctions of the layout's orthogonality, the centres of Potosí and Ouro Preto (figure 7 above) exhibit many similarities in their morphological structure: (1) the central square is accompanied by other squares as its extension, (2) this central square is surrounded by the three most important administrative buildings, (3) from which religious buildings would be distributed in the surrounding and (4) to where the city streets converged, as this area in both cities are located very centrally within the spatial structure.

Potosí ASA map Global Integration with a focus on its centre (figure 7 centre and below), shows that only one segment that make up its central square (currently 10 de Noviembre Square) to the north, is part of the colonial city integration core. This segment is on 'Calle Ayacucho', the main street in the Pizarro complex, where most of the government buildings were concentrated. In fact, the set of the most integrated segments of Potosí city in 1875 (figure 8) highlights some specific roads, not characterized as a homogeneous whole, that can configure a morphological centre: some parts intersect Pizarro's grid axis of, parts cross the south of the city - where once there were native settlements.

Ouro Preto ASA map Global Integration (figure 7 centre and bellow), shows that all the most integrated roads in the system are located in the central square (today Praça Tiradentes) and its surroundings. The built administrative complex is precisely in this integration nucleus, with the greatest movement potential in the city (Hillier, 1996). Ouro Preto integration core (figure 8) highlights the structural importance of the trunk road in the city distribution and composition has faded in terms of topological accessibility after the city street network consolidation. The installation of Tiradentes Square and streets that formed around it created a radial and non-linear morphological hierarchy, as translated by the geometric properties of the city.

Comparatively, ASA maps show that both cities have a strong correlation between the main buildings and the most integrated system routes. Furthermore, these are also areas with more open space that can strengthen visual connection between these spaces and buildings. All government buildings, and some religious buildings, in Potosí and Ouro Preto exhibit segments forming the city integration core. Tiradentes Square, however, evokes a more accentuated morphological centrality that cannot be identified at 10 de Noviembre Square, even though the latter has been inserted at the centre of an orthogonal grid. The central square of Ouro Preto would, therefore, exhibits an even greater potential to concentrate economies of movement and distribution of the city's flows.

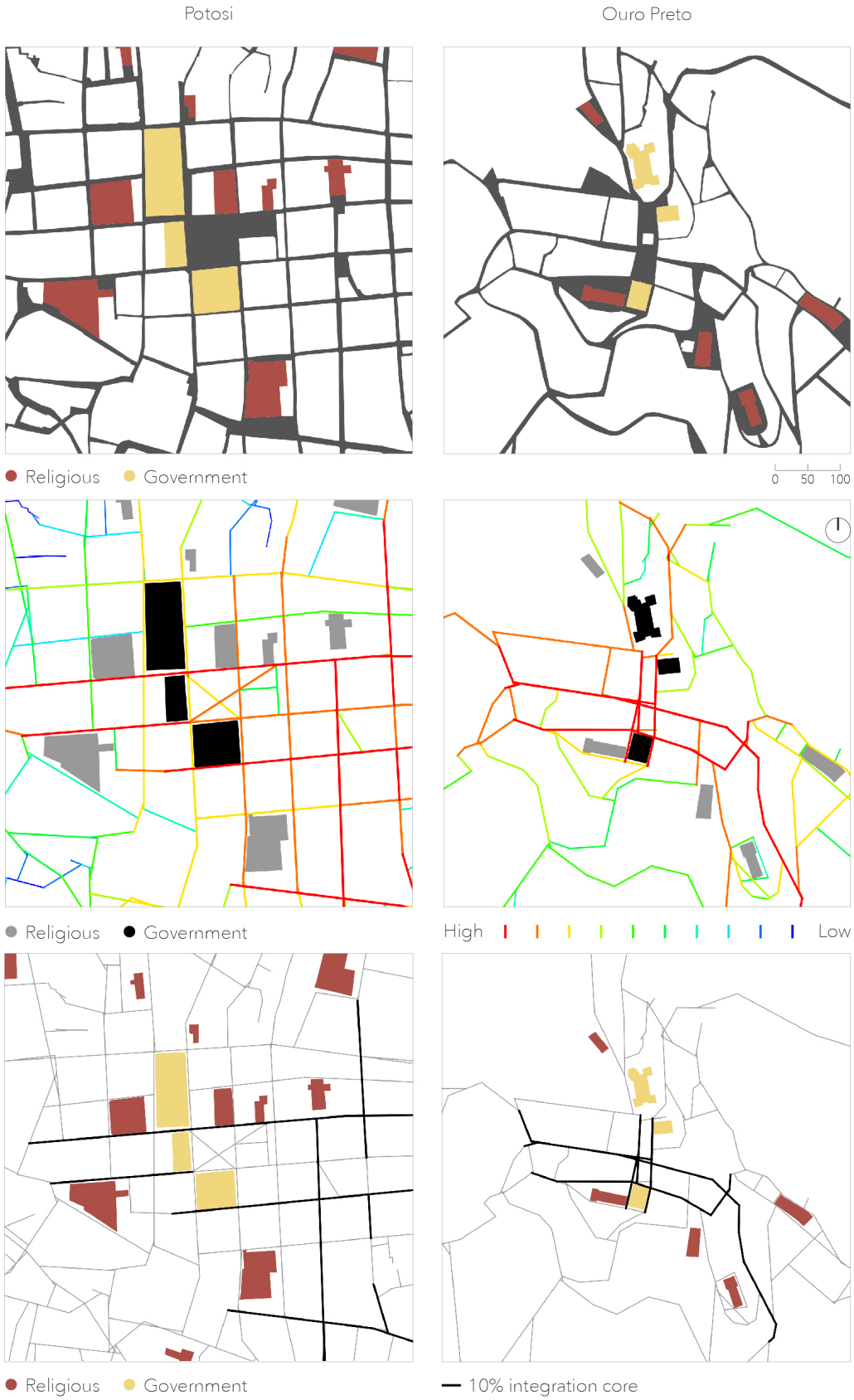

Figure 7: Above, 10 de Noviembre Square (Potosí) and Tiradentes Square (Ouro Preto) at the end of the nineteenth century, with the arrangement of religious and governmental buildings. In the centre, measure of Global Integration from the Angular Segment Analysis. Below, integration core (10% of the most integrated segments of the system). Source: Prepared by the authors from Old Cartography on the cartographic base of the District Redes de Gas Potosí and the City Hall of Ouro Preto.

Figure 8: Global Integration Measure of the Angular Segment Analysis in Potosí and Ouro Preto, comparing the relationships between the Integration Core (10% of the most integrated segments of the system) with the 50% most integrated hubs of the system. Source: Own elaboration from Old Cartography on cartographic base of the District Redes de Gas Potosí and the Ouro Preto Town Council.

5 CONCLUSIONS

This paper is a part of a research project that comparatively analyses the morphological implications of the evolution of Spanish and Portuguese cities in Latin America. This has contributed to clarify methodological strategies that can be used to compare and understand

better the formation of other cities on the continent. This research has also helped to confirm the hypothesis that, beyond the concepts of order extolled by Holanda (1936), the comparison between Iberian colonies can show structure variations that attest to implicit orders - following Hanson's (1989) reasoning - in Portuguese cities that do not have geometric rigor in their designs.

Visually the maps of Potosí and Ouro Preto might seem very different from one another in terms of geometric order, and can accentuate and exemplify Holanda's (1936) dichotomy between a stricter and more ordered Spanish colonization in contrast to a looser Portuguese colonization. However, what can be viewed as chaotic for Ouro Preto reveals a structure where the centrality sought by colonizers can be found in relation with the placement of main buildings, and in compliance with natural movement routes more adapted to the natural terrain. Furthermore, when the structure of street configuration is looked at, more similarities were found between both colonization ways, as main buildings are placed in vantage points in terms of urban grid centralities that accentuate the role of churches and, especially, governmental buildings, in dominating the urban landscape and imposing colonial order.

This research sought to observe the morphological patterns of two cities whose search for order by the Iberian crowns had as a focal point the attempt to impose a centrality - or a structure - based on a central square, where the main government buildings would be located to help control city movement dynamics. The analysis showed an obvious presence of a structured centre on the Praça Tiradentes in the city of Ouro Preto, whose sinuous layout and linearity of form could presuppose the sensation of disorder or neglect as argued by Sérgio Buarque de Holanda (1936). A stronger integration concentration at Ouro Preto centre than in Potosí imply a stronger movement control disguised by a more adaptable and friendlier approach. Corroborating Hanson (1989), this research shows that regularity, or order of the layout, is incomplete to understand the formation and functioning of cities, as it misses out on understanding hierarchies of potential movement and uses.

While some structural resemblances of these colonial cities formation were revealed, this study can benefit from further research. Other street network attributes (such as street width, visual fields, and other street segment syntactic values) as well as other correlations of land uses, can help further clarify distinctions between order and structure distinctions in Ouro Preto and Potosí. Furthermore, more complexities of Portuguese and Spanish ways of colonization can also be sought by investigating other colonial cities in different economic and political situations.

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