

SANTIAGO DE CHILE CIRCA 1850

The urban floor plan as an instrument revealing the city's general form

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As an architectural instrument that dematerializes the physical disposition of things by taking them – by means of abstraction – to the world of ideas, a plan can be understood as the hypothesis for an unproved possibility. Like this text describes, drawing a plan of the past supposes to construct a hypothesis of something improbable. By means of this abstract instrument, a hitherto non-existent reality emerges, one that not only advances knowledge but also demonstrates the power of architectural instruments.

[...] cartography acquired its most theoretical moment when plans of continents or cities, rather than describing reality, defined it, being capable of inventing and proposing the universe in the very act of reproducing it.

Solà-Morales, 1980

Useful when studying the historical formation of cities and the processes defining urban form and territorial organization, maps and plans are also instruments that show an idea of totality regarding

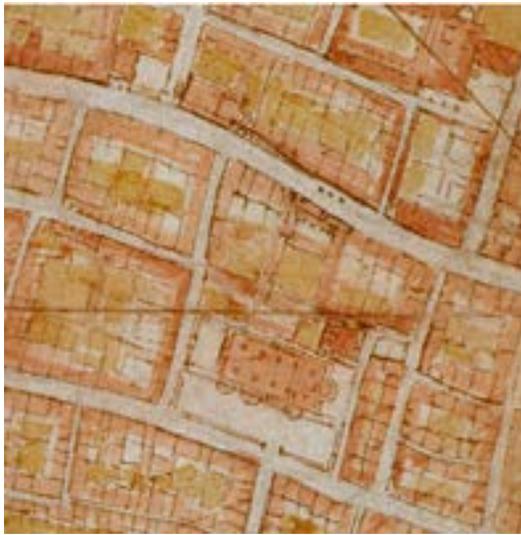


FIG 2A Leonardo da Vinci. Plano de Imola, Italia, 1502. Escala 1: 4.300. Fragmento. / *Town plan of Imola, Italy, 1502. Scale 1: 4,300. Detail.* Fuente / Source: Leonado da Vinci. *I manoscritti e i disegni di Leonardo da Vinci. I disegni geografici, conservati nel Castello di Windsor.* Roma: La Libreria dello Stato, 1941.

FIG 2B Giambattista Nolli. Plano de Roma, Italia, 1748. Escala 1: 2.900. Fragmento. / *Map of Rome, Italy, 1748. Scale 1: 2,900. Detail.* Fuente / Source: Giambattista Nolli. *Roma: la pianta grande di Roma.* New York: J. H. Aronson, 1991.

the structure, morphology and functioning of a city (FIG. 1) – that is, its general form.¹ The article introduces a research that has faced a double challenge: first, to build a plan for a specific moment in the history of Santiago de Chile (circa 1850); secondly, to state what kind of plan it is – in other words, naming and defining it, without disregarding the fact it is a plan representing the conditions of a city 170 years ago.

According to literature on the subject (Secchi, 1941, Peña Otaegui, 1944, Echaiz, 1975, Romero, 1984, De Ramón, 1985 and 2000), this is a unique moment in the history of Santiago, as the city begins to define a new stage of development – republican modernization – which will mature during the tenure of Benjamín Vicuña Mackenna and culminate with the celebrations of the Centennial (Parcerisa & Rosas, 2015). In fact, by 1850 a different kind of architecture emerges in Santiago, along with new urban spaces destined to welcome and represent the new social, political and cultural reality (Collier, 2005; Secchi, 1941; Rosas et al, 2016). However, the city lacked a plan capable of representing – in a clear and truthful way – the process by which it sought to be established as the capital city of the Republic of Chile. This unusual situation turned the 1850s into a privileged moment to build an urban plan that would make visible its general form.

The cartographic instrument capable of fulfilling this objective assumes specific features. To define it, we started by calling it ‘urban floor plan’, due to quantitative and qualitative requirements, that is, accuracy and character. We also sought to combine the representation of the general overview (specific to the city map) with that of the detail (inherent to the floor plan). Therefore, both the framing of the city and its territory, and the scale showing territorial, urban and architectural features, define the representation and, therefore, its ability to show an idea of the city.

Some references help to better understand the qualities of these instruments. The town plan of Imola,



made in 1502 by Leonardo Da Vinci, is perhaps one of the most significant and can fairly be considered one of the first of its kind.² By virtue of its character as a paradigmatic plan and work of art, the 1743 map of Rome by Giambattista Nolli (Rowe, 1979) should also be considered. Likewise, the Madrid plan by the Instituto Geográfico y Estadístico in 1872-1874 also fits this definition of urban floor plan, introducing the engineering imprint and representing through it 19th-century cultural values and epistemological ambitions.³ Santiago never had such plan, despite it already existed in Europe (FIG. 2).

As a cultural byproduct, these instruments question the limits of what is visible and prioritize a visibility ruled by the intellect.⁴ Thus, the plan does not represent the perception of something nor the vision captured by some photographic artifact capable of seeing things impossible to grasp by human perception. The plan represents perceivable elements of the surrounding environment – a building, a square, a street – abstracting and transferring them into a two-dimensional document. The plan allows the simultaneous understanding of what is actually distant in space and the places that have been known over time. Its fundamental feature is that they function as architectural plans (Desimini & Waldheim, 2016), allowing the recognition and understanding of the city's general form and, with it, the set of ideas behind it.

The construction of Santiago's urban floor plan, 170 years later

This plan is meant to solve the discordance between existent cartographies and the city's actuality to the date of study: as an urban cartography of Santiago of Chile in the 19th-century is limited in its scope and contents (Martínez, 2007). In it, we find different plans: from the ones of early-century travelers such as Peter Smidtmeyer (1824) and John Miers (1826), who recapped the same imprecise, incomplete information from those of the 18th century (Frezier, 1714; Molina, 1776; Sobreviela, 1793) to the 1831 one by Claudio Gay – the first example based on a scientific survey, although incomplete given its general framing and the kind of information it delivered (González, 2007). Others derived from it, expanding the outline and introducing schematic architectural plans of the main buildings. This is the case of Herbage's 1841 plan (which, on the other hand, regressed in its geometric definition) and Gilliss's, published in Washington in 1855. On the other hand, Esteban Castagnola's 1854 plan, in addition to specifying the buildings' floor plans, was the first to show the western expansion that the city had already experienced, including the Quinta Normal de Agricultura installed almost twenty years earlier. However, the plan kept the city's limit to the south at the San Miguel canal, in circumstances where the penitentiary and the slaughterhouse had already been installed in the vicinity of De la Aguada trench a few years earlier. A plan more consistent with the urban facts would have to wait until the 1860s. This was achieved by the 1864 Teófilo Mostardi-Fioretti plan, which extended the fram-

FIG 2C Instituto Geográfico y Estadístico de España. Plano de Madrid, España, 1872-1874. Escala 1: 2.000. Fragmento. / *Plan of the city of Madrid, Spain, 1872-1874. Scale 1: 2,000. Detail.* Fuente / *Source:* Instituto Geográfico y Estadístico. *Cartografía básica de la ciudad de Madrid 1872-1874.* Madrid: Colegio Oficial de Arquitectos de Madrid, 1979.

FIG 3A Plano de Santiago de 1910. Escala 1: 5.000. Fragmento / *Santiago's 1910 plan. Scale: 1:5,000. Detail.* Fuente / *Source:* FONDECYT N° 1085253

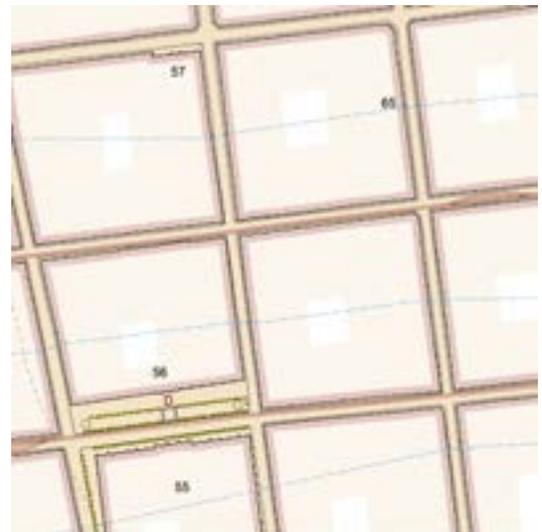
FIG 3B Plano de Santiago de 1890. Escala 1: 5.000. Fragmento. / *Santiago's 1890 plan. Scale 1:5,000. Detail.* Fuente / *Source:* FONDECYT N° 1110684.



ing to the south incorporating the penitentiary and the Campo de Marte, but not the slaughterhouse – an urban infrastructure that will only be represented in Santiago's 1875 plan by Ernesto Ansart. The geometric definition reached by the latter, turns it essential for a plausible approximation to 19th-century Santiago, despite overlapping plan and planning – a fact that renders its reading ambiguous – and introducing views of places and buildings, partially concealing information.

Santiago's most accurate cartographic representation was achieved by the end of the 19th-century: the survey carried out by the engineer Alejandro Bertrand, from whose monumental work only remain Santiago's streets drawings, each one represented individually at a scale of 1: 200 (Bertrand, 1890). Despite its indisputable quality and precision, this drawing was limited to the description of public space, relegating the representation of private properties from which it only states its official line and the point where property subdivision occurs. Private space was detailed two decades later by the Catastro de Manzanas [blocks cadaster] undertaken by the Municipality of Santiago since 1910, in order to estimate an appraisal of properties and collect the corresponding taxes. A precise description of each property in terms of its surface, materiality, and height can be found here. However, given its specific purpose, such cadaster did not collect information from public institutions or from the Church, in which cases the land appears empty. Finally, the Plan of Santiago Valley developed by the Army in 1895, and later redefined at a scale of 1: 25,000, provides accurate information regarding the rural environment (González, 1998, Instituto Geográfico Militar, 2004).

Thus, the achievements of 19th-century historical cartographies on Santiago are relative, showing strengths and weaknesses; nevertheless, they complement and enrich each other. Therefore, the challenge of assembling an urban floor plan of Santiago de Chile circa 1850 – understood as an instrument to specify and expand



on the knowledge of a key moment in its urban development – found in these cartographies an important background material. But at the same time, this implied adopting a working method based on the assemblage of pieces, parts and fragments belonging to different sources: plans, but also iconographic and documentary material. That is why we have called this process a ‘cartographic construction’, since it is about producing a plan that, actually, never existed in its detail (scale 1:5,000) and its wide range framing: the General Cemetery to the North, the De la Aguada trench to the south, the new Women’s Hospital to the East, and the Central Station and the Quinta Normal de Agricultura to the West. This construction was largely developed by articulating the evidence that historical cartographies provided and reciprocally confirmed (Lavedan, 1926; Pöete, 2015).

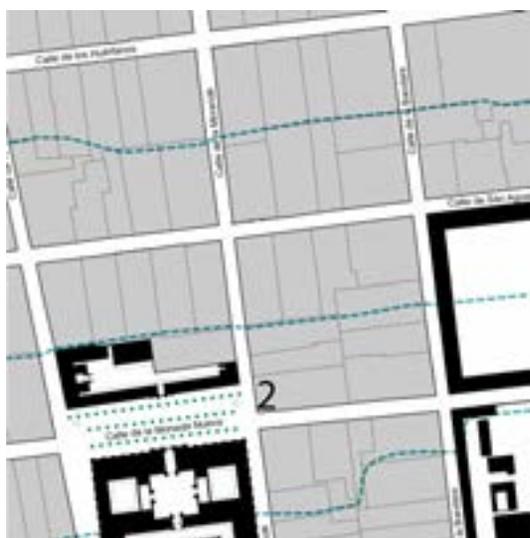
This new plan is based on a double hypothesis. The first one suggests that the plan itself is a methodological hypothesis; since it was built on the deconstruction of 1890 street plans and 1910 blocks, supported by historical cartography, architectural plans, and iconographic material (FIG. 3). The second hypothesis argues that, around 1850, Santiago de Chile was in a phase prior to its republican modernization. This, based on the following evidence: around 1850, Santiago began to grow south due to new water channeling infrastructures after the creation of the San Carlos canal; a set of social, cultural and political institutions settle in the city’s foundational area, establishing through their buildings a new system of urban spaces including parks and squares; in the peripheries the first towns and neighborhoods arise, each with its own formal layout different from the foundational one; finally, the first urban infrastructures occupying sites away from the city are built, with their own scale, morphology and architectural language, unrelated to the models then in vogue.

The evidences supporting this second hypothesis have been key in the definition and construction of the plan, turning it into the space where these dialectical relations are verified: hypotheses that allow articulating evidences and evidences that allow formulating new hypotheses. Finally, due to its ability to describe and select, the instrument that allowed for these relationships to be established was drawing (Solà-Morales, 1980).

In methodological terms, the manufacturing of the plan was organized according to three dimensions: a rural and territorial dimension, an urban dimension, and an architectural dimension.

Firstly, the rural environment and the territorial scale are a fundamental aspect of Santiago’s 1850 plan, given its incidence on urban life. For its definition, the Santiago valley cartographies made by the Army in 1895 and in 1908 were used. Here, the process of dismantling and regression consisted in transforming urban plots into rural ones, for which the 1910 Santiago plan was fundamental (FIG. 4). In other areas, it was only necessary to literally transcribe the information from the Army’s plans, since by 1910 these had not been urbanized yet (as was the case of the northern and

FIG 3C Plano de Santiago de 1850. Escala 1:5.000. Fragmento. / *Santiago’s 1850 plan. Scale 1:5,000. Detail.* Fuente / Source: FONDECYT N° 1150308.



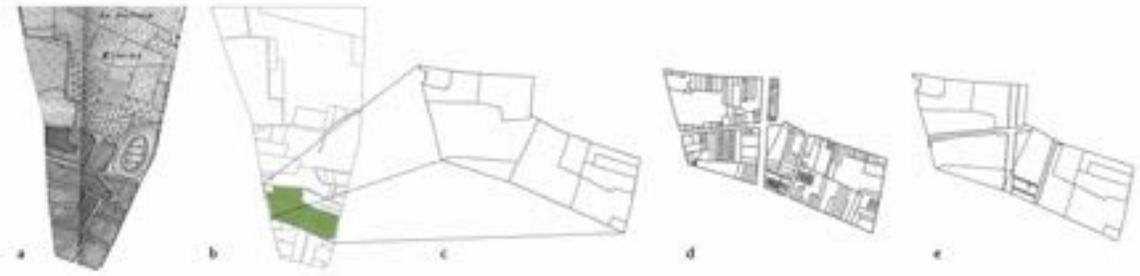


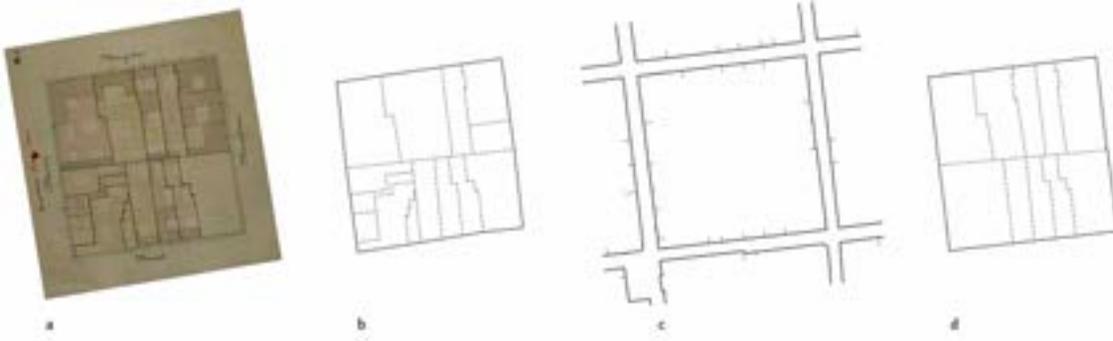
FIG 4 Fases de la construcción del Plano de Santiago de 1850. Dimensión rural. Sector norte.
 a) Fragmento del Plano del Valle de Santiago, realizado por el Ejército en 1895; b) Fragmento propuesto para el Plano Santiago de 1850; c) Polígono de estudio; d) Polígono de estudio extraído del Plano de Santiago de 1910, FONDECYT N° 1085253; e) Superposición de polígonos de 1850 y 1910. Fuente: FONDECYT N° 1150308

Construction phases, Santiago's 1850 plan. Rural dimension. North sector.
 a) *Fragment of the Plan of Santiago Valley, developed by the Army in 1895;* b) *Fragment proposal for the Santiago's 1850 plan;* c) *Study polygon;* d) *Study polygon as extracted from Santiago's 1910 plan, FONDECYT N° 1085253;* e) *Overlapping of polygons from 1850 and 1910.*
 Source: FONDECYT N° 1150308.

southern edges of the city). This led to the definition of rural roads, alleys and different types of property and use of the rural land, creating an unprecedented image of Santiago. Indeed, the plan shows a singular moment of Santiago's urban development: when it ceased to be a small town surrounded by rural areas, as seen in the 1841 Herbage plan, to experience a transference stage between the countryside and the city.

Secondly, the urban dimension implied structuring the plan; that is, defining and adapting the framework of streets and urban spaces for which Bertrand's 1890 street plans were essential. This meant the deconstruction of historical plans, assigning them a key role in the dismantling that led to 1850. The street plans of 1890 undoubtedly offered reliable information regarding the layout and dimensions of streets, which most likely suffered no substantial modification in the forty-year period (1850-1890). In addition to providing information on public space, the street plans showed building subdivision traces by means of the projection, in the official line, of dividing walls and exit points of the *acequias* [irrigation canals] onto the public space. The 1910 cadaster served to complete the information from inside the blocks, thus a sixty-year regression process was carried out. From these pieces of evidence, the proposal for the blocks subdivision becomes, in turn, a new hypothesis (FIG. 5).

Finally, the architectural dimension required adapting the architectural plan of the buildings that housed existent institutions to their corresponding plot and typological and spatial definition. Historical cartography and views of the city played a key role in the adaptation to the plot, material from which evidence was extracted to propose a possible configuration. Plans from different sources were used for typological and spatial definition. From this evidence, each plan underwent a reduction process that allowed synthesizing its typological features, spatial structure and possible programs according to full/empty or figure/ground relations. The homologation process generated by these drawings enhanced the differences and showed the qualities of the new buildings that, located mostly in the countryside – as the penitentiary, the slaughterhouse, the Escuela Normal de Preceptoras, the House of



Orates, or the new Women's Hospital – warned about the nature of the changes the capital was experiencing. The programmatic identity of these institutions was also revealed through this method, by showing sophisticated spatial relationships and complex morphologies. Making all this architecture fit into the plan confirms the shape of the plot and the block or land where it is set, but it also allows representing the city from space continuities (emptiness) and material presences (fullness) (FIG. 6).

Dismantling the image of a unitary and uniform city

Unveiling the general form of 1850 Santiago required distinguishing the new type of architecture and attributes of scale and meaning of the elements and pieces that transformed its colonial space, in search of a geo-historical understanding (Soja, 2008) of urban space and, consequently, of the processes of urbanization and territorial growth. For such purpose, it was necessary to visualize simultaneously the territorial, urban and architectural dimension of the city. This categorization has determined the plan's framing, its readability and the order of its appraisal.

The city and the rural world: towards a mixed territorial order

The dual scenario where the central city and the new urban peripheries are defined (De Ramón, 1985) causes discontinuous urban growth (FIG. 7). However, throughout the process, the order deriving from the foundational grid continued to occupy a central position within the territory. And although the city connected with the peripheral centers, it is clear that torrents, channels, and ditches separated them; such elements explain territorial segregation, but also its mixed condition.

The plan confirms that, three centuries later, the grid is still strongly determined by certain roads that from the beginning linked the city to the territory, along with watercourses and structures for capturing and distributing this resource for popular consumption and agricultural irrigation (Piwonka, 1999). On the other hand, the hierarchy of the roads connecting the different areas – such as San Pablo Street and the road to Valparaíso, Matucana Avenue, Yungay Road, Ollería Street, San Diego Viejo Street, the Alameda de la Cañadilla and the

FIG 5 Fases de la construcción del Plano de Santiago de 1850. Dimensión urbana, ejemplo de una manzana del sector central.
a) Plancheta Catastro de Manzanas de 1910; b) Vectorización de la manzana de 1910; c) Manzana resultante del montaje de planos de calles de Alejandro Bertrand de 1890; d) Manzana propuesta para el plano de Santiago de 1850.
Fuente: FONDECYT N° 1150308

Construction phases, Santiago's 1850 plan. Urban dimension, central area block example.
a) Sheet from the 1910 block survey; b) Vectorization of a 1910 block; c) Block resulting from the assembly of Alejandro Bertrand's 1890 street plans; d) Block proposal for Santiago's 1850 plan.
Source: FONDECYT N° 1150308.

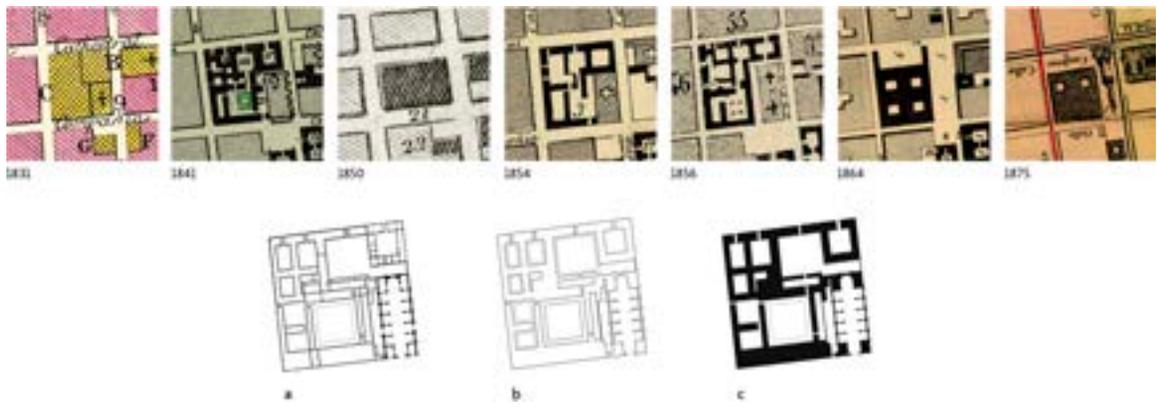


FIG 6 Fases de la construcción del Plano de Santiago de 1850. Dimensión arquitectural; ejemplo, Iglesia de la Compañía. Arriba: Manzana de la Iglesia de la Compañía, en diversos planos históricos. Abajo: a) Manzana vectorizada; b) Manzana con información sintetizada; c) Manzana representada en lleno-vacío. Fuente: FONDECYT N° 1150308.

Construction phases, Santiago's 1850 plan. Architectural dimension; Iglesia de la Compañía example. Above: Iglesia de la Compañía block, in different historical moments. Below: a) Vectorized block; b) Block synthesizing information; c) Block representing full-empty spaces. Source: FONDECYT N° 1150308.

Alameda de la Recoleta, among others – provided the city of an intermediate-scale urban structure.

The nexus between the central city and the territory was somehow articulated by a set of elements, such as the *tajamares* [piers] and their walkway – executed circa 1804 along roughly thirty blocks as a defense for floods – and the enduring significance of Cal y Canto bridge, built in 1780 to connect the neighborhoods of La Chimba with the central sector. Furthermore, the *tajamares* normalized the northern edge of the city and the willingness to regulate the shape of its filling units (FIG. 8).

The northern part of the city, greatly defined by the Mapocho channel and a mostly unbuilt area, presents a certain urban configuration around La Cañadilla and La Recoleta Street, mixed with agricultural areas. Both the Cal y Canto and the Wooden bridges together with the *tajamares*, indicate a desire to urbanize the stream and to connect the central city's grid with the two roads linking it to the territory. These roads integrate also the Blanco Hill and the General Cemetery with the central area. Overall, this reading indicates a spatial disciplinary process of the area called La Chimba, enabled by the installation of the General Cemetery and the subsequent emergence of the Ovalle neighborhood.

A significant contribution in the organization of the urban center was the transformation of the irrigation channel Nuestra Señora del Socorro into an urban walkway, later Alameda de las Delicias in 1820 (Pérez, 2016). In addition, it was extended to the east as Alameda del Carmen, while land urbanization was expanded to the south, and also to the east of the Santa Lucía Hill.

The new urban fabrics located in the outskirts (Yungay village, Ovalle and Matadero neighborhoods) are material expressions of the city's transformation and of new ways of living (Rosas et al, 2016), together with urban pieces such as Quinta Normal, associated to the Escuela Normal de Preceptoras and the School of Arts and Crafts; the Campo de Marte, next to the penitentiary, the Artillery Barracks and the Urban Prison; the General Cemetery and the House of Orates, added to the churches and convents of the sector; and the Railway Station, still a project at the time. All of them represent specific areas of interest that undoubtedly guided the subsequent city's growth (FIG. 9).



The railway line and the Central Station, the westward extension of the Alameda de las Delicias and the perpendicular line called Alameda de San Juan – later known as Alameda de Matucana – connecting to the road to Valparaiso, will play a fundamental role. In fact, given its location, the Central Station would become threshold and gateway to the city, and given its scale and materiality, a sign of modernization and metropolitan attribute. Its articulation with the Quinta Normal and Yungay village, and the extension of almost a kilometer of its maneuvering yard, will establish a new linear border to the west, one which would later become a key part of the railway ring and of the Centennial city's general form. This urban expansion over the surrounding territory must be understood in a broad national policy context, which explains and grounds it. At the time, aware of the territorial scale over which they had to exercise their powers, government authorities commissioned first Claudio Gay and then Amado Pissis to carry out a national territory survey considering, among other things, the railway lines project.

FIG 7 Plano de Santiago de 1850. Ciudad Central y territorio mixto, rural-urbano. / *Santiago's 1850 plan. Central city and mixed rural-urban territory.* Fuente / Source: FONDECYT N° 1150308.



FIG 8 Tajamares del río Mapocho y paseo. Detalle de la vista panorámica de Santiago desde el cerro Santa Lucía, c.1850. Dibujo de E. R. Smith, Litografía de Thomas S. Sinclair.

Mapocho river piers and walkway. Detail. Santiago panoramic view from Santa Lucía Hill, c.1850. Drawing by E. R. Smith, Lithograph by Thomas S. Sinclair.

Fuente / Source: Gilliss, James Melville. *U.S. Naval Astronomical Expedition to the Southern Hemisphere during the Years 1849-'50-'51-'52*. Washington: A. O. P. Nicholson Printer, 1855.

The central city and the intensification of the grid

Around 1850 the regular grid that organized the central city since its founding was preserved within the same borders, maintaining the *acequias* as domestic water distribution networks. It is possible, however, to recognize in the same period several initiatives registered to improve its functioning and urban space, including the opening and rectification of a number of roads, as the fragment of Moneda Street between the current Bandera and Ahumada streets, which contributed to the reform and densification of the central sector.

However, the plan confirms that the central city was still bounded to the north by the Mapocho River; to the west by the Negrete channel, where the central grid *acequias* drained; to the south by the San Miguel canal, draining towards the De la Aguada trench; and to the east by the Santa Lucía Hill. As a consequence, informal settlements emerged in all of its borders, interspersed with the rural area formed by *hijuelas*, farms and plantations where middle-class and underprivileged sectors were located.⁵

In this context, the city's general form around 1850 can hardly still be identified exclusively with the colonial grid and the original site, back when it had a compact and unitary image. On the contrary, in the mid 19th-century, the general form defined a kind of spatial context characterized by the presence of new scattered urban artifacts located in the peripheries, trespassing the limits of the foundational city on its four sides and imbricating urban and rural plots, in a territorial configuration of greater scale, size and complexity (FIG. 10).

The reality of the once identical, uniform city has given rise to a plurality of new urbanizations and buildings throughout the territory that blend with the countryside towards the immediate rural peripheries, showing the abandonment of a model based on the extension and continuity of the grid, a fact that Santiago's 19th-century historical cartography rendered invisible or failed to show (FIG. 1). The plan we present thus reveals the existence of new forms of occupancy developed with a different modulation in terms of urban tissue and, consequently, through modes or mechanisms of rural property market and its transformation into urban plots.⁶

Nevertheless, this process of spatial fragmentation of the peripheries and, as a consequence of the economic boom derived from mining, the central city's form – with clearly defined boundaries in 1831 as shown by Claudio

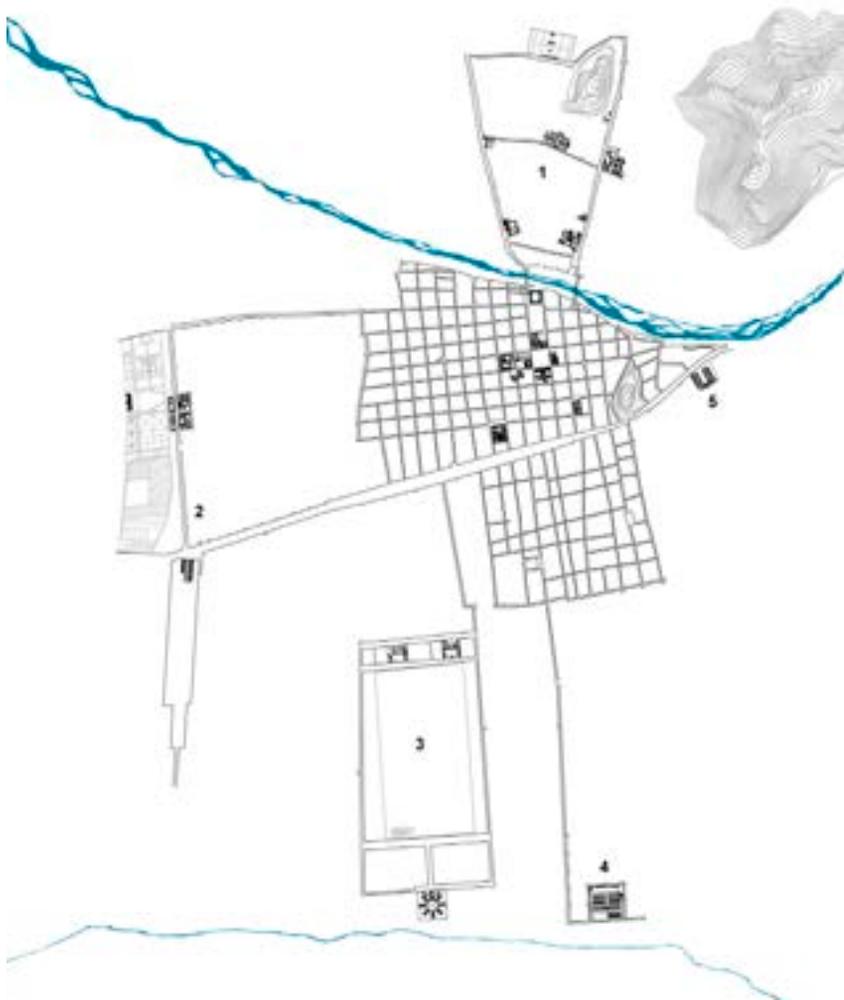
Gay's plan and which Vicuña Mackenna called 'the proper city' – shows the consolidation of the central grid where new public buildings, private residences, and religious buildings densified and intensified land use. In the same period, legal initiatives on the management of the urban form and regulation of urban land use were also developed. Gurovich (2003) emphasizes the order of urban activities by Intendant De la Barra in 1844 and the subsequent Law of Municipalities Organization and Attributions in 1854.

New types and architectural programs

New public facilities that occupied the grid's extension complement the plot subdivision that residential use entailed. Buildings such as the Palacio de la Moneda, transformed into Government headquarters in 1848, the buildings annexed to the Cathedral, Bulnes and Tagle passages, the Mercado de Abastos, the University Theater, the seat of the Chamber of Deputies and the Consulate building as seat of the Senate, among others, drew a spatial net and introduced new programs that involved public space and street structure transformations, constituting themselves as new central places. Along with these buildings, which came to renew the image of the 'palace,' buildings of another kind of scale, program and morphology, coexisted in the distance.

FIG 9 Plano de Santiago de 1850.
Piezas urbanas sobre territorio mixto: 1. Chimba; 2. Quinta Normal de Agricultura; 3. Campo de Marte; 4. Matadero; 5. Nuevo Hospital de Mujeres.
Fuente: FONDECYT N° 1150308.

Santiago's 1850 plan. Urban artifacts on mixed territory: 1. Chimba; 2. Quinta Normal de Agricultura; 3. Campo de Marte; 4. Slaughterhouse; 5. New Women's Hospital. Source: FONDECYT N° 1150308.



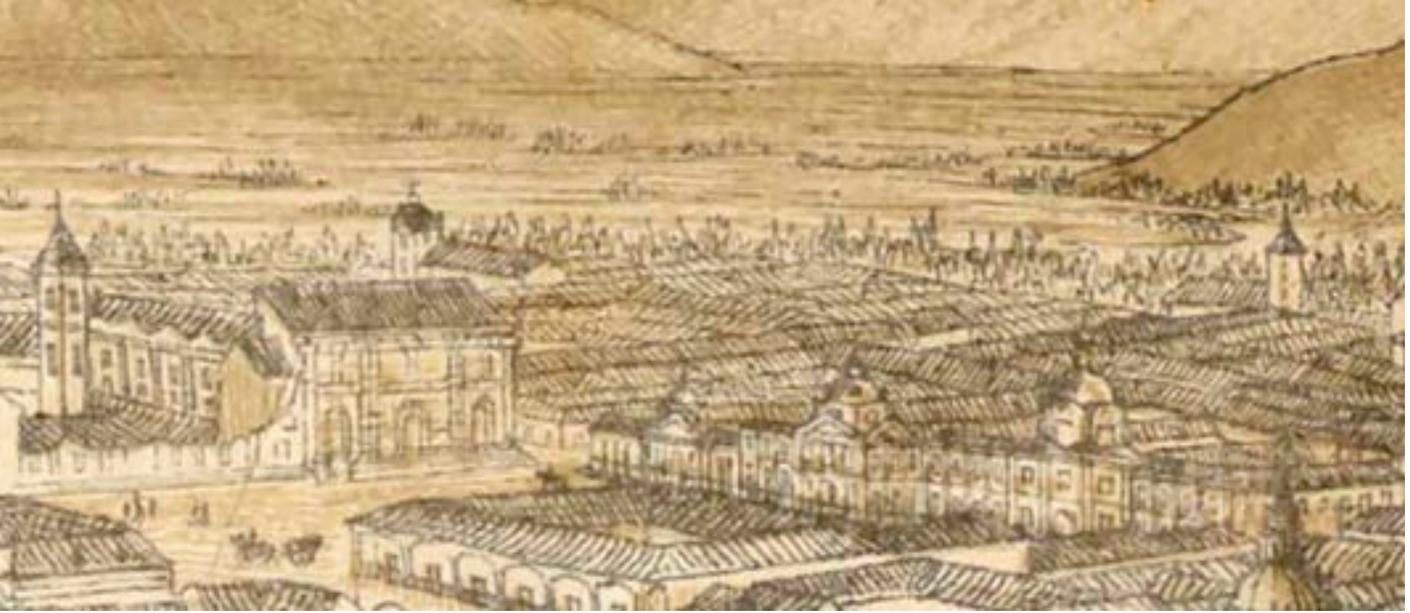


FIG 10 Relación campo-ciudad en Santiago de Chile en torno a 1850. Detalle de la Vista Panorámica de Santiago desde el cerro Santa Lucía, c.1850. Dibujo de E. R. Smith, Litografía de Thomas S. Sinclair.

City-countryside relationship, Santiago de Chile c. 1850. Detail. Santiago panoramic view from Santa Lucía Hill, c.1850. Drawing by E. R. Smith, Lithograph by Thomas S. Sinclair.

Fuente / Source: Gilliss, James Melville. *U.S. Naval Astronomical Expedition to the Southern Hemisphere during the Years 1849-'50-'51-'52*. Washington: A.O.P. Nicholson Printer. 1855.

The central city not only increased the number of buildings but also reinforced the role of urban parishes, adding new churches, chapels and schools. To the existent⁷, the parishes of San Saturnino (linked to the foundation of Yungay village) and Veracruz (under construction since 1852) were added, allowing ordering and re-signifying the triangle formed by the Mapocho, the Cañada and the Santa Lucía Hill.

Together with these new buildings, the city registered microstructures outside its boundaries, whose patterns were no longer governed by the extension of the foundational grid and whose geometry and location constituted changes that anticipated Santiago's definitive modernization – which will happen around 1910 with the celebration of the Centenary of the Republic. Despite their differences with the layout and buildings of the colonial urban fabric, these changes in size and materiality maintain both morphological constants and predominance of a regular order, allowing to state that these were variations of the same ground occupancy geometry on which the city was built in previous stages.

Likewise, the extension of certain streets and the disposition throughout the territory of new buildings comprising public hygiene and policies programs – such as the new Women's Hospital, the General Cemetery, the slaughterhouse, the penitentiary, the Campo de Marte and the Quinta Normal – were the expression of a mixed territory where the urban overlaps with the rural land, and where road infrastructures were the structuring elements in the definition of a new general form.

Conclusions

The production of an urban floor plan has revealed the general form of the city of Santiago circa 1850 in its scope and urban consequences.

First, as an instrument, the urban floor plan has shown new urban scales, allowing for the discovery of new relations between architecture, the city, and its territory – unlike 19th-century historical cartography.

It was the question on how to represent the cumulus of information from different document sources, answered through the method here proposed, which allowed to establish such relationships. In the act of drawing the different shreds of evidence on the plan – already separated from their original sources – a new possible world emerged, re-signifying each one of its parts.

Secondly, the plan displays an unprecedented territorial scale, showing how the city acquired at the time a new condition of centrality reinforced by new institutional buildings of unprecedented scale, typology and architectural language for the colonial order, which not only intensified the grid but also the broad mixed-character territory in which it was firmly embedded. With it, the city built an image in line with the modernization process registered and its status as the capital of the Republic.

This explains one of the main findings that the plan allowed: the urbanization operations carried out on an eminently rural environment that inaugurated a new form of city development. These operations constitute Santiago's first effective growth over its rural periphery, dismantling the image that such growth was a mere extension of the founding city's street layout. On the contrary, the plan revealed that the city's expansion was induced by the provision of programs, buildings and new neighborhoods located away from the central city, defining a distance of 2 to 4 kilometers that allowed, in a single glance, to see the growth that would occur in the following 50 years. In fact, it is precisely with the complexity and expansion guided by these new institutional buildings and towns outside the central city that Mayor Benjamín Vicuña Mackenna will deal twenty years later, seeking to circumscribe and bound it in order to provide it with a general form. **ARQ**

Notes

- 1 The notion of 'general form' refers to the description of a city from the reading and interpretation of episodes that crystallize a certain form, distinguishing between the total and its parts or urban artifacts (Parcerisa, 1986).
- 2 DA VINCI, Leonardo. Town plan of the city of Imola, Italy, 1502. Size: 60 × 44,1 cm. (circumference: diameter 42,2 cm). Scale: 1: 4,300. Rome's plan, denominated *Forma Urbis Romae* and produced under Septimio Severo's mandate, should be considered before this one, since its constitution out of schematic building plans confers it a clear architectural character and of proximity with the reality it represents. On this Rome plan, see the project developed at Stanford University, <<http://formaurbis.stanford.edu/>>.
- 3 Plan of the city of Madrid, Instituto Geográfico y Estadístico, 1872-1874. In: *Cartografía básica de la Ciudad de Madrid*. Madrid: Colegio Oficial de Arquitectos de Madrid, 1979. Scale: 1: 2,000. Coelho's plan of Seville in 1771 must be considered within this type. Finally, there are contemporary cases worthy of attention like the ones from Joan Busquets built inside the *Laborati d'Urbanisme* in Barcelona, Manuel de Solà-Morales in the Catalan regions, and Muratori in Venice.
- 4 Leon Battista Alberti assigns this quality to the architectural representation for the first time (Alberti, 1991).

- 5 During this period, social dwelling was located in the peripheral urban borders, near the main waterways, usually in marshy lands with low agricultural productivity (Hidalgo, 2005). It should be added that in this period, was “the growth of a segmented and segregated city that transformed the bonds between the rich and the poor into industrial services relationships, rather than those of protection and obedience” (Serrano, 2008).
- 6 This way of occupying the periphery and the emergence of new urban forms that the plan shows, as has been widely studied (Romero, 1984, 58-63; De Ramón, 1985), was the consequence of population growth derived from migratory movements originated in the countryside, attracted by the demands of a newly born industry, commercial development and public works, locating themselves in the capital and encouraging the urbanization of farms and rural plots. These new neighborhoods aimed at housing middle sectors, clearly determined by real estate market and state action on rural areas, differed from the lease of pastures where, without greater urban control or infrastructure provision, the most vulnerable sectors were settled, configuring *ranchos* and later *conventillos*.
- 7 Capilla del Sagrario, Church of Santa Ana, San Lázaro, San Isidro, La Estampa, Nuñoa, Renca, Colina and Lampa. The following also emerged as part of this transformation process: the restoration of the San Agustín Temple, the Church of La Viñita, the Church of the Recoleta Dominica, the Church and Convent of the Capuchins, the Congregation of the Sacred Hearts, among others. Worth mentioning is the Convent of the Sisters of Providence, which at the time began to manage its transfer to the eastern periphery of the city.

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