



MAPPING URBAN HISTORY: Belo Horizonte's spatial history through a cartographic approach

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Resumo:

O presente artigo oferece uma reflexão sobre as possíveis contribuições do uso da cartografia para a história, mais especificamente, procura contribuir com um novo olhar sobre a história urbana de Belo Horizonte, em Minas Gerais. A cartografia é aqui abordada tanto com método de pesquisa com base em Deleuze e Guattari quanto prática, no uso de mapas como ferramenta importante para a construção de uma narrativa espacial alternativa. Ao focar na produção histórica do espaço, o artigo traz uma reflexão acerca de entendimentos sobre os conceitos de espaço e paisagem - através de Milton Santos, Henri Lefebvre, Denis Gosgroce, Charles Waldheim e outros - e de como tais categorias podem contribuir para a reconstrução de uma história espacial através da cartografia. Assim, três momentos da história de Belo Horizonte são abordados: sua fundação positivista, a moderna construção da Pampulha e o recente transbordamento sobre o município de Nova Lima, em um cenário neoliberal de pós-mineração.



MAPPING URBAN HISTORY

Belo Horizonte's spatial history through a cartographic approach

INTRODUCTION

The present work aims at fostering a reflection on the intertwinements between Urban History, the Cartographic Method and the Cartographic Praxis - or Descriptive and Interpretative Cartography -, focusing on the possible unfolding emerging from the combination and juxtaposition of those methods and their contribution to urban theories. More specifically, the reflection should contribute on shedding new light on the urban history of Belo Horizonte, Minas Gerais¹.

Recognizing and absorbing the numerous existing narratives about this object, the research puts space in the foreground understanding that (Brazilian) urban history, and consequently its urban theory, is usually told through great facts and acts - if not only on plans - with little emphasis on the space produced and materialized through these actions. Therefore, the first premise of this historical review is to adopt the perspective of space. On that account, such reconstruction should benefit from the cartographic method and cartography praxis, in its potential to shed light on other dynamics and other actors involved in the production of space. Space and landscape are here used as tools for a territorial history that considers not only forms but processes, embedding events, actors, etc.

This paper brings therefore a reflection on the meanings of space and landscape and how such categories can contribute to the construction of a spatial history through mapping. The last section presents an attempt to apply the proposed method, presenting an episodic history of Belo Horizonte's formation in three maps.

SPATIAL HISTORY THROUGH A CARTOGRAPHICAL APPROACH

Space and Landscape

The resurgence on the interest in cartography and mapping is intrinsically, but not solely, connected to what has been called the 'spatial turn' by many authors, meaning the

¹ Additionally, they part of the methodological reflections at the author's present doctoral research.

reawakening of the problematic of space as opposed to the predominant nineteenth century focus on time, transparent in its obsessions on history and progress. The growing insertion of the dimensions of space within social and urban studies is generally considered as a particular expression of postmodernism and its characteristic space-time compression (HARVEY, 1990) and representational crisis (JAMESON, 1991). Underlined in the works of these authors is an appeal for the necessity of new tools with which to better apprehend space and events in space, such as mappings and cartography (SPERLING, 2016) in its many facets.

The shift towards space was announced by Foucault (1997) already in 1967 (in a lecture only published in 1984 as *Des espaces autres*), and was later picked up by geographers and other social theorists such as Denis Cosgrove (1985), Fredric Jameson (1991), David Harvey (1990), Edward Soja (1996) Robert Tally Jr. (2013) amongst others. Since then, the socio-spatial dialectics have become a largely used instrument for architects and urban planners to tackle contemporary urban problems (and the social issues embedded in those) as being able to encompass time-space, geography and history simultaneously while putting the city space at the locus of social change.

Milton Santos has defined space as, amongst many other definitions alike, an inseparable aggregate of systems objects and systems of actions. It is in the interaction between them that lies the dynamism of space allowing for its transformations. While the system of objects provides forms to actions, the system of actions either leads to the creation of new objects or gets realized through preexisting ones. Space is not a thing nor a group of things but a relational reality that involves things and relations together (SANTOS, M., 1988).

In other words, space is a hybrid composed of form and content in which object and action, the materiality and the event should be treated as one. The importance of space relies on the fact that human society is always realizing itself over a material base, the space and its use, time and its use, materiality in its many forms. Therefore, understanding human society implies also the knowledge of the spaces it creates and transforms.

For Santos, the key element that differentiates the notions of Landscape and Space is action; or human life. Landscape can be defined as a material base in which human action has already worked as to transform it, a frozen image in which it is possible to see the previous actions in a holistic perspective. Space, on the other hand, is the landscape added with present actions, a unique situation that only happens in the 'now'. However distinct, space and landscape are for Milton Santos a dialectic pair, complementing and opposing each other, forming a palimpsest in which actions from different generations are superimposed through accumulation and substitution. These dialectic relations between space and action, space and landscape are also present in Lefebvre's understanding of space. What Milton Santos calls landscape, the receptacle of human action through which it is transformed is for Lefebvre treated as 'pure nature'. While Santos defines space simply as landscape added with human life, including fluxes and movements, Lefebvre goes broader considering several categories and levels of spaces, including mental space, the one of plans and ideologies.

But in his understanding of space, Lefebvre goes beyond the binaries of mental and physical space consolidated by philosophers and mathematicians. In 'The Production of Space' (1991, first published in 1974 as *La production d'espace*) he introduces the third term: the



social space, which is different from both. For him, there was, hitherto, in philosophy mainly, a large gap between the 'ideal' mental space and the 'real', lived in space. For overcoming that, he calls for a *science of space*, which must provide a true knowledge of space and the processes involved in its production, rather than mere descriptions of spaces that exist in their physical reality or generating discourses on spaces. Social space, for him, is not a mere aggregate of things, pure form, and it is also not only their content and symbols. Space is defined by Lefebvre as social because it "implies, contains and dissimulates social relationships - and this despite the fact that a space is not a thing but rather a set of relations between things (objects and products)" (ibid, p. 83). The reality of social space is, therefore, at once formal and material.

The city is considered by Lefebvre as a social product once it is produced by people or groups of people, gradually and not at once. Even if a city is planned, like Belo Horizonte, it might at times be still considered a product and not a work of art, because its concretion is not instantaneous but gradual. But the separation between works of art and products is not a radical one. Lefebvre has pointed to the dialectical relationship between them, in which works are inherited to products and products are not necessarily all about repetition, having the possibility of being unique, like works of art. A social space can be, simultaneously, work and product, as the materialization of 'social being' (ibid, p. 102).

Understanding space as alive, as a locus of action, process and transformation, implies automatically the consideration of time. Time is, of course, an indispensable category besides space, object and action if what we are most concerned with are the processes of productions or, how actions meet objects, transforming them. In the meeting of time and space, one finds the notion of the event. The same idea is found in other texts using different vocabularies. Lefebvre talks about a *moment*, which is related to a possibility to be realized. Bachelard speaks about '*instant*' and Whitehead of '*occasion*' (SANTOS, M., 2002, p. 93). For Santos, the event is an instant in time realized in a point in space. They can be in the past, as a complete and finite reality, or be situated in the future, as a supposition. More importantly, events are unique situations, and never repeated; they are absolute. This absoluteness is what renders the efficacy of the event in their (spatial) transformative character. Although most of the times the event means human action, they can also mean ideas and not only facts. Events are also never isolated but belong to systemic ensembles. They can be diachronic, happening in succession throughout time or synchronic, coexisting in several places at the same time. This is, for example, the case of State action, where a determinate law can act upon a totality of people, institutions or territory simultaneously. Supported by Whitehead (1938, p. 255 *apud* SANTOS, 2002, p. 106) Santos affirms that each event has two simultaneous levels of existence, the global and the local, and that no event can be wholly and solely the cause of another event. He explains: one event causes the other through the universe, intermediated by totality, according to totality. Therefore, one must not analyze the event separately, but within the totality in which it is inserted, the succession of events, both globally and locally. Each event is at once a result of the global and the local simultaneously.

The category of the event will be key to understand, in the history of Belo Horizonte, how each event, and their systemic ensembles, has acted in the transformation of space, considered as both action and idea, physical and mental, applied upon given point in space in



a given point in time. Each event will not be treated individually, but instead, it will be expanded the chain of events proceeding each main event and also being generated by it.

In the recent decades, the concept of Landscape has acquired new meanings in the field of urbanism, understood, for some, less as a category and more as a tool. As we know it, landscape is not a new idea, dating from the Renaissance as reminded by the geographer Denis Cosgrove (1985, p. 46). It has however lately become a meeting ground to geographers, biologists, artists and sociologist with architects and urbanist that start moving their attention beyond the city, seen the increasing fragmentation of urban tissues along with the dissolving of long-standing dichotomies such as rural and urban, nature and culture. In the 1970s Henri Lefebvre (1999) referred to this phenomena as the simultaneous implosion-explosion of the city. It implodes (internally) breaking into disconnected fragments, and it explodes (outwards) in small detached pieces, spreading heterogeneous forms of urbanity across the rural landscape. Terms such as *Cittá diffusa* (SECCHI, 2012) have emerged in the attempt to conceptualize this fragmented and heterogeneous urban form and, mostly, to categorically separate it from the modern city and the ones preceding. Interested in understanding the social production of urban space in North-American cities, Mark Gottdiener (1985) treats the phenomena as “deconcentration”, acknowledging that neither conventional - or, according to him, mainstream - or Marxian politico-economic approaches which focused on the dominance and hierarchy of historical city centers were adequate to deal with the new nature of urban form. Such new meanings and applications of Landscape are inserted in the many attempts to find new methods to approach this complexity.

It is within this context of the de-industrialization of North-American and European cities, parallel with a radically decentralized urbanization increasingly characterized by horizontal sprawl and rapid change, that Landscape is presented as a model of contemporary urbanism uniquely capable of describing - and I add, acting in - such conditions (Waldheim, 2006, p. 37). Extrapolating the limits of what we used to know as “urban”, landscape can also incorporate issues of water, agricultural production, ecology and even mining to the urban problematization. In addition, landscape presents itself as “a medium, as it has been recalled by Corner, Allen and others, uniquely capable of responding to temporal change, transformation and adaptation and succession” (ibid, p. 39).

These recent notions and applications of Landscape are not radically different from Santos' simplified idea of it, as everything that the eye can reach. However, Landscape Urbanism as a tool emphasizes two important implications that will be crucial to the sort of approach this paper proposes. Firstly, it goes beyond the focus on urban form – spatial arrangements of streets, typologies, functions - and is capable of embracing also large infrastructures, under and above ground, natural resources and ecology as well as social practices which have been so determinant in the history of Belo Horizonte. Serving as interface between nature and culture, Landscape Urbanism is an integrating discipline through which to examine the territory: a product of the interaction between human and natural processes. It therefore no longer refers only to garden planting or pastoral scenery but embraces fields such as urbanism, infrastructure and spatial planning alongside more known themes of nature and environment. Grounded on a global environmental awareness, Landscape Urbanism promotes the encounter of large-scale infrastructure - such as mining - to its surrounding territories in order to find compatible solutions. Secondly, the wide temporal dimension of

landscape projects the territory as a medium of continuous ongoing exchange, particularly relevant for historical analysis.

The lens of landscape will be therefore used as a mediator to analyze the historical relations between agriculture, mining and urbanization in the territory of Belo Horizonte. Hence, such relations shall be seen in a historical perspective and also examined in the contemporaneity.

Cartography as storytelling

This predominant role given to space and cartography clearly is not anything new, having its most significant moment dating from Renaissance. It is no coincidence that the emergence of cartography is aligned with the period of the great navigations and, with the discovery of the Americas, a complete change in space perception and world-view. At the same time, the development of the linear perspective and measurement tools installs a new relation between the subject and his/her perception of space, through the possibility of the individual gaze (TALLY JR., 2013). It is also not coincidental that the same period witnesses the emergence of the ideas around Landscape (COSGROVE, 1985), another key concept for this thesis which, as much as cartography, goes hand in hand with space apprehension and representation.

Digging into the history of cartography the geographer J.B. Harley has shown us, in *'Deconstructing the map'* (1989), how maps are not mere representational tools, but in fact act as instruments of power and authority relations. With cartography, it becomes easier to draw lines on territory and therefore claim possessions. In the early history of colonial Brazil, orthogonal lines have been drawn on maps attempting to organize and distribute possessions but in fact rarely corresponded to ground reality. Although having been dissolved with time, their representations still figure in Brazilian collective memory as part of our colonization and domination histories. The most remarkable are the *Tordesillas Treaty*, theoretically dividing Portuguese and Spanish territories along a meridian line, and the *Capitanias Hereditárias* splitting the Brazilian territory into privately owned horizontal strips departing from the coast. But the mismatch between maps and reality did not remain in a remote past where survey technology didn't match the enormity of the territory. As the author has also pointed, "it is still easy for bureaucrats, developers, and 'planners' to operate on the bodies of unique places without measuring the social dislocations of 'progress'. While the map is never the reality, in such ways it helps us to create a different reality" (HARLEY, 1989, p. 167–168) Therefore, by recovering and redrawing Belo Horizonte's historical maps, this article aims not only at dismantling the objective reality coat currently covering them, but also to create different realities with the combination of other sources of mapping offered by transversal narratives. As Robert T. Tally has observed, "[t]o draw a map is to tell a story, in many ways, and vice-versa" (2013, p. 4).

While Foucault is exemplary of the comprehensive mapping of power/knowledge relations in space, faithful to the engagement to 'spatial relations in relation with cultural and social theory', the cartography proposed by Deleuze and Guattari in *A Thousand Plateaus* (1987) takes distance from the associations with space and is more tuned to the other



important post-modern turn: the crisis of science (SANTOS, B. D. S., 1995). In line with other French philosophers, their cartography is a symptom of the refusal of modern sectioned and reductionist science characterized by the search for the totality of the world by the examination of the fragment. Instead, the post-structuralist approach proposes to tackle complexity by embracing multiplicity and, as defended by Latour (2005), through uncertainties and contradictions.

In their seminal work, *A Thousand Plateaus*, Deleuze and Guattari strongly deny any form of binary logic, that of the root-tree, which, according to them, is unable of understanding multiplicity (ibid, p. 5). In that sense, the authors develop the idea of the rhizome, a term borrowed from biology, meaning a root system without any hierarchy, nor pivot. "There are no points or positions in a rhizome, such as those found in a structure, tree, or root. There are only lines" (ibid, p. 8). Unlike the tree, the rhizome connects any point to any point, has no beginning and no end.

Connecting the ideas of rhizome, multiplicity and assemblage, the authors propose therefore their principle of cartography: "make a map, not a tracing" (ibid, p. 11). While the tree logic is the one of tracing and reproduction, the map is like a rhizome, having multiple entryways, always detachable, connectable, reversible and modifiable. Cartography is therefore always conceived as an open map, a method to approach the subjectivities understood in its processual dimension. "Its following a process and not an object" (KASTRUP, 2008, p. 469) For a moment, the persistence in contrasting the rhizome to the tree, mapping to tracing, the bad and the good side might seem to revert to the dualism to which they so strongly oppose. On the contrary, the authors defend a constant movement between the tree and the rhizome, the map and the tracing. They explain: "It is a question of method: the tracing should always be put back on the map (...) It is inaccurate to say that a tracing reproduces the map. It is instead like a photograph or X-ray that begins by selecting or isolating, by artificial means such as coloration or other restrictive procedures, what it intends to reproduce." The tracing would be therefore the translation of the map into an image, organizing the multiplicities and structuring the rhizome. It performs as to reproduce the impasses, blockages and points of structuration of the rhizome and might be dangerously reproducing only itself instead of the map of rhizomes, propagating redundancies.

Reflecting on the implications of this new approach to the cartographic method on the tools commonly used in urban studies, it seems to suggest that we avoid any form of graphic representation, or tracing, for its dangers of crystallizing processes, inserting blockages and interrupting lines of flight. Should we then, abandon the practice of drawing maps, so long associated with spatial analysis and design? The landscape architect James Corner does not believe so. In his influential essay "The Agency of Mapping: Speculation, Critique and Invention" (1999) Corner picks up precisely from Deleuze and Guattari statement "Make a map, not a tracing" to argue for the crucial agency of mapping practice in not only reformulating what already exists but revealing and realizing hidden potentials. Mapping gains therefore a projective dimension, "first employed as a means of 'finding' and then 'founding' new projects, effectively re-working what already exists" (ibid, p. 222). By being essentially a visual apparatus, maps have the unique ability of providing a visual projection of things otherwise only imagined.



Also for Waldheim (DESIMINI; WALDHEIM, 2016) cartographic praxis has a great projective potential as “a representational project that merges spatial precision and cultural imagination”. He regrets that the ascendance of “mapping” and data visualization has privileged abstract forces and flows, moving the trajectory of representation from physical description of ground conditions toward the depiction of unseen, immaterial forces. For him, this tendency is related to the association of plans (or maps) to “masterplans”, seen as static and antiquated, incapable of dealing with complexity and dynamic relationships. Instead, he sees cartographic practices as a necessary grounding, as a mean to recognize the spatial qualities of the earth, complementing systemic diagrams representing social, economic and political forces. Agreeing with Corner, he states that “mapping is no longer thought to be a tool for description or representation, but rather as an instrument to produce ideas and actions”. (ibid, p. 17)

Although the discourses of Corner and Waldheim argue mainly for the use of mapping as a tool for design practice and therefore for imagining new possible futures, the same practice might also be used retrospectively as a way of reinterpreting spatial history and unveiling hidden realities. Therefore, a re-tracing and re-mapping of Belo Horizonte’s historical cartography, layered with narratives, processes and actions, should try to reveal the rhizomatic complexity of space production, considering also actors and agencies involved.

Milton Santos’ movement between landscape and space, which for him meant a movement between the frozen and the dynamic, can be directly related with movements of tracing and mapping suggested by Deleuze and Guattari. Combining both perspectives we see that, while tracing produces only a portrait of a frozen moment in landscape, mapping means to cartograph space, including actions, human life, social dynamics, economy, values, etc. It is necessary therefore to travel between the movement and the static, from landscape to space and vice-versa.

Our focus on materialities owes to the fact that, as Latour (2005) has observed, (urban) objects might become particularly visible when they are object of controversies, when they are in movement and when they become the centre of actions, discourses and counter-actions. Therefore, the urban materials, as the crystallisation of moments of territorialization and deterritorialization, become the trigger for the understanding of the alignments between humans and non-humans producing the city². In the urban studies field, such alignments have been termed as ‘assemblage’, one of the many conceptual unfolding of rhizome and agency coming from Deleuze and Guattari and from Latour’s ANT. Such concepts allow a double gaze on the material and the social, allowing to reveal, through the ‘things’ the processes involved in their making. However, the criticism offered by Brenner et al (BRENNER; MADDEN; WACHSMUTH, 2011) on the assemblage-thinking and its focus on urban objects alerts for the dangers in underestimating the political-economic forces acting in the city, as the accumulation of capital, the issues on land property, exploration, power, inequalities, etc. In contraposition, the radical critique of Latour arguments that such “social forces” are not enough for explaining the durability of such hierarchies and social asymmetries.

² the approximations of cartography with Latour and the ANT have developed into the concept of the ‘cartography of controversies’ (Venturini, 2010) which should not be confused by the cartographies explored in this research as it has very different aims and techniques.



It becomes therefore urgent to reveal how spatial and social asymmetries are constructed and, therefore, which are the objects, instruments and actions contributing historically for the continuous and ceaseless perpetuation of this differences. One of the hypotheses of our research is that, however the transitorily and ephemerality of the urban gestures, they act as to reproduce long living politic-economic relations of accumulation and exclusion, territorialized and often crystallized in urban tissue. They become therefore visible through their tangible materially. Observing and reinterpreting them should benefit highly from both cartographic method and praxis.

In this article, the appropriation of Deleuze and Guatarri's (1988) ideas of rhizome, plateau and cartography will be two-fold. Firstly, it shall de-hierarchise sources, images, maps, narratives, all to be considered as truthfully equal testimonies of urban histories, besides more traditional academic bibliographical references. Secondly, we will use interpretative and descriptive cartography combining topographies, topologies, events, laws, praxis and narratives through a careful work of selection and isolation in order to project new histories and possibilities of interpretations. The dialectic move between maps, tracings and texts is also a move between materialised urban form and processes, which is our main focus. While focusing on objects and form, we are instead trying to capture the essence in processes, or the set of relations that are involved in its construction. Therefore, we will target first at the crystallised urban form in order to actually grasp performance, traveling between tracing and mapping, as Deleuze and Guatarri have suggested.

WHY RE-MAPPING URBAN HISTORY

As we know, History - with the capital H - is always told by the victorious, therefore from the centre, while small histories from the periphery are shadowed. Under the modern scientific paradigm, the (spatial) History of Belo Horizonte has been told mostly through the perspective of its plans and great acts. As such, many historical overviews have focused on the urban form proposed for the city, searching for its premises or failures.

The approach through mapping shall allow moving away from the fixed image of the Project as the main generator of planned cities while reinserting other forms of narrative in its spatial history. The proximity of narrative and mapping has been elaborated by Tally Jr:

"Sometimes the very act of telling a story is also a process of producing a map. And this operates in both directions, of course: storytelling involves mapping, but a map also tells a story, and the interrelations between space and writing tend to generate new places and new narratives. (TALLY JR., 2013, p. 46)

As Lefebvre has put it, a long *history of space* - considered by him as neither subject or object, but a social reality, and, in consonance with Milton Santos, a set of relations and forms - "is to be distinguished from an inventory of things *in space* (...), as also from ideas and discourse *about space*. It must account for both representational spaces and representations

of space, but above all for their interrelationships and their links with social practice.” (1991, p. 116)

In a recent publication Paola Berenstein Jacques and Fabiana Dultra Britto (2017) call attention for the survival of urban gestures which resurface in other times to haunt the city, be in material form or memory. For them, revisiting this “complex game of *temporalities*, of different forces between past and present, between the ‘occurred’ and the ‘nows’, through synoptical montages of heterogeneous times still surviving in the cities, forces of the past reemerging on the present (...) as flashes and sparkles of involuntary memories” (2017, p. 14) means also to bring light to the “blind fields” of Lefebvre (1991). For him, blind fields exist when reading the present with the eyes of the past, for example (mis)reading the Urban age using the rationalities of the Industrial Age. In the opposite direction, what could we gain, instead, by reading the past with the eyes of the present? Or, how might contemporary urban theories bring new light to the past, or to urban history?

A deconstruction of a consolidated history becomes even more urgent if seen under the light of post-colonial thought. Searching for the construction of a Latin-American architectural historiography, the Argentinian historian Marina Waisman claims that there is a distortion between the historical reality which serves as the basis for the elaboration of concepts and the later application and exploration of such concepts in the countries marginal to the centres of intellectual production because, in general, the concepts used as instruments for the exploration of realities where elaborated from other contexts, the ones of the central countries (WAISMAN, 2013, p. 42) This mismatch between concept and reality was also felt by Ananya Roy while doing research in Calcutta (2015), where she noticed that the concepts of urban theories used in central countries did not fit the reality she faced in the field. From this acknowledgement, the author questions if the dominant cultural theories are adequate for explaining those places on the map that seem marginal and different and how urban theory can explain places like Calcutta. Recognizing a mismatch between the dominant theories and the reality found, Ananya Roy proposes, therefore, the construction of new geographies of theory, meaning, the production of theories from the “global south” as a possible way of reconcentration of critical urban theory. According to the author, post-colonial theory allows thinking in a relational manner about cities. Relational thinking finds resonance in the idea of rhizome, representing a denial of the tree-root structure as it demolishes centre-periphery relations.

Equally, the history of Brazilian cities and urbanization shall not be read and repeated from the universality of history, underlined by the linearity of time embedded in ideas about progress, but instead from its own geography and its own temporalities, by use of relational thinking, as defended by Ananya Roy. Such notion opens the way for anachronisms and *heterochronies* which, on urban space, are found under the form of “coexistences of different times in the cities, non-pacified coexistences causing strangeness, conflicts, shocks.” (BRITTO; JACQUES, 2017, p. 298)

But the deconstruction and the re-telling of the history of the city faces the following deadlock: the disappearance of the non-dominant, non-homogenized, heterogeneous narratives. A possible solution is found on the mapping of materialities, of crystallized urban objects, especially when they become the object of confrontation and debate.

In the words of Margareth da Silva Pereira

“It is in relation to the ephemerality and precariousness of life in its immanent character that each construction, and particularly architecture, stands as a gesture which ambition is to be a form of resistance and transgression. As a desire and possibility of transcendence, duration and permanence. (...) A mix of constructions more or less conscious of its stubbornness, the city, in its materiality can be read as a cartography of those successive and juxtaposed gestures” (PEREIRA, 2017, p. 151).

According to the analysis of Marina Waisman, in our countries, the *longue durée* elements are not in architecture but in urban tracing, in the urban vocation and in the life of the streets (Waisman, 2013, p. 82). Therefore, the reading of urban forms and social practices, not only architecture, might aid to produce other narratives, constructed from a specific point in the map, as argued by Ananya Roy.

In urban history, it is not enough to portray a certain landscape in a specific moment in history but is equally important to be able to grasp the processes involved in the formation of this landscape, considering it as a space in which human action is in place. The analysis of three different episodes in the history of Belo Horizonte aims at grasping actions and process around a specific event that have triggered profound transformations in the city dynamics. The event is here understood through Milton Santos, as a marriage between time and space, in which one action can trigger an avalanche of other actions and reactions which result in spatial transformations.

THREE EPISODES, THREE MAPS

In order to build one of the many possible reconstructions of Belo Horizonte's spatial history, this article navigates through important events that have contributed to shaping the city's materialization while reconstructing its cartography. Three special events have been selected for representing important urban gestures which have materialized in crystallized urban form and will be represented and analyzed through maps. They are: (1) the foundation of the city in 1895; (2) the emergence of its first satellite settlement in the 1940s triggered by the construction of a dam and lake formation, Pampulha; (3) the sprawl towards its neighbor Nova Lima triggered by a post-mining scenario, changes in urban regulation and inaugurating new forms of urban life.

Each one of these episodes is usually seen as an individual moment in Belo Horizonte's urban history, each having its particular motivations, inserted in different contextual realities. They are rarely seen within the same narrative, through the same set of lenses. A focus on space through the mapping of spatial formation processes functions as a sort of filter that aids to grasp mainly specific social relations with a direct result on physical space. The method thus eclipses, even if temporarily, particular social relations that have not directly materialized on space, putting them in the second plane. A focus on space and mapping allows also to see not only spatial forms but complex landscapes in transformation. Although producing three

different spatial forms, we will see that the three episodes have very similar attitudes towards ground manipulation, grand infrastructural works and lastly, social segregation.

The episodic essence of this narrative requires making large jumps in time and space and, knowingly, leave many things unexplained behind. Although attempting to reveal untold stories on each historic moment of the city, the we acknowledge the impossibility of producing a holistic history, and in fact we don't intend to. The micro-histories here told through maps are a result of an extensive work that goes back and forth in bibliographical as well as archival historical research and mapping, between narrative and image, between tracing and mapping. What emerges from each map and its following text are fragments of histories which have, through a non-systematic rhizomatic approach towards diverse sources, been compiled and translated momentarily to fixed representations. Such representations try to depict more than space, but mostly spatial processes and socio-spatial relations, "with the inhabited (or appropriated) space functioning as a sort of spontaneous symbolization of a social space" (Bourdieu, 1999, p. 124). This approach and the limited space of this article means also that many facts and details will be pointed very punctually but remain unexplained. The idea is to tell a history from the maps and the several sources that were used to compose it.

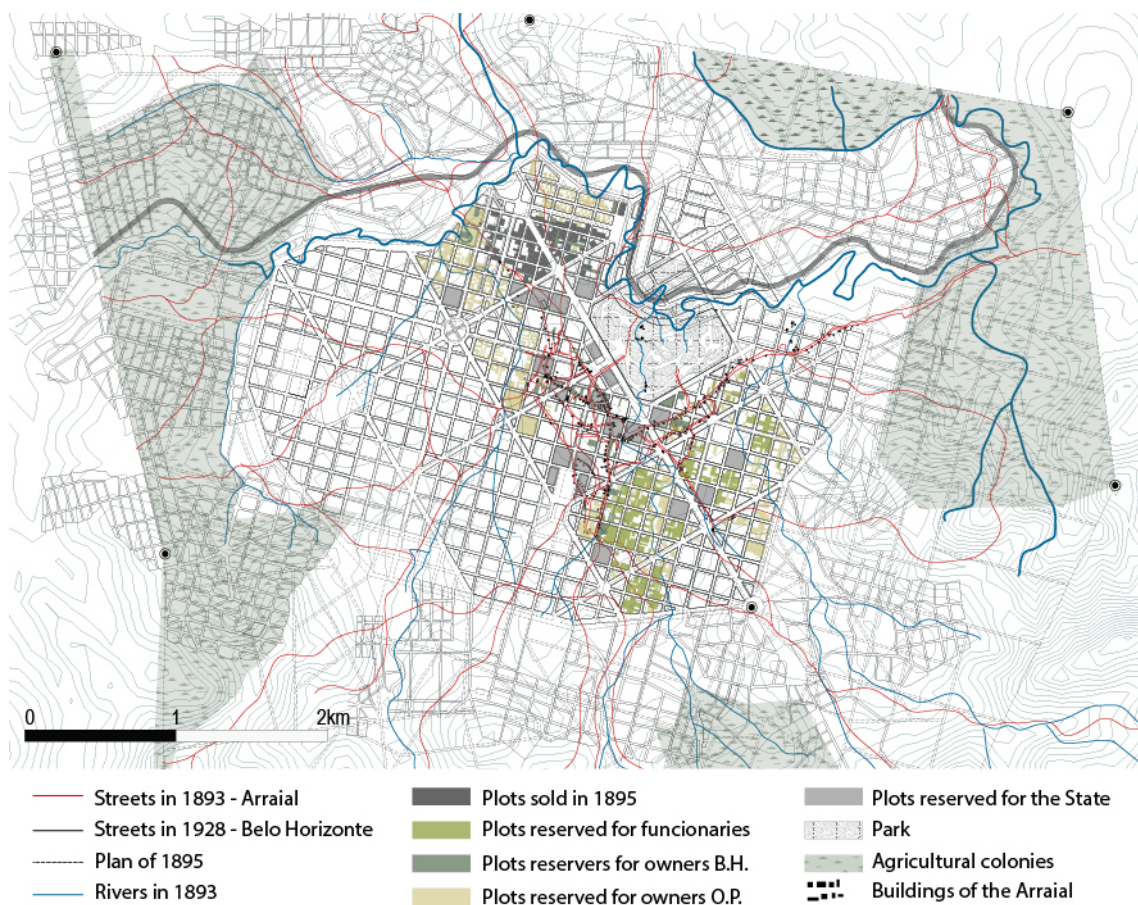
Map 1 – Foundational core (1893-1928): intertwined co-existence

Naturally, as a planned and therefore drawn city, all facets of cartography - sketching, mapping, surveying, planning - have had a protagonist role in Belo Horizonte's history, since before its foundation. The 1895 plan drawn by Aarão Reis figures in almost every historical account of this city. As its image has consolidated as a symbol of its existence, the imaginary projections have overshadowed its real ground conditions, deleting simultaneously its past and future while enhancing the *tabula rasa* illusion. In this process, at least three other important plans are largely ignored: the one of the demolished preexistent village; the plan of the agriculture colonies established simultaneously to the capital; and the cadastre map of 1928-9 (BELO HORIZONTE, P. DE, 1929). All of them inform us of contrasting ideas to the ones embedded in the fixed and most perpetuated image of the 1895 plan.

The present map was produced from the retracing and selection of information from several historical maps. A detailed cadastre map of the *Arraial de Bello Horizonte*, the village totally demolished for the construction of the Cidade de Minas (the capital later renamed Belo Horizonte) was drawn by the Construction Commission (*Comissão Construtora da Nova Capital – CCNC*) in 1894 (NOVA CAPITAL, 1894), registering all properties and buildings to be expropriated and demolished. As the same referential nodes were used in the topographical surveys and in the Aarão Reis' 1895 plan for the city (NOVA CAPITAL, 1895), the superimposition of plans was possible, with reasonable precision. The visual result reaffirms us of facts already exposed in the city historiography, for example, that the *arraial's* main church, *Matriz*, used to be exactly in the block where another church was built, *Igreja da Boa Viagem* (BARRETO, 1996). But other less known relations are also exposed: part of the Avenida Afonso Pena, Belo Horizonte's main axis, runs in parallel to the old Rua Congonhas, accessing the *Arraial* from the south. Avenida Brasil, which starts from the Praça da Liberdade and extends towards the suburbs to the northeast, is in the same direction of, and probably



superposed to, the Estrada de Sabará, connecting the capital to the municipality it once belonged.



Source: by author with data from: historical maps available at APM and APCBH.

Another important layer of this map comes from the “*Planta da parte urbana da Cidade de Minas designada para 30.000 habitantes*” (Plan of the urban part of Cidade de Minas designated for 30.000 inhabitants, MINAS GERAIS, 1895), elaborated by the Construction Commission already in 1895, as plots began to be sold. As prescribed by the Law n.3 Additional to the Constitution, of 1893 (REIS, 1893), which determined the transfer of the capital to Belo Horizonte, a plan would be elaborated for 200.000 inhabitants, but only a section of 30.000 would be built within the timeframe of four years, hosting the necessary public equipment. The law also prescribed the manner in which plots would be distributed: some reserved for the state for public buildings, hospital, schools and for future occupation, some conceded for state functionaries, for former owners of Ouro Preto, - as a compensation - and others to former owners of the *Arraial*, exchanging with expropriated properties. The rest would be sold in public auction. This map shows therefore the plots already reserved and sold in 1895. Some interesting conclusions can be drawn from this visualisation. The majority of plots sold by this date are concentrated in what was called the ‘commercial zone’, in a lower area next to the Rail Station. This area was the first to be levelled and the first to be put on



auction (LEAL, 1895). In this area, the blocks have a different shape from the others inside the urban zone, being rectangular and smaller, having smaller plots more adequate for commercial use. The middle section of the strip built for 30.000 inhabitants is the one with less plots reserved or sold. The superimposition from the plan of the Arraial shows as the probable reason. When the plots began to be sold, the old village was not yet demolished and many of its houses were used by the commission and its engineers (BARRETO, 1996). This suggests a co-existence, for a timeframe of at least a few years, of the old village, before demolition and erasure, and the new modern city in construction. The southern edge of this strip is the area with the most concentration of plots reserved for functionaries, the *Bairro dos Funcionários*. This area is also the higher in topography and became the most valued over time. Today, it is one of the most valued part of the city, together with the Bairro de Lourdes, which occupies today the southwest corner of the urban grid, the last to be urbanized and occupied.

Beyond the grid of the Urban Zone, outside Avenida do Contorno, is the suburban zone, which mesh has been here drawn according to the city cadastre map of 1928-29. Underneath, in dotted lines, it is possible to see Aarão Reis original design for this zone. His descriptions of the plan (BARRETO, 1996) mentions only that this zone would have narrower streets of 14 metres, which would accommodate better to topography. In fact, in his design, the streets are not disposed in the same rigidity of the Urban grid, but when overlapped to topography one can see clearly that it has not been a guiding principle either. The suburban mesh shows no hierarchy of streets, which sometimes meet at nodal points, suggesting a sort of centrality desire, however without monuments or public buildings. When comparing to the pre-existing roads (in red) and to the rivers, we can see that occasionally the suburban streets follow their logic. When comparing to the suburb cadastre map of 30 years later, we can see that in fact those are the only streets which coincide with the plan of 1895, not because they followed design, but because the design followed pre-existing structures. It is the case for example of what is today the Bairro Carlos Prates, between Avenida Dom Pedro II and Rua Padre Eustáquio. Although in this cartographical reconstruction the paths don't coincide perfectly – it is an impossible task when dealing with historical maps without the satellite technology of today –, the old road and the river *Córrego do Pastinho*, today covered by the avenue, are witness to the geographical condition which has induced the opening of streets, in the same concave shape, following the valley and the river. Not coincidentally, this is one of the few regions where the built coincides with planned in the suburbs and is also one of the first suburban areas to be occupied, while the city centre was still being built (BARRETO, 1996).

Another important layer in this map is shown by the large areas in green, apprehended from the “*Planta dos Terrenos Demarcados para a Fundação da Cidade de Minas*” (Plan of the land demarcated for the foundation of the Cidade de Minas), organized by virtue of the Decree 1127 of 6th December 1898, discriminating the urban, suburban and colonial zones. At the same time as the city was being inaugurated, agricultural colonies began to be implemented around the city, as a part of a State project of agricultural development associated with the importing of foreigners, especially from Europe³. The map shows four of these colonies, Carlos Prates, the largest to the west, Córrego da Mata (later renamed Américo Werneck) to the north, Bias Fortes, to the east and Adalberto Ferraz, in the south. Their implementation,

³ See AGUIAR, 2007 for a detailed account.



planned and undertaken by the State, goes in the opposite direction of the plans of Reis, who had designed this area as a suburban zone, separated of its surrounding a rural zone. The limits of such colonies follow, not Reis design, but two principles: the areas already expropriated and now belonging to the State and landscape. Their land subdivision was organized as long strips in parallel to the river, providing water supply for agricultural purposes. Comparing to the map of 1928, it is possible to see that the urban mesh developed goes in fact in many cases according to the agricultural and hydrological, structures and not to Reis plan. This is very clear in the Colonia Carlos Prates, to the west. In the northern areas, the urban development is a result of the subdivision of these long strips parallel to the river.

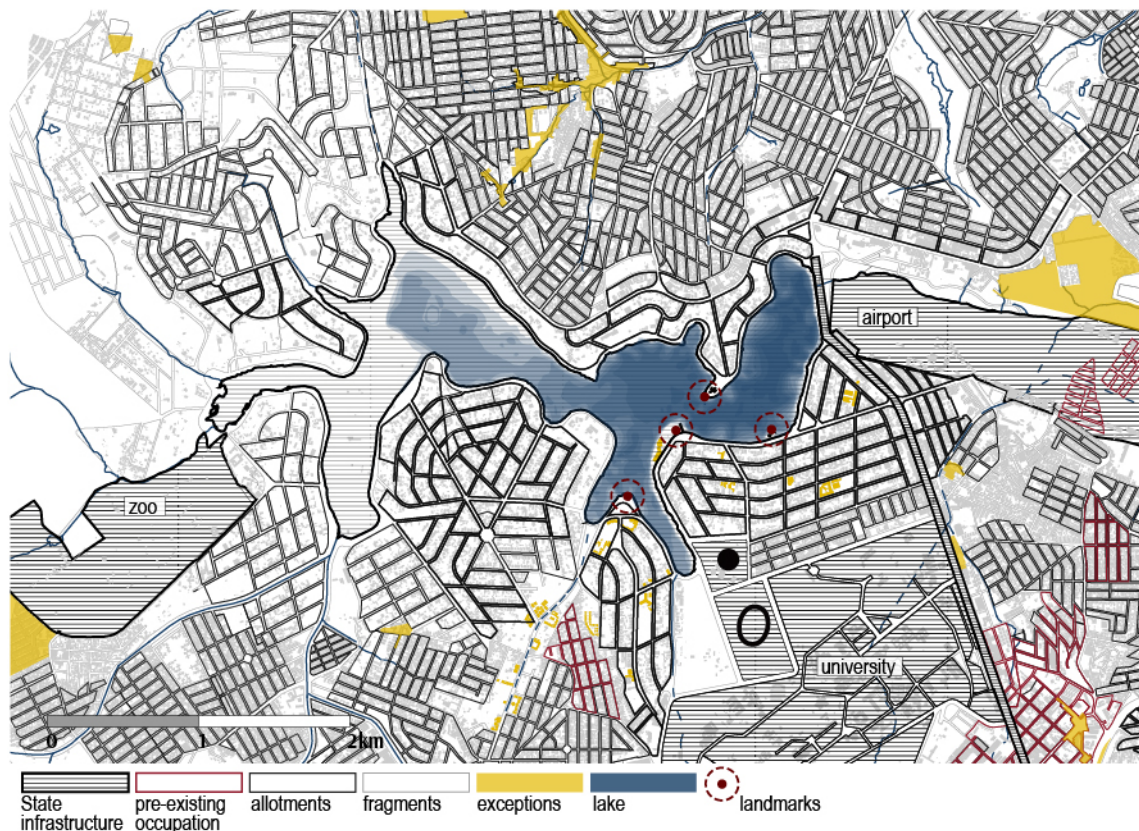
One of the main criticism of Belo Horizonte's plan and implementation is its uncontrolled sprawl in the first decades, presenting an inverted growth, from the periphery to the centre (PAULA; MONTE-MÓR, 2004; TONUCCI FILHO, 2012). The presented cartographical analysis of the suburban area, with all its juxtaposed rationalities, shows that, however not developing according the Aarão Reis plan, it was not as ungoverned and chaotic as is usually portrayed in Belo Horizonte's historiography. In some areas, it actually follows the original plan, in the main access streets in the northern and southern neighbourhoods and larger structures such as the cemetery and the hippodrome (north and west). In other cases, the occupation follows the agricultural structures. The resulting map of the juxtaposing rationalities at stake between 1893 and 1928 show that in fact the areas occupied were the ones in which state projects where applied, the strip for 30.000 inhabitants and the agricultural colonies. Also, the area which received more buildings at first was the immediate northern suburb, all along the Arrudas river valley, along the railway, in the proximities of the Rail Station. This is of course, a direct result of the government actions, as this area was the first to be worked on, with the construction of the railway being the very first action of the Construction Commission. As the Urban zone was either not yet demolished, either not yet built or with reserved plots, the large influx of population attracted by the city construction probably began to occupy the available areas along the valley even before the official plan was officially launched. It is important to remind that the Commission works began already in 1893 with expropriation, surveys, expropriation of land and railway construction.

The intention of this map was showing a different version of Belo Horizonte's foundation, not the one provided by Aarão Reis plan of 1895, which alludes to a tabula rasa condition. It tries to depict the image of a city that is not founded at once, but is slowly conformed over decades and that emerges simultaneously as urban, suburban and rural, not completely erasing its pre-existing village, but resurrecting some of its features, which includes its geographical insertion.

Map 2 – Pampulha (1940s-1990s): from homogeneous enclaves to heterogeneous urbanity

Pampulha, the first satellite town of Belo Horizonte, is generally considered as an important State project that has encouraged the city's development towards the north direction. Although it never really functioned as a proper satellite city – conceived and designed to have its own life with residences and services apart from the main city – it is here called as such in the lack of a better term that expresses what Pampulha was in its beginnings:

a residential and leisure nucleus built outside the city. It is not today perceived as a satellite city, as the ones of Brasília for example, but it has been in the past. Invited by the then mayor Kubitschek to visit the city, the French urbanist Alfred Agache had suggested to build a satellite city for workers around the lake, worried about the social problems and the disorder of the city he saw. This idea was not accepted, as we will see next (SEGRE, 2012). In 1948, Otacilio Negrão de Lima, as the mayor, presents in his report a section about the Satellite Cities, which he considered as necessary due to the excess of population and the lack of water of Belo Horizonte. In his conception, the Barreiro was already an agricultural satellite, the recently created Cidade Industrial would be the textile centre, while Pampulha was the centre of tourism and entertainment (BELO HORIZONTE, P. M. DE, 1948).



Source: by author with data from: Prodabel; PDDI-RMBH; Portal Plantas Online (PBH); Google maps.

Although largely regarded as a State project, Pampulha is not, however, the result of a specific masterplan or any comprehensive urban plan, as we will see. At the municipal and State's public archives various documents witness the construction of the Pampulha dam but holistic plan representing the reservoir and bordering neighbourhoods exist. As in the previous episode, the exercises of analysis and re-mapping of archival cartography supported by texts allowed, through comparison, better understandings on the landscape profound transformations in the period. In the absence of a holistic plan for Pampulha – such as Belo Horizonte's 1895 plan –, the mappings have reconstructed the timeline of Pampulha's materialisation throughout five decades, by combining and retracting private allotment

approval plans, available at municipal archives, and the documented State punctual, however massive, investments.

Pampulha is, therefore the result of the gradual accretion of governmental as well as private actions, bigger or smaller, which are represented in the above map. In fact, the inauguration of new fronts for expansion of the city, an idea already totally embraced by 1948, goes in the opposite direction of Lincoln Continentino's plan for Belo Horizonte, presented in 1941 and elaborated in the years before, which advised to avoid sprawl by adopting the compact city model (AGUIAR, 2006). It goes also in the opposite direction of the Decree 54 of 1935, which tried to halt city expansion by regulating land allotments. In the same moment, the lake of Pampulha is presented in Otacilio Negrão de Lima's report of 1937 as a solution for the water supply of a growing city. Nevertheless, a small sentence reveals the future desires for Pampulha: "The accumulation [of water] will serve to the practice or water sports" (HORIZONTE, 1937, p. 54) Simultaneously, the mayor gives a speech in the municipal chamber promoting the "edification of a new and picturesque leisure neighborhood" at Pampulha (Anais da Câmara Municipal de Belo Horizonte, 1936, cited by FERREIRA, 2007)), predicting therefore the future construction of a neighborhood around the lake. To access the lake, a large avenue is laid out, Avenida Antonio Carlos, substituting the old road to Venda Nova.

A few years later, after the completion of the dam, the decree n. 55 of 1939 (BELO HORIZONTE, 1939) rules de division of plots and construction parameters in the plots bordering the lake. It's first article determines that projects, surveys and levelling of the plot subdivisions within a 500 meters strip around the lake will be undertaken by the municipality, under the request of the owners. The second article, while prescribing a minimum of 20 meters front and 1000 sq meters of area in the plots, establishes an exceptional case in the municipality, as it is cut out from the Decree 54 of 1935 (BELO HORIZONTE, P. DE, 1935) which ruled over the subdivision of plots in the rest of the city, at the same time that it determines which kind of use and social class would be established there. The allotments that resulted from this law - highlighted in the map – have formed a sort of belt around the lake in which only high standard, gardened houses are allowed, securing the image of Pampulha as a wealthy, elegant area. They were all approved in 1943, signed by then mayor Jucelino Kubitschek who became known as the 'creator' of Pampulha as we know today. Despite the exposed antecedents, the dam formation and the law of 1939, Pampulha is highly associated to his administration, after taking over the municipality in 1940. He saw a great future for Pampulha as a tourism centre, which could increase the revenues for the municipality. To accomplish his view, he hired the architect Oscar Niemeyer to build four buildings around the lake, all dedicated to culture and leisure – a Casino, a Ball Room, a Yatch Club and a Church. This new occupation comes as something totally new, just as the foundation of the city itself, ignoring completely the pre-existing fabric in the area (shown in red in the map).

In the following two decades, as the occupation of Pampulha has still at a very slow pace, the State made large investments in the region, seen the availability of land and the large investments already made to connect it to the city. The ones with the larger spatial impact are: the airport, the University Campus, and the Zoo. Slowly in the 1950s and more

intensely on the 1970s⁴, other allotments began to fill the gaps left between Pampulha and the centre, south of the lake, and Pampulha and Venda Nova, to the north. The rule applied to the border of the lake no longer applied to those, complying to the general rule of the city. This resulted in a contrast between this and the precedents that is visible in the map, marking a strong division between two kinds of 'Pampulhas' that is also visible on the map. The fragmentation of the farmland in the area meant also the fragmentation of allotments and the heterogeneity of its urban form. The spaces in-between, especially around the creeks that feed the lake were left without allotment – identified as 'fragments' in the map. With time, these gaps were filled with whatever was not included in the monofunctional residential enclaves of Pampulha, which ranges from slums to highly active commercial areas (marked in yellow). These 'exceptions' filled the physical as well as the social gaps in Pampulha, allowing heterogeneity of classes and uses. Instead of being secluded and isolated by the high class residential enclaves that surround it, the lakeshore can fulfil its originally intended role, which is to provide leisure to all inhabitants of the city, and now, metropolitan area.

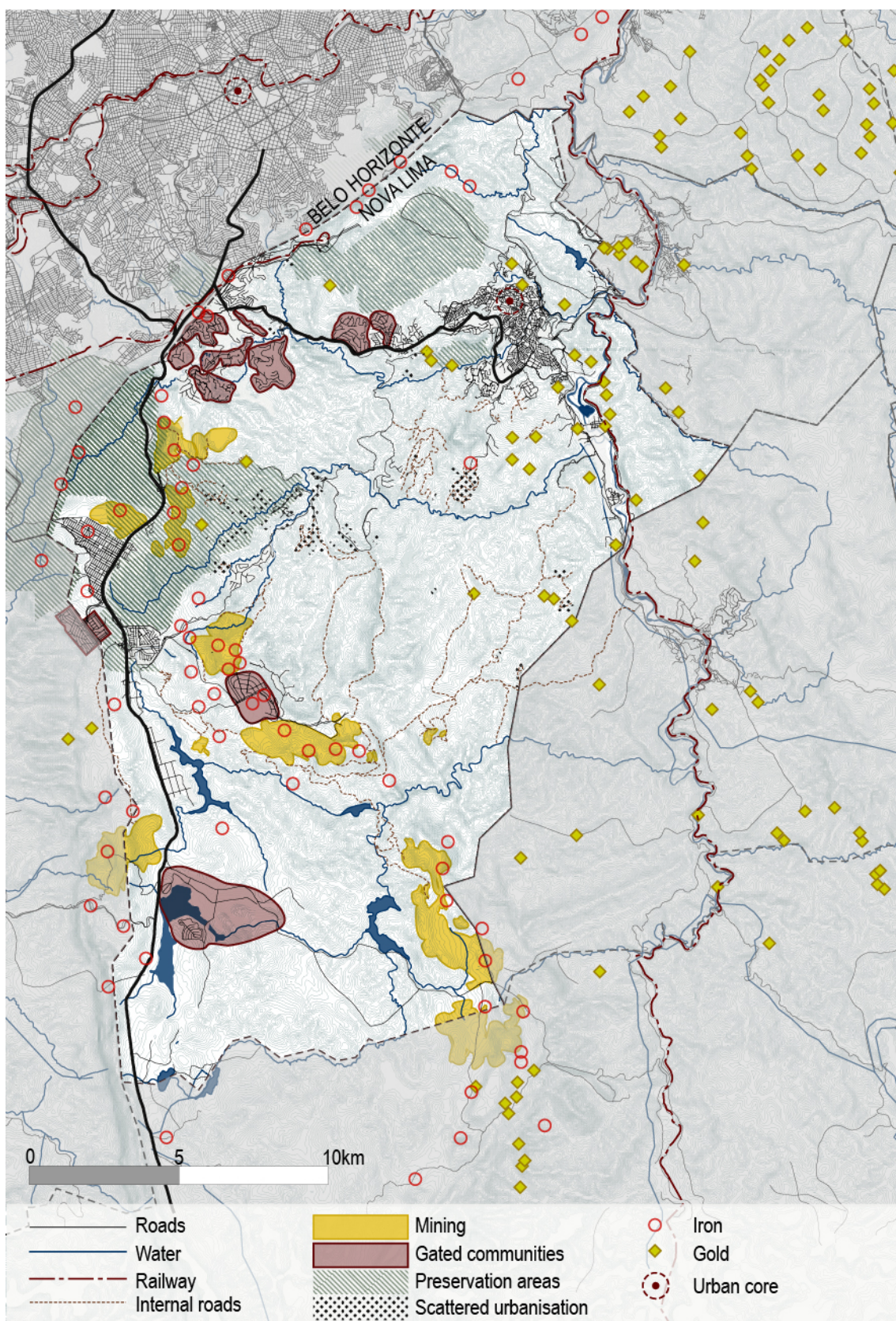
By highlighting the state infrastructure applied, the pre-existing tissues and the exceptions, the map tries to show, through cartography, that Pampulha is in fact a very diverse territory and not only the ensemble of the lake and the architectural landmarks as it is usually depicted. It is not a project of two brilliant men, Kubitschek and Niemeyer, but of many people together, which already existed before them and gained a whole new life after them.

Map 3: Nova Lima's patched urbanisation

The map of Nova Lima tries to depict its multifaceted character through the combination of at least three themes representative of the conflicting forces acting in this territory today: human settlements, mining and environment.

The history of Nova Lima is deeply intertwined with mining, the reason for its foundation and until today its main economic drive. The words of Richard Burton, the nineteenth century British traveler, define it well: "Built by mining, it fell with mining, and by mining, it has been 'resurrected'" (BURTON, 1983, p. 195). Until the mid 1800s, the town was one of the many within the mining colonial urban network (MORAES, 2006) having gone through the golden age and subsequent decay.

⁴ The dates refer to the approval of the allotments stamped in the Cadastre maps. It is possible that many allotments already existed and became legalized only in the 1970s, before the first zoning law was launched, in 1976.



Source: by author with data from: IBGE; PDDI-RMBH; CPRM; Google maps.



The economic and political openings after Brazil's Independence (1822) allowed the establishment of English companies in Brazil, transforming radically the mining activity in the region. The input of large amounts of capital directed at technological development allowed the extraction of underground gold and started a new era of resource extraction in the region. At the turn of the 20th century, geological surveys revealed the existence of large iron ore deposits in the region today named *Quadrilátero Ferrífero*, in which Nova Lima is centrally inserted. From this moment, many foreign companies started to acquire large pieces of land in Nova Lima, starting a new cycle of extraction in the region, now focused on iron ore. To the present day, most of the municipality's territory belongs to these companies which are in fact the ones orchestrating the urban development around the region.

Until the 1950s, Belo Horizonte's metropolitan extension had been towards the North and West directions, fostered through State projects such as Pampulha (north) and *Cidade Industrial* (west). The south and the east presented two impediments: one is the *Serra do Curral*, a mountain ridge crossing in the southwest-northeast direction forming the borders between Belo Horizonte, Nova Lima and Sabará; the second is the large concentration of land in the hands of the mining companies.

However, the 1950s showed already a turning point to Nova Lima's urbanization. As the BR040, the express highway connecting Belo Horizonte to Rio de Janeiro, was constructed, financial difficulties led the mining companies to sell lands bordering the new highway (PIRES, 2003). The sum of these events resulted in the urbanization of strips along the road, a typical phenomenon which Panerai (2006) has called 'the path and the hill'. The pioneer settlements were the ones today known as Jardim Canadá, Vale do Sol and Miguelão. Very soon, the first gated communities emerged in the region, however not totally attached to the highway as the first ones. The first dwellers of this condominiums were attracted by the 'living within nature' ideology offered by the region's beautiful landscape. Morro do Chapéu and Retiro das Pedras were the first of this kind, followed in the subsequent decades by many others. The same occupation pattern started to emerge simultaneously along the MG030, the road connecting Belo Horizonte to Nova Lima original nucleus, with Ouro Velho Mansões being the pioneer in this new kind of settlement: gated and directed to high classes.

After the 2000s Nova Lima's dynamic started to change drastically with two events: the inauguration of Alphaville, a large gated community at the south of the Municipality, shaped in the molds of the American Suburb for permanent dwelling (instead of weekend homes); and the verticalization of Belvedere, the last neighborhood in Belo Horizonte, spilling over Nova Lima in the Vila da Serra neighborhood. Lower prices, taxes, and more flexible urban regulations in Nova Lima, meant a higher-density occupation in vertical towers contrasting to a hilly landscape of a preexisting allotment meant for low rise. Since then, Nova Lima has seen an unprecedented densification of some areas as well as the spreading of new horizontal gated communities towards its territory, which are a threat to environmentally protected areas – Vale dos Cristais, Village Terrace, Vila Alpina and many others.

Besides an already well-known story of the gated communities, the above map allows the visualization of a third layer which is acknowledged despite hardly seen from the windows of the high-class towers: mining. Not unexpectedly, but seldom visible, the mining pits are very close to (gated or not) human settlements and bordering the highway. The overlapping



of underground to over-ground data allows the visualization of the juxtaposition of iron ore registered deposits (orange circles), mining pits, the highway and human settlements. This is no coincidence: this unique geological formation has resulted in large concentrations of iron ore following a ridge. The availability of already mined and infrastructured land has a consequence the construction of gated communities, generating a third economic wave for the mining companies, now with real state. To the east of the municipality, the concentration of gold, instead of iron, meant another kind of occupation, which relates more to the 18th century mining colonial urban network: small scaled and along the roads and mines.

Nova Lima holds therefore at least five very different kinds of human occupation within its municipal borders, in complete dissociation with one another. While the gated communities hold a very homogeneous ground of settlers, the core of Nova Lima functions as an average small town, with heterogeneous groups, but still different from the new patched neighborhoods along the highways, more heterogeneous than the condominiums but still detached from the main-city. On the borders of Belo Horizonte, the vertical occupation of Vila da Serra, functions exactly as other luxurious neighborhoods of the capital, however on Nova Lima grounds and completely detached from its core. Intertwining those, are the mining grounds, not resumed to the visible pits, but including a large influence area with its own parallel infrastructure of roads, railway and water cycles, not to mention the *minerióduto*.

FINAL REMARKS

The maps here produced according to the cartographic method and principles here exposed have provided, on one hand, the exposition of historical urban facts already known but not necessarily interpreted spatially, and on the other, uncovered relations not usually perceived or generally neglected.

The timeframe stretching of Belo Horizonte's foundation map allows overcoming the stigmatization produced by the fixed image of the *tabula rasa* perpetuated by Aarão Reis' plan's iconography, leading to interpretations of an 'ungoverned' growth when comparing this plan to the built city. The rhizomatic juxtaposition of different times, cartographies and diverse historiographic sources has allowed to see Belo Horizonte's formation as a process and not as an instant.

In the same way, it was possible to see how Pampulha was formed by a series of both private and public gradual actions and not solely by the magic touch of Kubitschek and Niemeyer. It also became visible how instruments to organize and shape space and its occupation have functioned to perpetuate long standing social asymmetries, also fixed in Belo Horizonte's foundational core, and which continues, with new apparatus, in the next episode.

The exposing of the historical formation of Nova Lima's tissues has allowed the visualization of the already acknowledged, however seldom perceived, intertwined relations between urbanization and mining. Approaching Nova Lima as a unique landscape, however fragmented, allows the understanding of its current territorial conditions in relation to its historical relations, and, most importantly, its underground features.



In all cases, space and landscape have been put on the foreground allowing a spatial historical reconstruction. This has fostered a deeper understanding of how social relations, governmental projects and individual actions reflect on urban space, contributing to the shaping of the city. It has shown, materially and visually, that urban space is not solely a social product, but an aggregation of actions and objects, to which we must include topography, valleys, water courses, mineral resources, etc. Those are known to shape the city, but usually undermined or neglected when the social production of space is foregrounded. The maps here presented are not a final product⁵, being just one of the infinite possible unfolding narratives, contributing to bring new insights to urban history and theories, by providing a true knowledge of space and the processes involved in its formation, rather than pure descriptions of spaces, as defended by Lefebvre.

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⁵ Due to the limited scope of this article, only fragments of the research results are exposed.

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