

# The study of urban form in Brazil

**Staël de Alvarenga Pereira Costa**

Departamento de Urbanismo, Escola de Arquitetura Universidade Federal de Minas Gerais, Rua Paraíba 697 sala 404c, Bairro dos Funcionários, Cep 30130140, Belo Horizonte, MG, Brazil. E-mail: staelalvarenga@gmail.com

and

**Maria Cristina Villefort Teixeira**

Departamento de Projetos, Escola de Arquitetura Universidade Federal de Minas Gerais, Rua Paraíba 697 sala 404b, Bairro dos Funcionários, Cep 30130140, Belo Horizonte, MG, Brazil. E-mail: mcrisvt@gmail.com

*Revised version received 26 July 2014*

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**Abstract.** *In exploring the multidisciplinary development of urban morphology as a field of knowledge in Brazil, this paper is an outgrowth from an earlier contribution to this journal. The main aspects considered are the antecedents of urban morphology in the colonial era and early decades of independence; the pioneering work of sociologists and historians in the inter-war period; the influence of modernist thinking; the contribution of urban design courses; and the significance of the ISUF Conference held in Ouro Preto in 2007. The main characteristics and methodological foundations of studies produced in the fields of geography, architecture and urbanism are considered. The breadth of urban morphology and the challenge of stimulating further research are underlined.*

*Keywords: morphology, interdisciplinary, planning, architects, geographers, Brazil*

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There have been significant developments in urban morphology in the Portuguese-speaking world in the 8 years since Pereira Costa (2006) provided in this journal a brief review of progress in Brazilian urban morphology. It is timely therefore to provide a broader conspectus of studies of urban form, past and present, relating to that country.

The Brazilian contribution to publications on urban morphology that have an international readership has been quite limited until the last decade or so. The problem of language barriers may well be part of the explanation. Moreover, although presentations by Brazilian academics at ISUF conferences have been numerous, their contribution to the methodological development of the field has on the

whole been small. Indeed, human geography, architecture, urban planning and urbanism are the only areas of knowledge within Brazil in which urban morphology is significantly represented. Furthermore, though several researchers in these fields have described their work as being concerned with 'urban morphology', in practice their work could readily be subsumed under the more general description 'urban studies'.

There is often a misinterpretation of the term 'urban morphology', which is frequently regarded as synonymous with 'urban form' as distinct from 'the study of urban form'. According to Larkham (2002), this misinterpretation tends to be associated with the reduction of the tripartite complex of form,

function and historical development to a two-dimensional static vision. It has often been observed in studies of urban form presented at ISUF conferences, and is by no means limited to those authored by Brazilians. However, in this paper leading urban morphological research in the strict sense of the term will be highlighted, including that on Brazilian cities by researchers based outside that country.

### Antecedents of urban morphology

The first records of Brazilian cities are to be found in the descriptions of foreign explorers who came to the country on voyages of scientific exploration promoted by the colonizing powers. They depicted the landscapes and customs of the colony, especially its cultural, historical, social and economic characteristics, notably in the form of paintings and drawings. These would later be presented in the artist/researcher's mother country as a vision of a new life and exotic wealth. A predominantly naturalistic view of the landscape can be observed in these records. There was little consideration given to the form of cities, reflecting the fact that the urban centres of the time were little more than villages, formed spontaneously and without formal structure.

Important individuals who carried out research during their travels in Brazil include the Dutch painter and botanist Albert Eckhout, who portrayed the landscapes and indigenous population of Pernambuco, in north-east Brazil, between 1637 and 1644; the German naturalist Humboldt, who explored South America and the Amazon region in the eighteenth century; the German painter Rugendas who, when visiting the country between 1822 and 1825, painted the coastal cities, especially Rio de Janeiro; the French naturalist Auguste Saint-Hilaire, who portrayed the provinces of Rio de Janeiro and Minas Gerais between 1816 and 1822; and Richard Burton (1976), who was responsible for revealing detailed features of Minas and Bahia, along the San Francisco River.

The English researcher and explorer

Marianne North is notable for her descriptions of the flora of Rio de Janeiro and Minas Gerais and her comparisons of the ways of life in cities in the mining regions of Brazil and the customs of English towns at the time (Gazzola, 2001). Such works made an important contribution to the study of the first Brazilian urban nuclei since, in the absence of maps, their reports and graphic illustrations provide clues to the character and development of these places.

### A conspectus of key research

The first studies with significant contents that might be described as urban morphological were undertaken by sociologists and historians, such as Gilberto Freyre (1933) and Sergio Buarque de Hollanda (1936). But these descriptive studies of Brazilian customs and culture tended to consider social, economic and political aspects, rather than portraying the physical form of places.

Gilberto Freyre, in writing many articles about the country's various ways of life, revealed the importance of the study of house types when analysing and understanding the formation of the individual and society. The identification of regional differences and the establishment of relationships between buildings and their surroundings were also highlighted in his work. He recognized different building types and used these as a basis for discussing the development of society in the nineteenth century, including the social antagonisms that existed. *Sobrados e mocambos* (Freyre, 1936) is a contribution to this analysis. It describes the beginnings of new types of urban living under a system of slavery; the plantation owning aristocrats who occupied houses in the city; the basic types of elite; and the slaves who left their quarters to dwell in shacks and hovels made of straw and mud in the poorest urban neighbourhoods. He describes how the cities of Recife, Rio de Janeiro, São Paulo and São Luís do Maranhão were constructed in the nineteenth century. Aragão (2011) comments that Freyre's work in some respects anticipates the study of urban

form in Brazil as it was to develop in the post-war period, noting that it aids recognition of the varying character of places, their changes over time and, not least, the character of nineteenth-century house types.

In contrast, Buarque de Hollanda (1936) in *Raízes do Brasil* compares the principles underlying the early settlements, referring to these as the 'tiller' and the 'sower' (*ladri-lhador e semeador*). The principle that underlies the formation of Spanish Latin American cities is referred to as the 'tiller', because it is founded on a plan. Cândido (1995) referred to this as 'an enterprise of reason' which took material form in the grid systems characteristic of Latin American cities at this time. This principle predominantly employs the straight line, which is fundamental to the Spanish method of planning cities. The Portuguese principle in contrast is referred to as the 'sower', alluding to the winding features that characterize the urban form, whose contours follow the indigenous landscape. This study was the forerunner of numerous investigations into the principles underlying the creation of Brazilian urban centres (Delson, 1997; Marx, 1991; Pessotti and Ribeiro, 2011; Smith, 1968).

A number of studies carried out by architects were influenced by French and German morphologists. These include the work of Lúcio Costa (1995) who investigated the Portuguese influence on Brazilian architecture and was also influenced by having studied under Marianno José Carneiro da Cunha Filho (1881-1946), a tenacious defender of Brazilian art (André, 2011). Marat-Mendes and Oliveira (2013) have drawn attention to Costa's presence in Portugal and his exchanges with Portuguese architects who were carrying out joint field work in the mining towns of the Brazilian interior (André, 2011). The collaborative surveys developed by Portuguese and Brazilian architects sought to establish principles and detailed typologies by observing the dimensions of buildings, construction technology, and other features. Another noteworthy figure was the architect Sylvio de Vasconcellos (1956), whose book *Villa Rica* reveals the social and physical

environment and the components of urban structure. He also provided a thorough analysis of the building typologies developed during the colonial period of gold exploitation. Aspects related to façades, plans, interiors and construction techniques are all meticulously presented. Vasconcellos also worked with Costa at the local office of the Institute for National Heritage in Ouro Preto. Here they were able to develop studies of types of colonial towns in Minas Gerais and thus contribute to both the understanding of the building types and the colonial evolution of towns. In providing important observations on the origin of colonial urban settlements, Costa and Vasconcellos's work can be considered as a starting point for a series of surveys that remain relevant today.

The studies outlined thus far had as a major aim the typological development of housing in the country and the subsequent formation of urban fabric and structure. This trajectory was subsequently continued and further developed by academics from the School of Architecture at the Federal University of Minas Gerais. They also embarked on research that would strengthen one of the principal traditions of the school: the evolution of urban form and the typology of colonial mining towns. Among them was John Boltshauser (1968), who developed particularly innovative studies of the evolution of the Latin American metropolis, focusing on the role of legislation in the formation and transformation of cities. Similarly, from a historical perspective, Nestor Goulart Reis Filho (1968, 1970) mapped out the structure of the Brazilian city and its transformation over time, including the delimitation of plots, the location of houses on them, and their relationship to the street. His examination of urban form illustrates a process of evolution, starting with the initial occupation of urban centres.

### Modernism and the vicissitudes of research

An important stage in the development of Brazil's urban form is highlighted by the models of the early-twentieth century city.

Many of these planned cities were influenced by the construction of new state capitals and were inspired by the ideals of the garden city, the latter being adopted as the basis for the planning and development of residential neighbourhoods in major Brazilian cities. This period was also characterized by the urgent need for the provision of infrastructure and the consequent renewal projects which involved the widening of streets and construction of new residential areas (Andrade and Magalhães, 1989; Manso, 2001; Szmrecsányi and Ottoni, 1997).

The construction of Brasília in the mid-twentieth century is an important example of the design and construction of a city that followed models of urban form based on a strong ideology: the modernist model was adopted by the government as a major reference in urban planning. Academic studies of the time reflected the influence of modernist ideology in many architecture courses, particularly focusing on the conception and construction of housing projects.

Two factors contributed to the search for new urban models in the 1960s. The first was the growth and expansion of large cities, which required planning solutions related to the provision of urban infrastructure, especially access to housing and health. Secondly, there was the lack of public investment in new plans for rapidly expanding cities at a time of particular need. The years of military dictatorship (1964-1984) further exacerbated the situation and were marked by disruption in universities and a decline in both scientific research and urban construction. Prominent academics were prevented from working and several research projects were aborted. Those who remained continued to teach but, under conditions of strict surveillance, produced little research.

At the same time, the dominating principles among geographers were provided by quantitative geography, conceived from an ideological commitment that served to justify capitalist expansion without expressing the essence of social reality in terms of space. Nevertheless, in all fields of knowledge the application of qualitative research, which

sought to demonstrate new principles, resulted in better conditions in cities and for their inhabitants. Fields of knowledge started to develop that brought together aspects of economics, sociology and anthropology. This brought to attention the importance of emerging interdisciplinary exchanges between scholars, for example between geographers, philosophers, economists and planners. As a consequence, Henry Léfèbvre, Louis Althusser, Manuel Castells and Charles Bettelheim became influential in Brazilian research and were emblematic of the transformation of the social reality necessary for enhancing urban living conditions and alleviating socio-economic and regional disparities.

One of the researchers who rose to prominence at this time was the geographer Manuel Correia de Andrade (1963, 1976), whose work included research on urban development in Pernambuco. Pre-eminent in this period was Milton Santos. His book *Por uma geografia nova* (1978) portrayed the crisis in geography and favoured ideas for a pragmatic renewal of the discipline. He was concerned with the relationship between urban space and social factors and advocated the development of new concepts, reflecting his concern for the configuration and humanization of the city. Santos held the view that to nullify the powerful forces and adverse effects of globalization, namely homogenization and speculation, city planners should prioritize local and human dimensions. Furthermore, he believed that this emphasis could be extended to the regional and global spheres.

Within a further 2 decades the development of an increasing concern for the humanistic and cultural aspects of the city became evident. Livia de Oliveira and Vicente Del Rio (1996), in collaboration with researchers at the University of San Carlos and the Federal University of Minas Gerais, presented a framework for the humanist school. Lucy Marion Machado (1988) was particularly concerned with the perception of the urban landscapes of São Paulo. The research on Paraná state by Linneu Bley (1982) derived its perspective on the city from paintings and works of art

produced in Curitiba. Conceptual work on the epistemology of perception – including drawing on urban geography – and on studies of the structure of medium-sized cities characterized the work of Oswaldo Bueno Amorim Filho and Sena Filho (2007). Further work in this field by Maria Elaine Kohlsdorf (1996) gave particular attention to the importance in understanding of urban form of appreciating the building in urban space.

The charismatic teacher and French cultural geographer, Paul Claval influenced a number of scholars in Brazil, including Roberto Lobato Correa (1989) of the Federal University of Rio de Janeiro. The latter developed studies related to the manifestations of culture, and the historian Mauricio Abreu (1987) portrayed the processes involved in the transformation of space in the city of Rio de Janeiro. Abreu's studies sought to investigate the division of urban land into plots, the emergence and spread of slums and the evaluation of urban policies.

#### **The contribution of urban design courses**

The 1980s had brought a new era, not only because several researchers returned from exile, but also because postgraduate courses were introduced. Studies of typologies and the evolution of urban form restarted under influences from Europe, Asia and America. The influence of the Conzenian British School of urban morphology (Whitehand, 2001) was evident, as was that of the Italian School (Caniggia and Maffei, 2001). However, the works of neither of these schools were cited as much as the widely translated studies by Aldo Rossi (1977), Lamas (1993) and Aymonino (1981).

The urban design course at Oxford Brookes University, England, has been noteworthy for its effects on both research and practice. Ivor Samuels, in particular, greatly influenced his Brazilian students and was responsible in large part for the creation of a new generation of urban morphologists in Brazil. These included Vicente Del Rio (1990), Humberto Yamack

(2003), Romulo Krafta (1986), Stael Pereira Costa (2003), Flávio Malta (2007) and Lélia de Vasconcellos (2011), all of whom developed urban morphology in both research and as the basis for practice. The ideas arising from this methodology were discussed initially at the University of Brasília in seminars on urban design (Turkienicz, 1984), where themes related to urban morphology and urbanism were also developed by Holanda (2000) and Kohlsdorf (1996). Presentations at these seminars contributed to the consolidation of different research fields and continue to influence major lines of thought.

#### **Four lines of research**

The continuing concern with settlement history is often associated with the preservation of individual monuments. However, a broader view of urban and cultural heritage began in the last decade of the twentieth century, leading to concern about the development of historical sites (Castriota, 1998; Gunn, 2009; Reis Filho, 2000; Toledo, 1996).

A different line of research is associated with the group initially co-ordinated by Carlos Nelson Ferreira dos Santos (1984), which highlighted the importance of identifying the subdivision of plots and the form of spontaneously-developed settlements. He describes the layout of streets in relation to topography and constructions erected by local people. This important line of research focuses on identifying the patterns of urban fabric necessary for the maintenance of social groups on a particular site. Such work culminates in the description of the general morphological characteristics of slums and private plots. Pereira Costa (1986) and others have attempted to identify the existing features of such slums and favelas in order to maintain their character and allow residents to both remain in a familiar environment (Magalhães and Ferraz, 2004) and maintain their traditional customs and community.

In relation to the study of housing, discussions arising out of the work of Erminia

Maricato (1979, 2001), Raquel Rolnik (2005) and Nabil Bonduki (1998) have contributed to the formation of new approaches to houses and the right to citizenship. In addition they have demonstrated techniques and construction methods that have resulted in new housing schemes that were made possible by the formalization of land property rights. Recent studies have also analysed how tenants of housing schemes have tended to favour privatized house types and communal spaces, thus contravening the precepts underpinning housing policies and schemes in Brazil (Teixeira, 2004).

A yet further line of research is concerned with new urban forms and especially the impact of new settlements on the landscape. This type of analysis focuses on the subdivision of land, the creation of different types of plot and the visible results in private and public open spaces, including parks. Studies developed by a national research network on systems of open spaces and the constitution of the contemporary Brazilian public sphere (Macedo, 1999) are those that come closest to traditional morphological studies.

### The ISUF Conference of 2007

The successful hosting of the ISUF Conference in the city of Ouro Preto, Brazil in 2007 was a landmark in the development of studies and research on urban form in Brazil. The large number of proposals for submissions of papers was indicative of both the interest in urban morphology and the attractiveness of an emblematic city. Analysis of the list of those attending revealed the wide participation of Brazilian architects and planners, as well as historians, geographers and sociologists.

However, despite the interest that was generated, it would be hard to conclude that the conference marked a major acceleration in significant urban morphological research in Brazil. Arguably this relates at least in part to the limited attention that was given by Brazilian contributors to concepts and methods. Only about 10 per cent of their papers were primarily methodological. Most

of these used the methods of space syntax (Hillier and Hanson, 1984), developed at the Universities of Brasília (Holanda, 2000), Recife (Amorim and Griz, 2008), Porto Alegre (Krafta, 2009; Rigatti and Souza Silva, 2007), Natal (Trigueiro and Soares de Medeiros, 2007) and Florianópolis (Saboya, 2010), to mention the most prominent. In contrast, studies and research on more traditional methods were presented by representatives of the Universities of São Paulo (Macedo *et al.*, 2012), Minas Gerais (Pereira Costa *et al.*, 2009) and Paraná (Rego and Meneguetti, 2011).

After the conference a workshop was held at which followers of two of the leading schools of urban morphology led discussions on the work of their founders, M. R. G. Conzen and Saverio Muratori. The presence of numerous students and young professionals raised the expectation that an increasing number of new Brazilian contributions would follow. This expectation was to some extent realized in a project on open spaces in Brazilian cities. This was co-ordinated by the Faculty of Architecture and Urbanism at the University of São Paulo and brought together researchers from almost all the Brazilian states. The first publication of the research identified, classified and analysed the production of public open spaces in the major Brazilian cities from the perspectives of the state, civil society, developers and other agents, and also examined current planning legislation (Macedo *et al.*, 2012). Initial results confirmed that in the cities surveyed there had been both a reduction in the number of vegetated open spaces and in the connections between them. There have therefore been strategies to ameliorate the problem. In accordance with proposals put forward by the British school of urban morphology, it was suggested that fringe belts could be used to enhance the connectivity of open spaces within cities (Pereira Costa *et al.*, 2009). In a similar way Pereira and Meneguetti (2011) have developed research into open space systems in their regions. The incorporation of morphological concepts, of which the fringe-belt concept is a notable example, has occurred

largely in two ways: first by traditional morphological studies performed by groups in Maringá (Rego and Meneguetti, 2011), Curitiba (Rosaneli, 2011; Rosaneli and Shach-Pinsly, 2009), Uberlândia (Cocozza and Libera, 2012) and Belo Horizonte (Pereira Costa *et al.*, 2009); and secondly, through detailed, mainly descriptive, studies of typologies of private open spaces and the subdivision of plots (Macedo *et al.*, 2012). However, the large majority of studies of Brazilian cities do not satisfactorily incorporate morphological analysis.

## Conclusion

In undertaking this review it has become apparent that few research projects in Brazil employ urban morphological concepts of the type that have tended to underpin research in influential parts of Europe. This may be partly explained by the content of different disciplines and the roles that those disciplines have played in the world community of urban morphologists. Geographers, for example, treat the understanding of urban space as primarily a contribution to geographical science, while architects and planners tend to apply their concepts to practical interventions within cities. The significant influence on Brazilian geography of the French school of quantitative geography, which has tended to concentrate on social, political and economic topics rather than urban form, is at least part of the explanation for the relatively small contribution of Brazilians to geographical urban morphology. Within architecture and urbanism the methods of space syntax are more prominent than what are regarded by many as the traditional methods of urban morphology. However, this survey of the study of urban form in Brazil has occurred at a time of major developments within urban morphology in the Portuguese-speaking world more generally. The findings described here, beginning with the antecedents of urban morphology as an organized field of knowledge and then expanding on its development mainly within the post-war period, may well

need substantial updating within a comparatively short time.

## Acknowledgements

The authors acknowledge support received from the Fundação de Amparo à Pesquisa de Minas Gerais, the Conselho Nacional de Desenvolvimento Científico e Tecnológico, and the Coordenação de Aperfeiçoamento de Pessoal de Nível Superior.

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