edited by Giuseppe Strappa

OBSERVATIONS ON URBAN GROWTH

Lettura e Progetto

Nuova serie di Architettura FRANCOANGELI

Staël de Alvarenga Pereira Costa
Departamento de Urbanismo URB
Universidade Federal de Minas Gerais
Belo Horizonte, Brazil

Anna Rita Donatella Amato
DiAP Dipartimento di Architettura e Progetto
Sapienza Università degli Studi di Roma, Italy

Paolo Carlotti
DiAP Dipartimento di Architettura e Progetto
Sapienza Università degli Studi di Roma, Italy

Anna Irene Del Monaco
DiAP Dipartimento di Architettura e Progetto
Sapienza Università degli Studi di Roma, Italy

Matteo Ieva
Dicar Dipartimento di Scienze dell'Ingegneria
Civile e dell'Architettura, Politecnico di Bari, Italy

Daan Lammers
Architectural Urban Design and Engineering
Technische Universiteit Eindhoven
The Netherlands

Karina Machado de Castro Simão
Departamento de Urbanismo URB
Universidade Federal de Minas Gerais
Belo Horizonte, Brazil

Marco Maretto
Dipartimento di Ingegneria e Architettura
Università degli Studi di Parma, Italy

Nicola Marzot
Dipartimento di Architettura
Università degli Studi di Ferrara, Italy

Ana Pereira Roders
Architectural Urban Design and Engineering
Technische Universiteit Eindhoven
The Netherlands

Giuseppe Strappa
DiAP Dipartimento di Architettura e Progetto
Sapienza Università degli Studi di Roma, Italy

Tolga Ünlü
Department of City and Regional Planning and
Centre for Mediterranean Studies
Mersin Üniversitesi, Turkey

Pieter van Wesemael
Architectural Urban Design and Engineering
Technische Universiteit Eindhoven
The Netherlands

Informazioni per il lettore

Questo file PDF è una versione gratuita di sole 20 pagine ed è leggibile con

La versione completa dell'e-book (a pagamento) è leggibile con Adobe Digital Editions. Per tutte le informazioni sulle condizioni dei nostri e-book (con quali dispositivi leggerli e quali funzioni sono consentite) consulta cliccando qui le nostre F.A.Q.

READING AND DESIGN

A series edited by Giuseppe Strappa

In what is now the vast field of architectural publishing, this new series of books intends to carve out an its own space by offering readers essays, research and observations on architectural topics related to the study of the built environment and the design instruments that derive from its interpretation.
Today, architecture is a universe on the move that contains many different interpretations of the term 'design'. Much of it (what occupies the most column inches in field literature) seems to have gradually distanced itself from the more urgent issues to do with the construction of real cities, in order to investigate problems associated with the visual arts and communication, the market for image and its consumption. After all, in the climate that this condition fosters, in the need of being seen as different, modern-day designs almost always end up, in fact, resembling each other without a common principle justifying transformations, like a revolution that, in worrying about the change it provokes, has forgotten the reasons behind its goals. By avoiding the overwhelming wake of an individualistic interpretation of architectural expression, this series intends to put forward studies that have concentrated on tackling the problem of the tangible relationship with the existing world: with the changes that modern cities have undergone, with consolidated urban fabric studied in terms of its evolutionary processes, with the territory interpreted, despite many contradictions, as a collective and fundamentally architectural manifestation. It intends to present, in short, studies on architecture considered in its civil aspects.
A second feature identified by the books in this series will be their relationship with the current conditions of crisis in cities and territories. Few periods in the history of architecture have featured such an acritical acceptance of the conditions that determine the construction of architecture. The problem also affects obvious issues to do with language: we are moving towards the use of a metahistoric, locationless, simplified, 'hollow' language, a process that is largely due to the enormous squandering of resources typical of Western society, the
exemption from the elementary needs that bind things together. This condition has ended up making it impossible to interpret the real differences, the relationships of consistency between the elements that make up a building, an aggregate, a city or a territory.
It is for this reason that the series will also include research on the proper use of resources, on the essential role played by the right proportion between means used and goals to be achieved. And also research on architectural and urban organisms formed by processes of continuous improvements and upgrading that prove how the wise and balanced use of resources leads to true innovation, as well as beauty.

All work published in this series undergoes a double-blind peer review process.

In this series:

1. G. Strappa (a cura di), *Studi sulla periferia est di Roma* (2012)
2. M. Maretto, *Saverio Muratori. Il progetto della città/A legacy in urban design* (2012)
3. M.R.G. Conzen, *L'analisi della forma urbana. Alnwick, Northumberland.* Edizione italiana a cura di Giancarlo Cataldi, Gian Luigi Maffei, Marco Maretto, Nicola Marzot, Giuseppe Strappa (2012)
4. E. Barizza, M. Falsetti, *Roma e l'eredità di Louis I. Kahn* (2014)
5. G. Strappa, *L'architettura come processo. Il mondo plastico murario in divenire* (2014)
6. P. Carlotti, D. Nencini, P. Posocco, *Mediterranei Traduzioni della modernità* (2014)
7. E. Prandi, *L'architettura della città lineare* (2016)
8. E. Barizza, *La forma tangibile. La nozione di organismo dalla svolta di Roma al progetto di Venezia* (2017)
9. A.R.D. Amato, *Architettura di Recinti e città contemporanea. Vitalità del processo formativo delle strutture a corte* (2017)
10. M. Falsetti, *Annodamenti. La specializzazione dei tessuti urbani nel processo formativo e nel progetto* (2017)

edited by Giuseppe Strappa

OBSERVATIONS ON URBAN GROWTH

Lettura e Progetto

Nuova serie di Architettura FRANCOANGELI

The volume was published with the contribution of the Department of Architecture and Design (Diap) of the Sapienza, University of Rome.

The publisher and the authors thank the owners of the images reproduced in this volume for the granting of reproduction rights. They apologize for any omissions or quotation errors and ensure to make the necessary corrections in the next reprints in case of error reports.

Scientific organization: Anna Rita Donatella Amato

Graphic design by Antonio Camporeale

Contents

Presentation

The form of expanding cities

Giuseppe Strappa

The reading of the changes underway at the edges of contemporary cities, where the countryside – often already partly urbanised – densifies and turns into urban matter, is one of the most difficult subjects to tackle methodically. Proof of this is the descriptive literature produced on the topic, where depictions of an inextricable complexity and the suggestion of fragmentation, particularly amongst architects, have become true literary genres in themselves. The obvious obstacle is that the forms in which expansion takes place continuously evolve in time and space and seem beyond any rational, general law, while following a comprehensible process is an essential condition for the construction of a study method that can be communicated (and therefore of a design).

The growing complexity of the phenomena that develop on the edges of the built environment, where rural areas prepare for change in ways that seem continually different, can be clearly recognised in post-industrial cities, but the uncertainty inherent in the tools we use to understand and monitor them was already apparent in the post-war period: the very period that attempted to create a limit to the irrationality of cities in chaotic expansion by developing new tools for understanding them.

As far back as the 1960s, the Conzenian school offered a clear inter-

pretation of these phenomena, attempting to generalise instances of interpretation developed for individual cities. This method originated in Alnwick's exemplary study (Conzen, 1960) which, for that matter, we have published in an Italian edition due to the usefulness of the information it contains. The notion of *fringe belt*, which arose with these geographical studies – and initially fell on deaf ears (Whitehand, 1996) – was taken up with greater conviction in recent times, becoming a tool for analysis adopted by both architects and town planners.

The method is based on recognising the urban plan, building types and land use as essential factors in determining the kinds of changes that take place. The common features of one or more of these factors allow us to distinguish fairly uniform areas (*morphological regions*), allowing us to construct models of expansion where we can distinguish forms and phases.

While the resulting model is spatially fairly simple, based as it is on successive rings that move out from the urban centre, its application to the actual built environment is rendered more complicated by the discontinuity of expansion, which usually occurs in stages of rapid growth alternating with periods of relative construction stagnation. M.R.G. Conzen discovered the link between these various phases of consolidation of the urban perimeter and the particular features of building types and land use that determine its form. This is interpreted as the relationship between the result of centripetal forces – particularly obvious in the formation of the inner nucleus, the Central Business District (CBD) – and centrifugal forces that push out towards the edges, infrastructure that does not require immediate access, as well as low-density single-family housing.

This relationship between phases allows us to define the concept of 'fringe belt' as one that is linked to an urban phenomenon that recurs over time, that takes place at the margins between urbanised and rural areas when the growth of housing fabric stops or slows down abruptly, allowing the consolidation of urban structures through services and infrastructure encouraged by the low cost of these areas and the availability of land. In other words, some elements of the urban structure tend to be located on the margins of the built environment, creating specialised areas 'around' housing fabric.

From the many studies that have been carried out, it is clear how the term 'around', whose meaning seems inextricably linked to the term 'belt', should actually be interpreted as a spatial hierarchisation rather than in its geometric meaning. To the point where there are many examples of growth across urban nuclei scattered throughout a

territory, each of which forms its own fringe belt, before merging and forming new urban entities (see a number of the cases published here).

The fringe belt concept, which emerged with the interpretation of historic cities and is often usefully applied to the study of walled cities (Whitehand, 2017), also seems to contribute to the study of both the growth of industrial cities as well as the more complex expansion of modern-day metropolises.

In fringe belt foundation studies, particularly in the English-speaking world, the benchmark example is the British metropolis, particularly London. If, however, we consider the illegal urban sprawl typical of Mediterranean metropolises, consisting of detached houses on the edges of rapidly expanding housing areas, or the 'informal' expansion of South American and Asian cities, it becomes clear how, in many ways and with the proper caveats, the behavioural model features significant analogies.

Saverio Muratori clearly noticed, during the same period as Conzen's research, the condition of crisis that saw post-war cities expanding chaotically and attempted to include them in efforts to trace the myriad urban phenomena back to a common interpretation, to a rational whole that could be taught and passed on (Muratori, 1963).

In the wake of his teachings, Gianfranco Caniggia provided us with a theoretical model of the forms of urban expansion that was very different to that of Conzen but that could be traced back to the same concepts when it comes to some of his general principles. What are, deep down, the infrastructures that are located on the margins of cities in the Conzenian model, that occupy the empty spaces consisting of cheap land if not the Caniggian model's 'anti-polar' construction? And yet, Caniggia seems to refer, above all, to pre-industrial, organic cities that grow according to a modular law, through successive doublings, where each module is part of a larger urban organism and contributes to its life whilst nevertheless maintaining its original characteristics as a distinct and recognisable sub-organism. If we insist on a comparison, 'mixed land use' areas can be equated to the peripheral arrangements of partially specialised sub-organisms, in direct contact with rural areas, that form during static phases of city construction.

Both these interpretations, which complement each other in the interpretation of fundamental aspects of the expansion of European cities, are products of the cultural areas where they formed. However, both have been recently adapted – more or less explicitly – to the study of other urban areas, such as those of North America or China, which feature very different characters.

Fig. 1 - San Martin das Flores in the state of Jalisco, Mexico. Sixteenth-century Spanish settlement turned into slums by the uncontrolled growth of Guadalajara.

In the early 1960s in North America, specific areas of growth were identified in the expansion on the edges between cities and countryside areas. Gerrit Wissink attempted to classify their typical features with specific characteristics in areas adjacent to the city 'suburbs', and more isolated 'satellite' areas in the territory, also considering their variations: 'pseudo-suburbs' and 'pseudo-satellite' areas (Wissink, 1962).

The study method that had to be employed when interpreting North American urban areas had to take into account particular conditions. The differing mechanism of land value almost always hinders the formation of a fringe belt that can be spatially recognised as a single unified whole. There, a strip of available cheap land where anti-polar infrastructure can be set up rarely forms. The increase in land value, determined by the advantages that a particular location offers, begins decades before such land is actually exploited for construction, hindering that clear difference between rural and urban land values that

encourages the formation of distinct strips of anti-polar construction. Moreover, one should take into account the fact that the greater or lesser marginality of areas of potential city expansion does not depend on their distance from the centre, but rather on complex factors, including their accessibility, which has relevant influence, due to the very nature of American cities.

This situation leads to an early division of properties and a change in the size of building lots, smaller near areas of expansion but with a significantly higher value. The development of fringe belts here is therefore less continuous and often opposite to development in radial strips, sometimes following a linear, though discontinuous, form of expansion along transport arteries and, at other times, a growth of 'clusters' scattered throughout the territory, depending on a method intrinsic to the market-driven rationale of intense speculative activity and few town planning regulations.

The distance from one's workplace, often located in the CBD or at its edges, combined with the extensive use of private transport and the formation of associated large-scale infrastructure, contributes to the complexity of this multi-faceted model of growth that is so hard to generalise. Thus the concept of the *rural-urban fringe* (R-U *fringe*) emerges, understood to mean the transitional zone that, in Western cities, indicates a discontinuous territory and a contradictory landscape on the border between city and countryside, made up of extensive areas featuring specific, recognisable characters. One character that is usually identified with R-U fringe is due to the particular condition of its inhabitants, who live there despite not being part of the place either economically or socially (Herington, 1984). It is, moreover, a structural phenomenon linked to the inexorable growth of the urban population, which has for some time now overtaken the rural population (over 54% in 2017), with a percentage growth that seems relentless. This explains the renewed interest in the concepts of 'fringe belt' and 'R-U fringe', which still seem suited to interpreting the new, uncontrolled phenomena (that are, nevertheless, dynamic and innovative) of the market-led expansion of cities, where new anti-polar structures are often placed beyond the immediate administrative limits not only of large cities but also of small towns, in peri-urban areas that are hardly regulated, occupied by a combination of detached single-family houses and large entertainment complexes, commuter districts and noisy small businesses that cities push to their margins, areas used by undertakers and warehouses of all kinds, shopping malls and venues for large events, concerts and festivals along the edge of farmland.

Fig. 3 - Planned ridge routes in the expansion of Los Angeles.

The fact that concepts that have now become traditional, such as those of the fringe belt and R-U fringe have, for some time now, been placed at the centre of design project instruments for areas in urban expansion, succinctly tackling spatial as well as political and social problems, is proof of the attempt to establish the latest town planning frontier, limiting the fragmented city (Gallent, 2006).

However, we cannot deny that the idea of limits, which once constituted one of the pillars of urban studies from the post-war period on, is now definitively in crisis, together with that of a perimeter, which was not only used as a planning tool but also as a mindset, allowing us to establish distinctions and borders.

Nevertheless, I believe that architects and town planners are not allowed to accept reality as it is (contrary to the aesthetically pretentious movement that has recognised in the disintegration of every order the representation per se of the modern world). Often disorder, if observed methodically, contains its own explanation, multifarious aspects of manmade principles that can be recognised and analysed rationally.

In any case, the model used to interpret and critically explain the phenomena of urban expansion is not just a scientific tool: it is also knowledge in action, it contains a design project. I believe we need to 'designedly' seek out the form of cities that expand, even in their seemingly chaotic, formless parts (Strappa, 2012).

This book compares and contrasts a number of essays on urban expansion that examine case studies located in various different geographic areas: from Europe to Asia, from North to South America. It

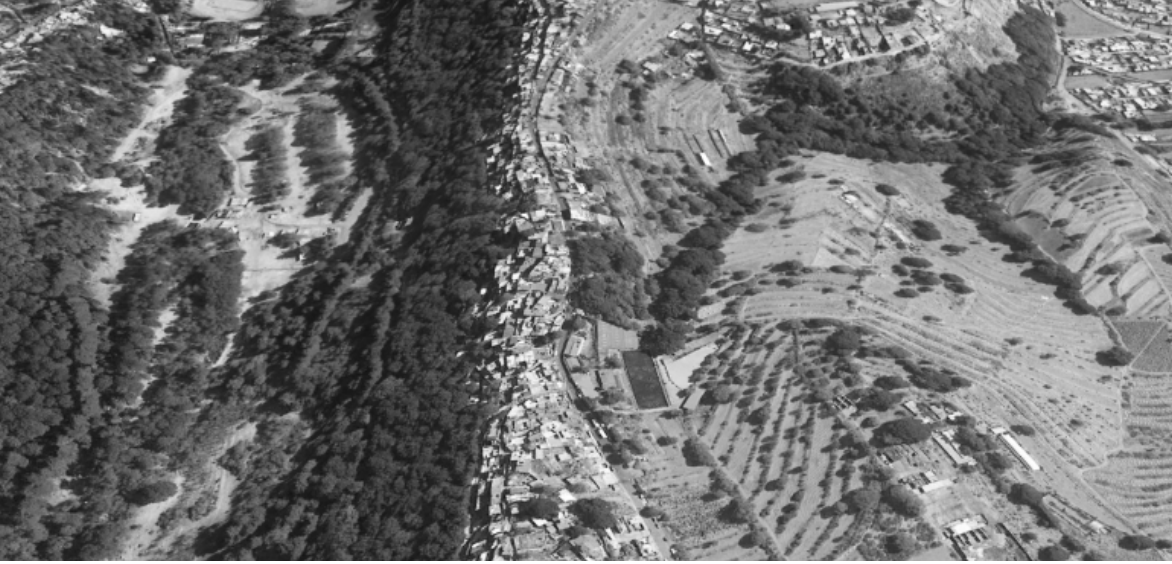

Fig. 4 - Spontaneous ridge routes in the expansion of Mexico City.

is not, however, just a comparison of urban samples. What interests the editor is to compare interpretational models derived from experience that come under the umbrella of Urban Morphology, developed in different cultural contexts that nevertheless share the conviction that the form of a city, even in its most seemingly chaotic incarnations, can be interpreted rationally and contains the seeds of future change.

References

Caniggia, G., Maffei, G.L. (1979) 'Composizione architettonica e tipologia edilizia 1.Lettura dell'edilizia di base' (Marsilio, Venezia).

Conzen, M.R.G. (1960) 'Alnwick, Northumberland: a Study in Town-Plan Analysis' (Institute of British Geographers, London).

Gallent, N., Andersson, J., Bianconi, M. (2006) 'Planning on the Edge' (Routledge, London).

Herington, J. (1984) 'The Outer City' (HarperCollins, New York).

Lammers, D., Pereira Roders, A., Van Wesemael, P. (2016) 'Radial fringe belt formation', Proceedings of the 22nd ISUF Conference, Rome 2015 (U+D, Rome).

Muratori, S. (1963) 'Architettura e civiltà in crisi' (Centro Studi di Storia Urbanistica, Roma).

Strappa, G., ed., (2012) 'Studi sulla periferia est di Roma' (FrancoAngeli, Milano).

Strappa, G. (2014) 'L'architettura come processo. Il mondo plastico murario in divenire' (FrancoAngeli, Milano).
Strappa, G., Carlotti, P., Camiz, A. (2016) 'Urban Morphology and Historical Fabrics. Contemporary design of small towns in Latium - Morfologia urbana e tessuti storici. Il progetto contemporaneo dei centri minori del Lazio' (Gangemi, Roma).
Whitehand, J.W.R. (1967) 'Fringe Belt, a Neglected Aspect of Urban Geography', *Transactions of the Institute of British Geographers 41*.
Whitehand, J.W.R., Gu, K. (2017) 'Urban fringe belts: evidence from China', *Environment and Planning B: Urban Analytics and City Science 44*.
Whitehand, J.W.R., Morton, N.J. (2006) 'The fringe-belt phenomenon and socio-economic change', *Urban Studies 43*.
Wissink, G.A. (1962) 'American cities in perspective' (The Humanities Press, New York).

Metropolis in transformation

A study of fringe belts in Belo Horizonte, Brazil: a contribution to developments in urban morphology

Staël de Alvarenga Pereira Costa, Karina Machado de Castro Simão

The object of this paper is to reveal aspects of a research project which was carried out in order to identify the fringe belts in Belo Horizonte, a planned city whose geographical context differs from the sites at which traditional studies have been developed. The study of fringe belts is relevant as it can contribute to the identification of each phase and development of the urban form and the morphological function associated with its configuration within the contemporary city. Traditional studies have been undertaken in European and American countries, but few have been done in Brazil. This research, by way of comparison, has thus aimed to verify if fringe belt development in a Brazilian city has followed a comparable trajectory and manifested similar characteristics as those identified in the traditional studies. The latter have contributed to the elaboration of methodological procedures which have allowed database identification and their associated field surveys. A general study of the urban evolution of the municipality was then carried out with a focus on mapping out the units and charting their overlaps during different morphological periods. This, in turn, has facilitated the classification and the identification of possible ring formations which have been recurrent in the traditional studies. Thus, the approaches utilised in this project hope to offer insights and raise new questions through a case study which contrasts with the tra-

ditional research that is being referenced in other currently running Brazilian projects.

Introduction

The urban landscape is structured by morphological elements which include blocks, plots, roads, buildings, open spaces and fringe belts. (Conzen, 2004) These latter elements have physical characteristics such as, vegetated open spaces, occupation of buildings for institutional use or non-residential urban landmarks and sparse road networks, with a low incidence of radial roads and low penetration of vehicles. Cemeteries, parks, villages, military installations, schools, hospitals, golf courses, football fields, monasteries all constitute examples of fringe belts. These morphological elements are classified, according to Conzen (1960), as inner, middle and outer in relation to their development over time and location.

Discovering the existence of fringe belts within cities has become a challenge that urban morphologists currently face in their studies. Fringe belts can be viewed as products of cycles of economic development due to the existence of certain elements that occurred at the time they were formed and which contributed to constraining the urban frame within or outside the urban fringe. Fringe belts located on vacant land can perhaps be seen as potential areas for green belts or turned into public spaces for recreation and parks. Their study furthermore provides a base for a historical and geographical framework in urban morphology, since it permits the identification of the urban form's stages of development which are in turn intimately related to the physical configuration of the contemporary city.

Brazilian urban morphologists have been interested in researching such phenomena and in discovering if elements can be used to enhance the urban form of the city. Research has thus been developed in several Brazilian cities including Belo Horizonte.

This paper presents the evolution of the city and discusses whether during development, fringe belts were created within the urban fringe. In order to identify fringe belts in the city, a review on the theme and a mapping of the units were carried out according to the precepts of the studies elaborated by Conzen and his followers, Whitehand, J.W.R. (2001), Whitehand, J.W.R., Morton, N.J. (2003), Whitehand, J.W.R., Morton, N.J. (2004), Whitehand, J.W.R., Morton, N.J. (2006), these being based on their main characteristics (low density and in-