

Durand, J-N. L. (1800) *Recueil et parallèle des édifices de tout genre, anciens et modernes: remarquables par leur beauté, par leur grandeur, ou par leur singularité, et dessinés sur une même échelle* (Gillé fils, Paris).

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**Building types and built forms** by Philip Steadman, Matador, Kibworth Beauchamp, UK, 2014, 424 pp. ISBN 978 1783062 591

Over a span of half a century Philip Steadman has addressed such varied fields as art history and environmental engineering, and architectural history and the mitigation of catastrophe risks. All of these topics have been approached with the same methodological rigour (Steadman, 1990, 2001). The focus, systematically placed on logically formalizable and quantifiable features such as structural similarities, geometrical or topological relationships in space, statistical correlations between dimensional characteristics (for example, floor area/built volume), reflects affinities with the structuralist school as well as precocious skills in what has come to be called digital humanities. Since the early 1970s Professor Steadman has been able to anticipate, together with the British mathematician, architect and artist Lionel March, the heuristic potential of computerization both for the systematic treatment of compositional challenges and the survey of existing built complexes (Steadman, 1971). His early contributions to the morphological study of architectural layouts developed in close continuity with the approach Christopher Alexander presented in 1964 in his famous *Notes on the synthesis of form* and also in intellectual affinity with the circle of space syntax around Bill Hillier at UCL (Steadman, 1983).

In addition to numerous case studies and very specific explorations, Steadman has authored essays of a more philosophical range, questioning analogies and essential differences between artefacts and living organisms in respect of their behaviour through time (Steadman, 1979) or attempting to circumscribe, from a quite metaphysical standpoint, the transient areas between probability, possibility and radical impossibility in

architectural design. This last issue is already present in his *Architectural morphology* (Steadman, 1983). In refined clarity, at the core of the present book, it explains the meaning and uses of the concept of 'morphospace' through a series of applications.

The most valuable outcome of the present study resides in the clear distinction between the narrative reporting of historical facts and events and the attempt to explain these within an explicit theoretical framework. Care is taken to disentangle the institutional definition of buildings as receptacles of activities ('activity types', like hospital, theatre, church, station) and the classification of buildings according to intrinsic formal geometrical properties ('form types', like pavilion, block with or without courtyard, detached or semi-detached house). The author emphasizes that the relationships between building types and built forms, that is between uses or functions and certain spatial arrangements, remain very flexible through time: a built form developed in the context of museology may obtain further applications in the realm of medical care, penitentiary punishment or retail marketing; conversely a specific function – such as housing – may be compatible with the broadest range of built forms including those initially dedicated to other purposes (for example, residential lofts in former storehouses).

All odd-numbered chapters focus on selected episodes of the building developments triggered by the industrial revolution in the UK and USA. Chapter 1 compares four London residential buildings of the later-nineteenth century. Chapter 3 relates the fate of Florence Nightingale's pavilion hospital. Chapter 5 observes the gradual replacement of 'central hall plans' by 'pavilion plans' in elementary school building between 1870 and 1930. Chapter 7 compares the rise of tall office buildings in Chicago and New York between 1890 and 1930, paying particular attention to the site. Chapter 9 closes this series of case studies, recording the genesis and organizational refinements of panoptical prisons since the last decades of the eighteenth century. A common feature of those chapters is the emphasis on the various individual and collective actors, inventors, and commissioners – upon all those people, who seem to be the exclusive bearers of 'historical agency' because of their permanent involvement in practical choices.

The even-numbered chapters enlarge the perspective in order to include what the author calls the 'morphospace', which is the backdrop of

possibilities and structural constraints that underlies practical choices. Chapter 2 displays the dimensional and distributive constraints, which result for residential building from the need to have daylight and independent access to each room. Indeed, if each room has to be day-lit, there are only four possible access patterns. Chapter 4 revisits the figures of David Steingruber's famous *Architektonisches Alphabeth* and convincingly clarifies why those layouts are not just the pipe dreams of a Baroque imagination, but the systematic display of the possible ways to combine and articulate wings around courts. The demonstration leads to a generative grid or matrix, which the author calls 'archetypal building'. This matrix unfolds from the orthogonal interweaving around free spaces (courtyards) of three-part strips, each having two day-lit zones on both sides of an artificially lit corridor. This matrix allows not only catching the basic geometrical and distributive (or topological) features of a major part of the built production, but also mapping in a binary code adapted to further computerized treatments, as exposed in the key Chapter 6. In this chapter, Steadman acknowledges his methodological debt to the American palaeontologist David Raup, who first coined the concept of 'morphospace' in the 1960s.

Chapter 8 reaches a further grade of complexity in the modelling of the generative rules of built forms, as it starts to take urbanistic parameters into account. The formal variations displayed by tall buildings in New York as compared with those in Chicago are set in causal relationship with differences in the geometry and size of the respective street blocks as well as with differences in the respective plot division systems. Also the ways actual buildings differ from the theoretical envelope allowed by the public ordinance ruling in each city are analysed. Various quantified parameters, such as density of plot occupancy, volumetric compactness and energy consumption, seem to confirm a permanent concern of developers about land-use maximization, balanced by building and operating cost minimization. Addressing those issues, Philip Steadman falls into line with Meta Berghauser Pont and Per Haupt, from whom he borrows the 'Spacemate' tool already presented in this journal (Berghauser Pont and Haupt, 2007). Chapter 10 engages in another scientific dialogue, this time with architect Michael Benedikt, in order to give a geometrical explanation of the failure of Bentham's panopticon. The 'Isovist' tool, that serves to calculate 'the three-dimensional volume

of space that is within sight' (p. 319), allows it to be demonstrated that the circular layout of Bentham's multi-storey panopticon did not warrant such complete oversight as the radial prisons could achieve 30 years later.

The last two Chapters, 11 and 12, provide concluding summaries still according to the aimed methodological disentanglement between empirical knowledge of the particular and theoretical explanation of general principles. Chapter 11 restates the need to distinguish between 'activity types' and 'built form types' in order to grasp their dialectical interplay through time. The author's observations about copying or reproducing 'form types' in building practice would be worth deliberation not only against the background of evolutionary theory in the natural sciences but also in the setting of the recent metaphysics of artefacts (Franssen *et al.*, 2014; Thomasson, 2009). Chapter 12 answers the challenging question regarding what changes and what remains invariant in built forms through time, which unavoidably arises at the core of every contribution committed to the structuralist approach: '... there is a key difference between possible configurations and possible dimensions. The first are determined by the laws of geometry and topology, which do not change with time. The result is that the possible configurations mapped by morphospace remain always the same. The limits on possible dimensions on the other hand can be shifted by innovations in technology introduced at different dates' (p. 396).

This remarkably well organized book, in which the author has succeeded in both assembling and updating most of the results of his past inquiries, is one of the most inspiring works an urban morphologist could read. It offers at the same time useful methodological tools for the comparative analysis of built forms, illuminating insights in the course of history and precise conceptual distinctions for a deep understanding of the challenges of architectural and urban design at the intersection of science, technology, art and the humanities.

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**Atlas of the Dutch urban landscape: a millennium of spatial development** edited by Reinhout Rutte and Jaap Evert Abrahamse, THOTH Publishers, Bussum, The Netherlands, 2016, 303 pp. ISBN 978 90 6868 690 6.

The Netherlands is the most densely urbanized country in Europe. This outstandingly designed, and very beautiful atlas provides a synthesis of a millennium of urban spatial development for the 35 largest Dutch towns, as they were in 2010, when the research for the atlas began. The book derives from a joint project of the Cultural Heritage Agency of the Netherlands and the Faculty of Architecture, Delft University of Technology and was first published with a Dutch text in 2014. It rightly attracted reviews giving it the highest praise. This revised edition in English gives its findings wider circulation in the scholarly community, as well as amongst the general public. It is a book that is overtly embedded in the work of urban morphologists and the techniques of town-plan analysis, and also aims to revive the Dutch contribution to the *European Historic Towns Atlas* project for the modern age by using GIS and computer-generated graphics, together with comparative study.

There is a brief introduction setting out the parameters of the study, and a rather longer concluding chapter which sets the story of Dutch

towns into their broader European perspective of long-term patterns of urbanization, the chronological phases of that urbanization, and the nature of urban planning practice. The remainder of the atlas is divided into two main sections. The first provides an analysis of the development of each of the 35 towns to a common format. That format is dominated by full colour images; text is provided only to explain the images. Each town survey has within its four pages a chronological development map showing its growth phases for fixed cross-sectional years from AD 1200 to 2010 to a common scale; a schematic outline map showing landscape features that were significant shapers of the urban forms; a *Google Earth* photograph of the town in its immediate setting with district and topographical names used in the text added; a timeline showing the most important aspects of the town's development through time; two characteristic images such as a seventeenth-century topographical painting and a recent oblique air photograph; and a brief text explaining the town's spatial development.

Following this presentation of the basic data of the study, part two of the atlas presents a chronological analysis of the urbanization process in the Netherlands. It begins by providing a classification based on the origin, spatial development and landscape setting of the towns. This uses the maps, and timelines from part 1. This results in five urban categories: the oldest towns; second generation towns; the 'big three'; industrial towns; and residential towns. Then Dutch urban development is examined across four successive time periods so as to tease out common morphological factors and variations in urban planning practice. In these chapters chronologies are shown on a base map of the Netherlands. So, for example, in the first period, 1000–1500, it is immediately clear that location on a major waterway was a key factor in successful urban development. By 1350 the forms that constituted a flourishing town had been devised and most of the sample in this category (20 towns) expanded their plan area in the fourteenth or fifteenth centuries as the Dutch economy flourished. Seven different plan forms are discerned and parcellation patterns in a sample of eight towns are presented. The two subsequent periods are 1500–1850, for which most of the analysis concentrates on the earlier part of the period, and 1850–1950, during which the improvements to the infrastructure of roads, railways and port facilities were critical in the revival of towns during industrialization. There are some fascinating reproductions of inter-war