SUMMARY

Doctoral student: Elwin Alexander Koster
Provisional date of defence: 7 June 2001
Promoters:

Prof. Dr E.R.M. Taverne (RUG) and Prof. Dr J.W.R. Whitehand (Univ. of Birmingham)

Title of doctoral thesis:

Stadsmorfologie. Een proeve van een vormgerichte benadering van stedenbouwgeschiedenis

(Urban morphology. A taste of a form-oriented approach to the history of urban development)

English summary

This study of the history of urban development deals with methods and techniques of urban morphological research and the automated processing of the cartographic source material that is of importance to this research. The structure is tripartite: the first part furnishes a historiographic insight of European urban morphology on the basis of a brief historiography of three important groups; the second covers the most important source, the problems related to this and the solution by means of a digital atlas; finally, the third part deals with a case study of a short period in the spatial development of the City of Groningen, in which several of the methods described in the first part are deployed.

The three most important research groups within the field of urban morphology were brought together in 1994, with the foundation of the International Seminar on Urban Form (ISUF). Prior to this, there had scarcely been any contact between the British geographers and the French and Italian architects, despite the fact that the methods used by these groups were rather similar. Since its foundation, the ISUF has grown into a complex network. This study is confined to the origins and the evolution of the three European approaches, focusing upon their founders: Conzen (UK, geography), Muratori (Italy, architecture), Castex and Panerai, Huet and Devillers (France, architecture). A fourth description has been added to these three: of the research group formed around Chastel and Boudon, which carried out a large-scale research project in the 1970s and 1980s on the development of the area around
the market halls of Paris. Although this group occupies a position outside the ISUF, its activities are of great importance with respect to the historic urban-development point of departure of this study.

The British geographical tradition has its roots in the German urban research performed at the beginning of the twentieth century. The founder of what later came to be known as the Conzenian tradition received his education as a geographer in Berlin, where he became interested in the ideas and beliefs of geographers such as Bobek, Hassinger, Schlüter, and Geisler. As a consequence of his forced emigration in 1933, Conzen arrived in England, where it actually took until the nineteen-fifties before he returned to the domain of urban morphology. On the basis of systematic typological analyses of settlements, he developed a research method oriented towards spatial development, which he presented in his study on Whitby (1958) and especially in his book on Alnwick (1960). In these studies, Conzen introduced the term ‘townscape’ as the object of research - the three-dimensional form of urban space. Analysis of the townscape occurs at three levels: the ground plan, the built-up surroundings, and the use of the space. Particularly the first element is elaborated in his later studies. A vital ingredient of Conzen’s analyses is the fact that he begins with the earliest reliable map of the area, from where he attempts to penetrate down to the origins of the settlement. The major components of his analysis are the Burgage Cycle and metrological analysis. Metrological analysis plays a key role in research performed by Lafrenz, who analysed a seventeenth-century planned city, and research carried out by Slater on planned settlements in medieval England.

From the 1950s onwards, the architect Muratori, who is associated to the Istituto Universitario d’Architettura di Venezia, performed research on the typology of houses and the location of these in the city. With the notion that the city is the material precipitation of cultural developments, he examined the active history of the city on the basis of the objects built. With cartography as the most important instrument, he did this in two ways: by means of cultural-historical maps on which the typical character of a period is filled in, and by means of a structural-historical reconstruction of the individual house. This research, with the corresponding maps, was published in two studies, the first of which dealt with Venice and the second with Rome. After Muratori’s death, his method was further refined by one of his students: Caniggia. Caniggia’s particular contribution lies in the analysis of the changes that take place in the ideal type. The typology process is primarily concerned with
making the structures visible at various scale levels, in order to be able to reproduce these.

The historical morphological research performed by Chastel and Boudon is directed towards ‘common’ architecture, just like the Italian research. The central focus of this research concerns the embedding of this common architecture in the urban tissue and the changes this brings about at plot level. The research takes place by means of statistical analyses geared to processes such as the tightening of the urban tissue, changes in the shape of the plots, and appraisal of the architectural form belonging to the particular plot. All these processes are repeatedly placed in the context of the contemporary cultural circumstances. The use of both written and graphic sources as material for the analyses is of fundamental importance to this study.

The French architectural research is partly based on Italian ideas on typo-morphology but has a more theoretical-normative approach. The research performed by Ladrhaus has its origins in Italian architectural research and in American sociological research. An essential part of the method is the ‘reading’ of the spatial disposition as a direct result of earlier transformations. The method becomes expressly clear in the analysis of the spatial form of Versailles (1980), in which urban changes are described as a dynamic social and spatial process. The second research school, IPRAUS, takes the Italian research by Aymonino and Rossi as the basis of the typomorphological research. The revaluation of the concept of architectonic typology is the central issue here. The study on the industrial town of Le Creusot illustrates that the historical stratification has to be analysed step by step in the context of socio-economic values.

Cartography, as a representation of a specific stage in the development of a townscape, plays a major role in all the methods described in Part 1. Part 2 covers the problems that emanate from making use of this source. The reports of two congresses demonstrate that the use of the urban plan as a historical source is not without snags. The lack of a specific source-criticism and of standardisation is the most serious obstacle here.

Three projects in which the ground plan formed the most important source have been significant in the definition of the problems that occur with the standardisation of source material. In 1933, Van Eesteren proposed a far-reaching standardisation of source material for the study
of the functional town. Although maps of towns were only presented in this way on a single occasion, the guidelines form an important point of departure in considering standardisation for the purpose of comparative urban research. In 1955, the working group for historical town atlases was founded with the objective of producing atlases suitable for the comparative study of urban ground plans. Now, 45 years later, comparison of the atlases actually produced shows that the strict guidelines were not consistently implemented, so that no homogeneous series was fabricated. A third project started in 1994 with the aim of uniformly charting a broad range of research data for urban research. In contrast to the historical town atlas project, this project does not concentrate on the primary source but rather on the uniform presentation of results for the purpose of further research. Problems that occur in each of the projects mentioned are largely related to the polymorphism of the material. The solution presented in this study lies in the automated processing of the material into a digital atlas.

The reliability of the material used is of vital importance to historical morphological research. The use of the earliest reliable map in British urban morphological research poses great problems for the researchers. After all, how can one determine the reliability of this historical source? Attempts are being made, from the points of view of both the cartographers and the historians, to generate a source-criticism that can establish the authority of a cartographic document. This authority is the point of departure for the choice of material for historical urban research.

The most important instruments for the creation of a digital atlas are geographical information systems that enable the combination of spatial and non-spatial data within one system. However, such systems are not directly deployable for the processing and analysis of historical cartographic material due to problems that occur with the input of the material. This study describes the specific input method for historical cartographic source material. A major part of this method consists of the registration and rectification of maps so that these can be converted to a similar scale and orientation. Both grid and vector images are processed in this way. There is a serious problem with maps that were drawn before 1800. As a consequence of the customary method of charting the area, there is a gradual decrease in reliability towards the periphery. The method developed for this research makes it possible to rectify these maps too, on the basis of a modern map of the urban area: the digital large-scale basic map. An important element in this process is the
determination of the points that are used in the registration – these must be identical on both maps. Historical research on such positions in the city is a crucial point of departure.

This study has produced a significant result with the digital model of the City of Groningen in three dimensions, which has been created on the basis of data on manhole covers, as made available by the Urban Planning Department of the Municipality of Groningen. The other points have been ascertained by means of interpolation, and a correction has been made to allow for the elevation of the street level caused by the cultural layer. This model can be used as a fundament for other maps that can thus assume the three-dimensional ground form.

In the third part, some of the morphological methods, as described in the first part, are reviewed against a small section of the City of Groningen: the extension of the city northwards, which was ratified at the beginning of the seventeenth century. The first chapter deals with the context in which this extension took place. A general picture is sketched on the basis of a short description of the socio-economic and spatial history of the circumstances under which the decision to expand was made. A separate section of this chapter discusses the available written and graphic sources that are relevant to the third part.

Various morphological studies indicate the significant influence of the ground and soil upon the planning process. The pre-urban parcelling is of great importance in determining the starting points for the construction. A reconstruction of this parcelling and the water management situation in the relevant area has been made on the basis of written and graphic sources. A parcelling structure of small strips to the north of the city is clearly visible on maps from the end of the nineteenth century. This parcelling is not shown on early cartographic material, the maps drawn by Jacob van Deventer and Nicholaas Geelkerken. However, archaeological research in the area to the north of the Grote Markt and the Vismarkt in the centre of the city do show a similar strip-type of parcelling. A section of this chapter is devoted to the nomenclature in the area of the later expansion. This largely deals with the discussion that was held in the sixties on the toponym ‘Tie’ and its possible location.

With the diversion of the River Hunze closer to the city via the Schuitendiep at the beginning of the fifteenth century, the basis was created for an economic policy in which all trade would take place via the
City of Groningen. However, the necessary portage in the Boterdiep remained a problem. This problem was tackled with the city expansion, as various documents indicate. This study describes this decision and its direct consequences as a component of the planning process.

In order to fully comprehend the planning process, it is essential to appreciate the influence of the city fortifications on the ultimate shape of the city. By combining various elements, this study wishes to provide an impulse towards a reconstruction of the plan and the physical implementation of these works. For this purpose, the education and theoretical backgrounds of engineers and surveyors at the beginning of the seventeenth century are also covered. An introduction to the practical background to the fortifications is furnished on the basis of two treatises, with the objective of giving the researcher tools to analyse the influence of the fortifications on the shape of the city.

Various interested parties participated in the planning process in Groningen. The States General (Staten-Generaal), Willem Lodewijk, and Prince Maurits had vested interests in a solid bastion in the north of the country. The city fathers wanted to encourage economic growth. This study brings together the various available sources that give a picture of this complex process in which occasional conflicts of interest are finally centralised in a definitive plan that was approved in 1615. At the same time, this study also indicates that, originally, there were no plans to extend the city.

The ultimate plan, as formulated in 1615, has not survived. A reconstruction of this original plan has been made using the available sources. This reconstruction is based on the theory in the treatises and on the eventual shape. Accordingly, it can be demonstrated that the origin of the urban shape of Groningen is based on an ellipse.

The actual erection of the fortifications can be reconstructed on the basis of a number of written documents, including a few concrete specifications. These sources allow insight into the course of the work, the contractors involved and their tasks, and the corresponding costs.

The chapter on the civil structure of the new urban extension is the point at which a limited number of methods, as described in the first chapter, are applied. The chapter is an attempt to reconstruct the original parcelling as was ascertained in 1617. This reconstruction takes place on the basis of the first cadastral detailed plan and a register of leasing.
valid for a limited number of years. An important issue is the extent to which one can speak of an ideal parcelling set-up. Previous chapters have already indicated that the landscape, city fortifications, and economic factors were probably more significant factors. The infrastructure outside the new city walls seems to have been scarcely adjusted, so that an irregular infrastructure must have arisen in which only the connections between the old and the new city gates were straightened.

The parcelling within the new street pattern also appears to have been far from regular. A metrological analysis has been carried out on the basis of the first cadastral detailed plan and the reconstruction made. This analysis shows that the standard measurements prescribed by the city fathers were not taken as the point of departure, and that speculation played a role in the ultimate parcelling, although to a lesser extent than in other cities in the Netherlands for as far as we know.

The three computer reconstructions generated for this study – the three-dimensional model, the reconstruction of the fortifications, and the reconstruction of the original parcelling set-up – form the basis of this study. These maps, which arose by combining diverse kinds of sources, also form the point of departure for further urban morphological research. As such, this study is a methodological framework for further research on urban forms that is not only applicable to Dutch cities but to urban development in general.