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Marjatta Hietala

SERVICES AND URBANIZATION
AT THE TURN OF THE
CENTURY

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SERVICES AND URBANIZATION
AT THE TURN OF THE
CENTURY

The Diffusion of Innovations

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For Niko, Mari and Virve

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Preface

My interest in the research of services had already been awakened during my studies of history, sociology and statistics at Helsinki University but such interest was considerably deepened when working, in the 1970s, as a research official in the Prime Minister's Office and at the Ministry of the Interior. At that time a new centre network classification was being prepared for Finland and plans were being made for growth centres. In this work it was necessary to co-operate with experts from various fields and, when exploring services in particular an interdisciplinary approach was required. In the course of various projects I was involved in close co-operation with geographers, social scientists and planners of various kinds. What we missed then was a knowledge of the origins and development of services and their links with the decision-makers' value systems and with economic and political factors.

My training in general history was bound to lead me deeper, however. Going back some hundred years I decided to investigate the birth of services during the period of most intensive urbanization. At that time, towards the end of the 19th century, infrastructural, health and educational services were established, which are all crucial to our modern service society. In due course such developments in the towns and cities of Central Europe became the subject of this study and, of the comparative material available, that concerning German cities at the turn of the century was the most systematic. Some evidence of the influence of the latter is provided by the extensive quantity of German municipal statistics which actually reached Finland where decision-makers showed a considerable interest in them.

The years 1890 to 1912 proved so fruitful a research period that I decided not to expand my investigation to cover the

period after the First World War. During those years Europe was a truly international territory where openness of communication prevailed, inspiring research both then and later. This international network for the exchange of ideas also included Helsinki, the only large city in Finland.

Many people have helped me with this book in a variety of ways. I take pleasure in thanking them here. I am grateful for the advice and information obtained from seminars and meetings in the following institutions: Institut für vergleichende Städtegeschichte (Münster), Stadshistoriska institutet (Stockholms universitet) and Geschichtliche Landeskunde (Universität Trier). In this connection I am particularly indebted to Professor Hans Jürgen Teuteberg and Professor Heinz Heineberg (Münster), Professor Ingrid Hammarström and Docent Birgitta Ericsson (Stockholm) as well as to Professor Franz Irsigler (Trier). I am also grateful for fruitful discussions with Lord Briggs (Oxford), Professor Anthony Sutcliffe (Sheffield), Professor Paul Slack (Oxford), Dr. M. J. Daunton (London), Professor Hans Heinrich Blotvogel (Duisburg), Dr. Christian Engeli (Berlin) and Professor Jürgen Reulecke (Siegen).

As a member of the Commission internationale pour l'histoire des villes I have had the opportunity to take part in high-level discussions on the history of European towns. I appreciate especially the encouragement that my predecessor in the Commission, widely known townhistorian Academician Eino Jutikkala has given to me over the years.

I also wish to express gratitude for valuable criticism of various parts of the manuscript to Dr. Günter Löffler (Trier), Dr. Heinrich Johannes Schwippe (Münster), Professor Kalervo Hovi (Turku), Professor Aira Kemiläinen (Jyväskylä), Professor Erkki Pihkala (Helsinki), Professor Pekka Suvanto (Helsinki) and Pol.lic. Kari Hietala. But naturally I alone am responsible for any defects in what follows.

As for assistance in the actual research the work of Jaakko Pöyhönen has been particularly invaluable. He has played a key part in the entire project and helped with the computer analysis. In various stages of this study I have also received generous help from the following: Tarja Forsberg, Aulikki Litzen, Tuire Raitio, Marjatta Tikkanen, Marko Auer and Kristiina Graae. Lena Törnblom prepared the diagrams.

Particular gratitude must also go to the translators of this work, Marjatta and Robert Bell and Jyri Kokkonen.

Without financial support from the Academy of Finland the completion of this research would not have been possible. Since 1981 I have worked as a Senior Research Fellow for the Research Council for the Humanities of the Academy of Finland and it has also provided me with bursaries for a number of trips abroad. An exchange scholarship from the British Academy made it possible also for me to spend an extended period in London. The Finnish-Swedish Cultural Fund also deserves thanks for the financial support of trips to Stockholm.

For a scholar one's working community and the inspiration of colleagues are the prerequisites for bringing one's research to full fruition. I have found this kind of community in the Helsinki University Institute for Historical Research and Documentation as well as in the Library of the Central Statistical Office of Finland.

Finally my warmest thanks to the Finnish Historical Society, which has included my study in its series of publications, and especially to its energetic Executive Director, Rauno Endén.

Helsinki May 15th, 1987

Marjatta Hietala

"We do not appreciate the possibilities of city life. But there are cities that justify hope; cities that are administered by trained officials; cities that are built by far-seeing statesmen and that consciously promote comfort, convenience, happiness, life. Such cities are to be found in Germany, and in a less developed degree in the other countries of Europe as well."

Frederic C. Howe, European Cities at work, London 1913, p.Viii.

1. Introduction

"The Municipal Exhibition organised at Dresden, the capital of Saxony, is attracting a great deal of attention in Germany, but its interest is not confined to that empire. Members and officials of local authorities will profit by a visit to the exhibition, which continues open to the end of September.

The object of the exhibition is to illustrate the methods of municipal government in German Cities in the Twentieth Century — the leading German Cities, 28 in all, in particular. None of them have a population of less than 25,000, and they represent 13 millions of people. By means of diagrams, models, literature and statistics visitors are enabled to study the present state of municipal administration in all the great German cities, including Berlin, Bremen, Breslau, Cassel, Charlottenburg, Chemnitz, Danzig, Darmstadt, Dresden, Düsseldorf, Elberfeld, Essen, Frankfurt, Hamburg, Hanover, Heidelberg, Cologne, Leipzig, Lübeck, Munich, Strasbourg, Stuttgart, Weimar, Wiesbaden and a number of others. The subjects covered include:

- a. Town development, building regulations, dwellings, &c;
- b. Communications, lighting, street-making, drainage, bridges and harbours, tramways, &c;
- c. General care of public health and well-being, also police arrangements;
- d. Schools and education;
- e. Care of poor and sick, conduct of hospitals, &c;

f. Rates, industrial undertakings belonging to towns, ground ownership, savings banks and pawnbroking.”¹

According to observers the Dresden Exhibition in 1903 showed the tremendous progress which had taken place in municipal development in Imperial Germany. Some even compared this change and progress in the German cities with the change caused in Great Britain by the industrial revolution. A correspondent of the *Municipal Journal* returned to the topic a year later, in 1904, and wrote an article on the exhibition with the headline "Municipal Enterprise in Germany, the New Era and its work" commenting as follows:

"The Dresden Exhibition of German Towns of last year has served to remind us what a remarkable change, under the stress of her industrial development, the town life in Germany has undergone within the last generation or so. It is not too much to say that excepting the period of the great industrial revolution in England in the latter half of the eighteen century, nothing like the tremendous growth of towns in Germany within the short period specified has ever been witnessed in Europe in modern times... It was a sort of documentary evidence of that fact that the centre of gravity of economic and social life in Germany has now definitely shifted to towns, and that municipal government there is fully alive to the new responsibilities which have thereby been imposed upon it. It is certainly a thousand pities that we in England have never thought of organizing a short, living review of municipal work such as the Germans have held at Dresden, in order to sum up our successes, scrutinize our gaps and defects, and co-ordinate our municipal efforts in future.”²

The Organization Committee of the Dresden Exhibition had decided specially to invite the authorities of the most important cities of North America, England, France, Holland, Belgium, Austria-Hungary, Italy, Denmark, Sweden, Russia,

1. Dresden Municipal Exhibition, *The Municipal Journal* 14.8.1903, p. 732.

2. *Municipal Enterprise in Germany*, *The Municipal Journal* 19.2.1904, p. 147.

Spain and Switzerland to visit the exhibition and to take part in its inauguration.³ Because the exhibition was generally accepted as unique and the first of its kind the city of Stockholm sent several delegates to Dresden while Helsinki sent her municipal engineer.⁴

In Germany generally and at the exhibition in particular the Nordic visitors were especially interested in everything related to sanitary provision and the infrastructure as well as policing, institutions of schooling and instruction, public libraries and reading rooms, for these matters were particularly topical because of the expansion of Nordic towns.

Many of these municipal activities fall into a common category 'Municipal Enterprise or Municipal Trading', a topic under serious debate all over Europe, but in Great Britain in particular at the beginning of the 20th century. At that time Germany was widely mentioned as a positive model.

What in fact was the standard of services in those German towns and cities that were the subject of such frequent study trips? Why was there such a flow of visitors coming from other parts of the world to continental Europe and to Germany in particular? How was it possible that Germany where urbanization was a relatively recent phenomenon had been able to achieve such a high standard?

In the 19th century an entirely new phenomenon, a new kind of city emerged, based on productive power, mass population and industrial technology. It is these cities which have been given the credit for creating a system of social life founded on totally new principles. The phenomenon of urbanization has attracted much of the attention of researchers and the concept of urbanization alone has given rise to quite an extensive number of studies.⁵

3. The Municipal Journal 10.4.1903, p. 364.

4. Helsingin kaupunginvaltuuston arkisto, Pöytäkirjat liitteineen Ca: 29, 1903; Helsingin kaupungin rahatoimikamarin arkisto, Kirjetoistheet, Da: 28, 1903, Helsinki City Archives.

5. Literature concerning the development of urbanization is extensive. Recent decades have seen the publication of a number of compication works discussing various aspects of this topic and relevant research.

The following are nowadays regarded as classics: Oscar Handlin and John Burchard (eds.), *The Historian and the City*, Cambridge Mass. 1966;

By urbanization is usually meant the greater concentration of population and places of work, linked to a more varied industrial and commercial life. The town is a relatively densely inhabited and administratively defined separate unit, whose inhabitants earn their living from means other than agriculture.⁶

The following aspects are generally considered characteristic of the birth and development of a town: the size of the total population, the control over natural environment, technological development and developments in an advanced social organization.⁷

Hugo Preuss, an influential German writer, analyzed the conditions for urbanization suggesting that technology and

H. J. Dyos (ed.), *The Study of Urban History*, London 1968; Philip M. Hauser and Leo F. Schnore (eds.), *The Study of Urbanization*, New York 1965; Philip Abrams and E. A. Wrigley (eds.), *Towns in Societies. Essays in Economic History and Historical Sociology*, Cambridge 1978; Andrew Lees (ed.), *The Urbanization in European Society in the Nineteenth Century*, Lexington 1976; Hans Stob (ed.), *Die Stadt. Gestalt und Wandel bis zum industriellen Zeitalter*, Cologne 1970; Peter Schöller (ed.), *Zentralitätsforschung*, Darmstadt 1972; Karl Czok, *Die Stadt. Ihre Stellung in der deutschen Geschichte*, Leipzig 1969; Jürgen Reulecke (ed.), *Die deutsche Stadt im Industriezeitalter. Beiträge zur modernen deutschen Stadtgeschichte*, Wuppertal 1980.

The compilation works published during the last ten years contain excellent overviews on the research of urbanization and its future. Some examples: Derek Fraser and Anthony Sutcliffe (eds.), *The Pursuit of Urban History. Conference proceedings*, London 1983; Wilhelm Heinz Schröder (ed.), *Moderne Stadtgeschichte*, Stuttgart 1979.

Extensive overviews on the developments in Central European urbanization are provided for example in the following works: Hans Jürgen Teuteberg (ed.), *Urbanisierung im 19. und 20. Jahrhundert. Historische und geographische Aspekte*, Cologne 1983; Wilhelm Rausch (ed.), *Die Städte Mitteleuropas im 19. Jahrhundert*, Linz 1983; Wilhelm Rausch (ed.), *Die Städte Mitteleuropas im 20. Jahrhundert*, Linz 1984; Horst Matzerath, *Urbanisierung in Preußen 1815—1914. Schriften des Deutschen Instituts für Urbanistik* 72, Stuttgart 1985 and Jürgen Reulecke, *Geschichte der Urbanisierung in Deutschland*, Frankfurt am Main 1985.

6. Edith Ennen, *Stadt*, *Handwörterbuch der Sozialwissenschaften*, Bd. 9, Stuttgart-Tübingen-Göttingen 1956; Werner Sombart, *Der Begriff der Stadt und das Wesen der Städtebildung*, in: *Archiv für Sozialwissenschaft und Sozialpolitik*, Nr 25, 1907, pp. 1—9.
7. Philip M. Hauser, *Urbanization: An Overview*, in: Philip M. Hauser and L. E. Schnore (eds.), *The Study of Urbanization*, New York 1965, p. 1.

means of transportation were the sole necessary preconditions for a rapid urbanization process.⁸

The concept of urbanization was at its widest when it was considered to mean a new way of life and a change in the values said to influence the whole of society.⁹ This became evident in the emergence of a new type of commercial and industrial bourgeoisie, which was seeking power and wealth and was at the same time ready to take financial risks.¹⁰

Already in 1899 Adna Ferrin Weber acknowledged in her classic study *The Growth of Cities in the Nineteenth Century* the importance of urbanization by noting in the opening lines of her work that "The most remarkable social phenomenon of the present century is the concentration of population in cities".¹¹ Like Charles Booth, her contemporary, Weber observed and analyzed the social impact of urbanization stressing the loosening of human contacts. According to her, lurking behind the phenomenon of urbanization one can always find some ugly characteristics:

"It may be said, indeed, that it is our industrial system, and not city life, which engenders the essentially egoistic, self-seeking and materialistic attitude; but so long as the cities remain the results of the competitive industrial regime, they must share the blame. No one can view with equanimity the continual drift of population to the cities where it will be subject to such demoralizing influences."¹²

-
8. Hugo Preuss, *Stadt und Stadtverfassung. Entwicklungsgeschichtliches Überblick, Handwörterbuch der Kommunalwissenschaften*, Bd. IV, Jena 1924, p. 16.
 9. See for example: Brian J. L. Berry, *The Human Consequences of Urbanization. Divergent Paths in the Urban Experience of the Twentieth Century*, London 1973.
 10. Louis Wirth, *Urbanism as a Way of Life*, in: *American Journal of Sociology* 1938, July, pp. 1—24; Karl Bosl, *Die Mitteleuropäische Stadt des 19. Jahrhunderts im Wandel von Wirtschaft, Gesellschaft, Staat, Kultur*, in: Wilhelm Rausch (ed.), *Die Städte Mitteleuropas im 19. Jahrhundert*, Linz 1983, pp. 1—23.
 11. Adna Ferrin Weber, *The Growth of Cities in the Nineteenth Century. A Study in Statistics*, New York 1899 (1963), p. 1.
 12. *Ibid.* p. 433.

Adna Ferrin Weber emphasized that the cities were the 'oases of civilization', a viewpoint which was particularly strong at the turn of the century.¹³ But still in 1920's Oswald Spengler, perhaps one of the most eminent supporters of this opinion argued:

"Es ist eine ganz entscheidende und in ihrer vollen Bedeutung nie gewürdigte Tatsache, dass alle grossen Kulturen Stadtkulturen sind. Der höhere Mensch des zweiten Zeitalters ist ein städtebauendes Tier. Dies ist das eigentliche Kriterium der Weltgeschichte, das sie von der Menschengeschichte überhaupt aufs schärfste abhebt — Weltgeschichte ist die Geschichte des Stadtmenschen."¹⁴

The cities were seen as centres of human activity and efficiency. The more people, income and property accumulated in the cities the keener became the competition and the greater also the motivation for work.¹⁵

So far as British and German towns and cities were concerned the latter part of the 19th century can be called 'the first comprehensive urban age'.¹⁶ Indeed, scholars have for long wished to see this period as a separate phase in the process of urbanization.¹⁷ The urbanization process at the end

13. Ibid. p. 7.

14. Oswald Spengler, *Der Untergang des Abendlandes, Umriss einer Morphologie der Weltgeschichte*, Bd. 2, Munich 1924, p. 106.

15. Weber 1899, pp. 10—12.

16. P. J. Waller, *Town, City and Nation, England 1850—1914*, Oxford 1983, p. viii.

17. Eric E. Lampard, *Historical Aspects of Urbanization*, in: Philip M. Hauser and Leo F. Schnore (eds.), *The Study of Urbanization*, New York 1965, pp. 519—554; Hans Jürgen Teuteberg, *Historische Aspekte der Urbanisierung: Forschungsstand und Probleme*, in: Hans Jürgen Teuteberg (ed.), *Urbanisierung im 19. und 20. Jahrhundert. Historische und geographische Aspekte*, Cologne 1983, pp. 2—34; Heinz Heineberg, *Geographische Aspekte der Urbanisierung: Forschungsstand und Probleme*, in: Ibid., pp. 35—63.

According to Schäfers urbanization development in the Ancient World is the first stage in the history of urbanization. The second stage is the development of towns in the Middle Ages. The third stage is the development of towns during the period of Absolutism. Industrial urbanization is the fourth stage, which is followed by the fifth stage, the tertiary urban development.

Bernhard Schäfers, *Phasen der Stadtbildung und Verstädterung. Ein sozialgeschichtlicher und sozialstatistischer Überblick unter besonderer Be-*

of the 19th century and the beginning of the 20th century has, indeed, been the subject of much research. Even so scholars still emphasize the difficulty of discerning the various components of urban growth. *Verstädterung* (urbanization) was both the cause and the effect of incurring structural change. At the same time the urbanization process was influenced by industrialization and by the natural increase in population as well as by internal migration.¹⁸ But it is generally thought that the infrastructural services, tramways, gas, water and electricity works were the most important elements facilitating the urbanization process during the second half of the 19th century. Urban infrastructure investments were greatly expanded to include not only more elaborate and permanent habitations but also more complex networks of transport and communication. These services depended on the development of technology.

Technological development had a strong influence on the forms that urbanization took and the construction of railways accelerated the growth of cities. Railways were to be symbols of democracy. They gave the opportunity for immigration to the cities and they created the communication network that linked them. "It was through the railway that the inland communication centres in Germany generally consolidated their position, while the apparently more vulnerable court cities transformed themselves into major industrial centres"¹⁹. Later the automobile by contrast, scattered the cities pushing the population further and further away from the centres to the new suburbs, as Asa Briggs emphasizes.²⁰ At the same time it narrowed the gulf between urban and rural life.²¹

In the history of urbanization the development which began in the middle of the 19th century with the establishment of infrastructure can be also seen as a part of the process of

rücksichtigung Mitteleuropas, in: *Zeitschrift für Stadtgeschichte, Stadtsoziologie und Denkmalpflege* 4, 1977, pp. 257—266.

18. See for example Reulecke 1985, p. 68.

19. J. J. Lee, *Aspects of Urbanization and Economic Development in Germany 1815—1914*, in: Philip Abrams and E. A. Wrigley (eds.), *Towns and Societies, Essays in Economic History and Historical Sociology*, Cambridge 1978, pp. 281—282.

20. Asa Briggs, *Victorian Cities*, Harmondsworth 1975, p. 13.

21. Sam Bass Warner, Jr., *Streetcar Suburbs. The Process of Growth in Boston, 1870—1900*, Cambridge Mass. 1962.

modernization, because the successful provision of urban services was a prerequisite for the growth of large cities in the modern sense.²² The authorities in those cities were responsible for the solution of the major problems of urbanization, viz. housing, food supplies, sanitation and communications. Therefore it was considered necessary to collect relevant and useful information, not only from other cities in the same country but also from beyond the national boundaries.

The most recent research on urbanization in the 19th century emphasizes the interrelationship between industrialization, urbanization and modernization. Some scholars are inclined to think that industrialization was the cause of urbanization whereas some others consider them as parallel phenomena which do not necessarily have any correlation: after all the growth of cities and the agglomeration of population was great also in other types of municipalities that were not industrial towns. Indeed, scholars agree nowadays that it is difficult to find one representative type of city due to the extremely heterogenous nature of towns and cities at the beginning of this century.²³

Even so, urbanization went hand in hand with industrialization. In Great Britain, the first country to experience the industrial revolution, by 1841 some 17 per cent of the population were already living in London and other great cities with more than 100,000 inhabitants. This figure almost doubled in the next fifty years. In 1891 it had reached some 39.4 per cent and by 1911 43.8 per cent. However, the urban way of life was more widely based in Great Britain. By 1881 the aggregate urban population of England and Wales constituted 70 per cent of the whole and in 1911 almost 80 per cent were living in towns and cities with more than 2,500 inhabitants.²⁴ — In the case of Imperial Germany some 61.5 per cent of population in 1910 were living in urban areas with more than 2,000 inhabitants.²⁵

Indeed, in Germany the urbanization process started later, but at the turn of the century it was the swiftest in the world. The pace of urbanization accelerated dramatically in the 1850's

22. Matzerath 1985, pp. 20—21; Reulecke 1985, pp. 56—60.

23. Reulecke 1985, p. 9; Teuteberg 1983, pp. 28—31.

24. Waller 1983, pp. 2—9.

25. Statistisches Jahrbuch für das Deutsche Reich 1915, Berlin 1915, pp. 4—5.

when the urban population grew about two and half times as quickly as the rural population, reflecting the industrial spurt that had begun about the mid-century.²⁶ As a result, in 1900, there were as many great cities in imperial Germany as there had been in the whole of Europe a hundred years earlier. Two-thirds of the increase in the total urban population after 1870 was, however, concentrated in cities that were to have more than 100,000 inhabitants by 1914, 21.3 per cent of total German population. Whereas in 1871 in Germany there were only 8 cities with more than 100,000 inhabitants the number of those cities had increased by 1914 to 48. By the beginning of the First World War every fifth German lived in a large city.²⁷ The number of German cities in this category passed Britain's 39 in 1905 at a time when Russia had only 19, France 15, Italy 11, Sweden 3 and Finland 1 such town.²⁸

Scholars exploring political and economic relations between Great Britain and Germany at this time have emphasized the coolness in these relations which resulted from the arms race as well as from economic and colonial rivalries.²⁹ More recently, however, for example Gerald Deckart, in his doctoral dissertation *Deutsch-Englische Verständigung*, and Günter Hollenberg, in *Englisches Interesse am Kaiserreich*, have explored the co-operation that existed between the British and the Germans in the period after the entente policy had been abandoned. They both discuss also co-operation between British and German cities on the part of different groups below governmental level.³⁰ Burgomasters were one of such groups

26. Wolfgang Köllmann, The Process of Urbanization in Germany at the Height of the Industrialization Period, in: *Journal of Contemporary History* 1969, pp. 56—76.

27. *Statistisches Jahrbuch für das Deutsche Reich* 1915, Berlin 1915, pp. 4—5.

28. Lee 1978, pp. 279—293.

29. See for example R. J. S. Hoffman, Great Britain and the German Trade Rivalry 1875—1914, Philadelphia 1933; Percy Ernst Schramm, Deutschland in englischer Auffassung am Vorabend des Weltkrieges, in: *Typos für Wilhelm Ahlmann*, Berlin 1951, pp. 135—175.

30. Gerald Deckart, *Deutsch-Englische Verständigung. Eine Darstellung der nichtoffiziellen Bemühungen um eine Wiederannäherung der beiden Länder zwischen 1905 und 1914*. Diss. phil. Munich 1967; Günter Hollenberg, *Englisches Interesse am Kaiserreich. Die Attraktivität Preußen — Deutschlands für konservative und liberale Kreise in Grossbritannien 1860—1914*, Wiesbaden 1974.

interested in co-operation. The turn of the century for example, saw the establishment of a specialist society, The British Committee for the Study of Foreign Municipal Institutions.³¹ The joint arrangement of meetings of City Associations were to follow as well as the publication of a number of volumes of municipal statistics and municipal journals. Co-operation between cities began in Great Britain in 1870's. In Germany meetings of Associations of Cities and Towns (Städtetage) were already taking place at regional level in the 1860's (e.g. Schlesische Städtetage 1863, Sächsische Städtetage 1864, Hannoverische Städteverein 1866). The first national meeting, however, was not held until 1905.³² Similar meetings were first organized in Denmark in 1873, in Norway in 1903, in Sweden in 1909 and in Finland in 1912.³³

Urbanization was a very international phenomenon. Even in those countries where the rate of urbanization was relatively low when compared for example with the developments in the continental Europe, people adopted the metropolitan ways of behaviour and sentiments of either admiration or apprehension in the face of urbanization were commonly expressed. For example in Sweden and in Finland, which at that time was an autonomous Grand Duchy in the Russian Empire, people were interested in following European developments.³⁴

Several scholars, including Lewis Mumford, have undertaken the comparative research of urban history.³⁵ Too often, however, their basic assumption has been that cities were all alike. Although economic, social and demographic differences have been investigated, not enough attention is paid —

31. John Gorst, Introduction, in: Henry S. Lunn, *Municipal Lessons from Southern Germany*, London 1908, pp. 1—10.

32. Association of Municipal Corporations' Minutes, 30/72, Public Record Office; Otto Ziebill, *Geschichte des deutschen Städtetages, Fünfzig Jahre deutscher Kommunalpolitik*, Stuttgart 1955, pp. 9—16.

33. Yrjö Harvia, *Suomen Kaupunkiliitto 1912—1937, Kunnallisen Keskustoimiston julkaisuja XIV*, Helsinki 1938, pp. 19—20.

34. Marjatta Hietala, *The Diffusion of Innovations. Some Examples of Finnish Civil Servants' Professional Tours in Europe*, in: *Scandinavian Journal of History* 1983, pp. 23—36.

35. Lewis Mumford, *The Culture of Cities*, London, printed in USA 1938; Lewis Mumford, *The City in History; Its Origins, its Transformations and its Prospects*, Harmondsworth 1975.

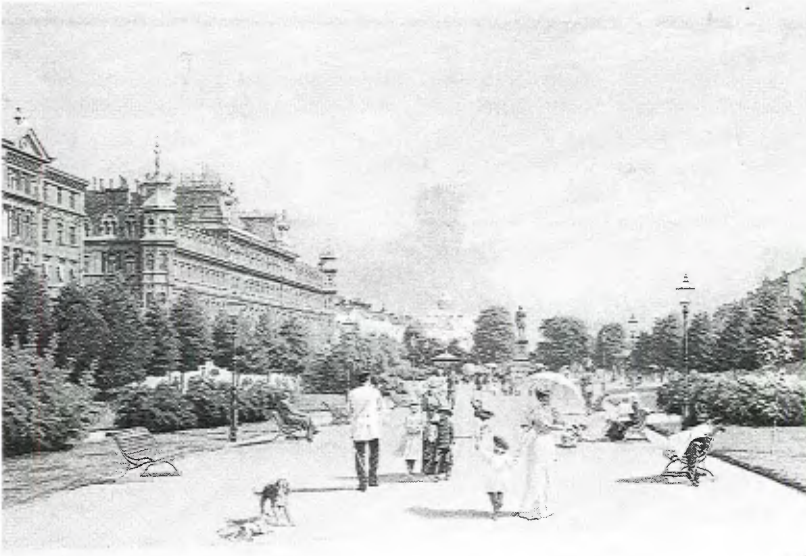


Figure 1.

By European standards Helsinki remained a small town until the 1880's, when the city started to grow. By the turn of the century population was already 100,000. Also the outward symbols of metropolitan life, the wide boulevards and the Neo-Renaissance style buildings are indications of the aim to develop Helsinki into a continental-style city.

The illustration shows the Esplanade, a boulevard type street. On the right is the Grönqvist house (by Architect Th. Höijer), which was completed in 1882—1883 and was at the time the largest building for housing in the Nordic countries. (Collections of the Helsinki City Museum)

according to Asa Briggs — to the fact that "each city responded differently to the urban problems which they shared in common. A study of English Victorian cities, in particular, must necessarily be concerned with individual cases".³⁶ This notion is supported by P. J. Waller in the preface to his study *Town, City and Nation England 1850—1914* where he states:

36. Briggs 1975, pp. 33—34.

"It is an essential part of the urban historian's task to demonstrate that urban functions and dysfunctions, the urban experience and the urban influence, were very variable. Though towns and cities shared many characteristics they were not equal or alike."³⁷

The aim of this study is to analyze by comparison the relationship between urbanization and services looked at in particular in relation to the diffusion of innovations. The aims are presented in more detail in chapter 4.

The main emphasis of the study is neither at the macro level, ie. the general development of cities or their service supply nor at the micro level, i.e. the analysis of individual cities or services. Instead it is at the intermediate level so that the analysis is carried out for example by searching and comparing suitable groups of cities, cities in different stages of development as well as groups of services.

37. Waller 1983, p. viii.

2. Urbanization, Services and the Diffusion of Innovations — Some Theoretical Issues

Urbanization has most often been closely linked with industrialization and the development of technology even if there has been some controversy about the nature of the connection between urbanization and industrialization. However, trading and administrative towns also expanded, not because of industry but mainly because of the potential demand for various services. In the Nordic countries on the other hand developing industry frequently found its most suitable locations in small centres of population along water ways and so far as the criteria of urbanization can be applied to these centres could meet them only insofar as they had developed an urban way of life.

In the following study the urbanization process is divided into three different stages, which can be called *the take-off stage*, *the stage of accelerating growth* and *the stage of slackening growth*.

Among scholars who have earlier presented theories on the various stages of urbanization are Wilbur Thompson, Allan Pred and Alfred Watkins, who have deliberated upon the criteria which could be used for discriminating various stages of urban growth. When studying urbanization in the United States Pred was able to distinguish the mercantile period and the dynamic growth of industrial cities which began after 1860 and was based on the division of labour and specialization. The location of raw materials became less important than before

because of the improving transport connections.¹

According to Wilbur Thompson it is possible to distinguish in the development of cities a first stage of specialization in an export trade often dominated by a single branch of industry followed by a second stage of more complex export trade during which local production expanded to embrace a number of further products. The third stage was the period of economic maturation when many services developed to be followed fourthly, by the period of territorial growth when the city consolidated its leading position in the region and was the main supplier of services. The fifth and final stage was the period of technological professionalism.²

According to Alfred Watkins cities have their own course of life, during which they grow, mature and decline. In order to distinguish these phases he calculated the percentage growth of cities and compared these figures with the average national rate of growth. In the case of each city he discerned its own growth period on the basis of the times when the city overtook or fell short of the average national rate of urbanization. Watkins emphasized the flexibility of the process, with the characteristics of the former period sometimes lasting into the next one for a considerable period. He was also very critical of classifications based on the concept of population thresholds.³

The idea of population thresholds has been the subject of much scholarly discussion recently, and, indeed, this approach is an important one so far as services are concerned in explaining the origin of various private services. On the other hand in the case of public services a more important criterion than the population threshold has proved to be the interpretation of the city's common interests by the local authorities. Only after this have municipal or state regulations had either a suggestive or mandatory impact on the provision of services.

1. Allan R. Pred, *The Spatial Dynamics of U.S. Urban Industrial Growth 1800—1914*, Cambridge Mass. 1966; Wilbur R. Thompson, *A Preface to Urban Economics*, Baltimore 1968; Alfred J. Watkins, *The Practice of Urban Economics*. Sage Library of Social Research; Vol. 107, London 1980, pp. 151—190.

2. Thompson 1968, *passim*.

3. Watkins 1980, pp. 151—190.

When exploring the different stages of urbanization the whole problem can be reduced to the question of what role the cities played in relation to other, wider developments in the country. According to Eric E. Lampard the urbanization process should be studied as a part of social history.⁴ Asa Briggs on the other hand emphasizes that cities are independent units which may have diversified needs and a number of varied development characteristics during the different stages of growth.⁵

Since Max Weber many sociologists have been interested in exploring the psychological background of fast economic growth. Weber himself found the roots of the modern capitalist spirit in the Protestant ethic of hard work whereas, for example, Parsons and his school of thought, when describing important characteristics of the social structure in modern industrialized societies, emphasized features which differentiate them from traditional ones. The most essential of these was the emphasis on achievement prevailing in modern societies.⁶

In the following theoretical study I assume, like Asa Briggs, that in the development of urbanization and services the cities also had their own active role to play.

An innovation is the general acceptance and implementation of new ideas, processes, products or services. Innovation therefore implies the capacity to change and adapt. Innovation processes include the following stages: invention, development, commercialization and diffusion. In this study only the diffusion aspect of innovation processes has been investigated.

According to the traditional opinions, expressed for example by T. Hägerstrand, innovations proceed in stages from larger cities to smaller ones and from developed countries to less

4. Eric E. Lampard, *The History of Cities in the Economically Advanced Areas*, in: *Economic Development and Cultural Change*, Vol. 3, 1955, pp. 81—136.

5. Briggs 1975, see Introduction, pp. 11—58.

6. Gerhard W. Ditz, *The Protestant Ethic and the Market Economy*, *Kyklos*, Vol. 33, Fa. 4, 1980, pp. 623—657; Gordon Marshall, *In Search of Capitalism. An Essay on Max Weber's Protestant Ethic Thesis*, London 1982, pp. 41—82.

developed ones.⁷ At the level of individual citizens the pioneers are first to adopt innovations and they are followed by others. The best-known representative of this school of thought is Everett Rogers.⁸

Innovations are first applied in one or several locations, such as cities, and information of this is spread through various channels. If the idea seems interesting and if the innovation itself is considered to be applicable more information will be acquired about it. The origin of interest, however, depends on motives and aims: how eagerly, for example were the cities to be developed and enlarged? For these questions, indeed, are the areas where the application of innovations offers both means and possibilities.

How information is received depends both on the channels of communication and on their effectivity. It also depends on reference groups, because comparisons are made with a reference group: its solutions are noticed and often also imitated. The channels of diffusion of innovations are classified as follows:

- employing foreign experts
- study abroad, personal contacts
- research papers, literature and journals, statistics
- international congresses and exhibitions.

In this research I do not study innovations themselves or their origins but rather *the question of the diffusion of innovations*. This study aims to explore what were the motives and reference groups in the background of the diffusion of innovations as well as how innovations in the groups of services that are the subject of this study were disseminated at various stages in the growth of cities. The results achieved are summarised in chapter 14. where conclusions are also drawn on the extent and how the above mentioned traditional opinion on the diffusion of innovations is actually found to be valid or not.

The stages of the growth of cities are explored from the point of view of the development of services and the spreading of innovations. The above mentioned more general theories of

7. T. Hägerstrand, Aspects of Spatial Structure of Social Communication and the Diffusion of Information. Regional Science Association Papers, Philadelphia 1966, pp. 27—42.

8. Everett M. Rogers, Diffusion of Innovations, 2. rev.ed., New York 1983.

urbanization are applied from a particular viewpoint to a certain historical situation as a result of which it is possible to formulate hypotheses and research problems and to select variables used in this study.

The take-off stage

The take-off of the growth of cities was often a consequence of the beginning of their industrial growth. Technological development had opened up possibilities which were first grasped by the most innovative pioneering entrepreneurs. Production required support from the infrastructure and other services and with the help of services it was also possible to increase industrial growth. An interesting question is who were responsible for the initiation of the development of services, private individuals or municipalities. A similarly interesting problem is whether services originally were the results of industrialization or whether on the contrary the first to be developed were services on basis of which industry consequently was able to grow? And how were the basic services secured in industrial cities? Were the industrial cities also able to serve their inhabitants?

The development of services involve the following prerequisites:

1. Decision-makers recognize the importance of services
2. Decision-makers are motivated to develop services
3. There are adequate economic resources for the development of services.

Both in the appreciation (1) and motivation (2) in particular the diffusion of innovations has a decisively important role to play.

According to the theories of innovation all decision-makers do not recognize new opportunities at the same time and some people become aware of the significance of services and infrastructure before others. These innovators then endeavour to convince other interested people within their own cities. The whole process is facilitated by the free flow of information through adequate channels. Other cities will then follow suit after recognizing the success of growth policies. Thus

entrepreneurs/cities can form reference groups for each other both at the national as well as at the international level. This pattern does not exclude competition. On the contrary, the model or advantage of one city can act as a considerable incentive to the others.⁷ Often services and infrastructure are the means by which the city leadership can reach its growth targets. Consequently the infrastructure and other services are accorded greater importance according to their capacity to produce growth and promote production.

The second condition is that the decision-makers have enough motivation for the development of their cities. The increasing amount of information and the experiences gained by other cities add also to the pressure on them for developing the provision of services in the city.

Economic resources are the third condition of growth. Cities acquire their income from various sources: taxes, rates, fees, loans and subsidies. If there is a recognition of growth prospects as well as motivation for growth the resources are sought, for example, by raising loans. It is even possible to present a hypothesis that the more heavily the city is burdened with loans in the take-off stage the more it has recognized its growth potential and also the more motivated it is.

The stage of accelerating growth

The stage of accelerating growth is reached when the growth process has become self-perpetuating. Infrastructural and other service investments encourage industrial investments creating consequently new income and attracting people to move into the municipality. This again creates a demand for services, housing and various forms of infrastructure. Increased tax receipts again enable the supply of services to be increased. Improved infrastructure creates further operational prerequisites for industry which again creates new revenue after the profits have been reinvested.

Economic growth creates income, with great repercussions, for example, on the increase of demand of goods and services. The municipalities also become more active in launching new

municipal enterprises — not least because of the prospect of lucrative profits.

During the stage of accelerating growth the supply of services in the municipality/city becomes more varied due to the following interlinked reasons:

- after establishing the services to meet the productive and basic physical needs there is now more scope to satisfy the higher needs, i.e. to satisfy the higher needs of the hierarchy of needs;
- as a result of growth also resources have increased;
- municipalities/cities have to a certain extent to compete for the qualified workforce and they can do this by offering housing and services, whereas private enterprises compete by offering higher wages.

During this stage experiences of applications of innovations had been accumulating and consequently developments were being followed in a more systematic manner. This had an influence on which information channels were selected.

It is possible, therefore, to summarize by saying that services are no longer merely a way of reaching growth targets but increasingly begin to acquire the characteristics of objectives in themselves. The welfare of the population can be increased with the aid of services and this becomes of greater and greater concern to the decision-makers. Services are, however, developed also for other reasons, such as political purposes or for maintaining social stability. Thus various acts of social policy, the provision of housing services and the distribution of municipal allotments among others are frequently introduced in order to keep the working population content.

The stage of slackening growth

The ending of the stage of accelerating growth can be observed from the technological point of view. In the periods of take-off and accelerating growth the issue is how to adopt the existing technology and when this process of adaptation and learning has advanced as far as possible in the existing circumstances it means in fact also the ending of the period of accelerating

growth. When infrastructure and other services necessary to industry have been established and the industrial output has grown sufficiently to meet the potential demand both at home and in export markets, the limits of accelerating growth are finally reached — in spite of the fact that both during the take-off stage and the stage of accelerating growth there has been an abundant, hidden and unsatisfied demand for the new, cheap and massproduced items.

During this stage the speed of growth in industry is slowing down for the reasons mentioned above. The growth rate of services, however, remains just as significant as before. Using the number of jobs as a measure, the emphasis on growth can be seen to be transferred from industry to services. The following reasons can be found for this development:

- the increase in incomes creates a demand for private services and assisted by consequent increase of tax revenue, it also improves the provision of public services;
- the unionization of employees also influenced the establishment of some services;
- alongside the increase of resources in producing services the technology for providing them is improving;
- the impact of political and humanitarian ideas on the improvement of employees' living conditions;
- the belief in the production of services as economically and socially profitable activities, given that they could help to eliminate the causes of social disturbances. In other words services are considered to increase productivity and/or to decrease social expenditure.

During the stage of slackening growth even more experience had accumulated both of domestic and foreign applications of innovations for various purposes and they offered a wealth of points for comparison. Consequently the attitude towards new ideas became critical and their merits began to be pondered by way of a detailed analysis of their qualities. In many cities developments had made such progress that the city itself could now also be the party supplying the innovative models.⁹

9. Marjatta Hietala, Beziehungen zwischen Urbanisierung und Dienstleistungen an Beispielen Deutscher Gross-Städte 1890 bis 1910, in: Heinz Heineberg (ed.) Innerstädtische Differenzierung und Prozesse im 19. und 20. Jahrhundert. Geographische und historische Aspekte, Cologne 1987, pp. 331—349.

3. Aspects of Research on the Services

In general existing demand and adequate population are considered to be the basic requirements for the birth and development of services. Services are established in areas with existing needs — first of all in cities and built-up areas — with the exception of some services in the public sector which are established nationally, such as the administration or the maintenance of law and order. Remarkably large populations and geographical areas of influence are considered as normal requirements for the establishment of most services.

The nature of services as viewed by various disciplines

Nowadays the purpose of services is considered to include the improvement or maintenance of the quality of life of the individual human being and of his circumstances. At the same time services as a totality can be seen also from the point of view of the region's welfare. They are considered to have, as an essential function, the attraction of population and industry including manufacturing industry. Moreover the existing hierarchical classifications of centres are based mainly on the types of services, which can be found in those centres.

It was geographers who were first interested in the incidence of various types of services in centres of different sizes. In their studies services were seen to perform central functions which determine the attraction, pull-factor, of each centre as well as its geographic area of influence. On this basis centres can be

allocated to different categories. The theories of the hierarchy of centres, developed by Walter Christaller, August Lösch and Walter Isard, are based on the notion of a hierarchy of human needs. According to these theories the lowest centres offer in the main the most frequently used services whereas services demanded more rarely occur usually in centres with a higher position in the hierarchy.¹ A retail shop selling consumer goods in daily use illustrates the former type of services, an opera house is a good example of the latter. From history, however, we can pick up a number of examples which provide exceptions to these theories. So for instance one can discern, along rivers and sea shores, along traffic and communication routes, the emergence of commercial centres where many other service sectors were far less developed than the actual trade of the centre itself. Some other towns again transformed themselves into centres of school and university education where other activities mainly supported the educational ones in the form of publishing companies and bookshops. In some industrial cities on the other hand the provision of public services lagged well behind the other developments even though these centres could meet the precondition of adequate population. These theories of the hierarchy of centres were based on the scrutiny of the volume of services available, their division into various categories as well as their distribution in the geographical area.²

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1. Walter Christaller, *Die zentralen Orte in Süddeutschland. Eine ökonomisch-geographische Untersuchung über die Gesetzmässigkeit der Verbreitung und Entwicklung der Siedlungen mit Städtischen Funktionen*. Diss. Erlangen; Jena 1933, (Darmstadt 1968), August Lösch, *Die räumliche Ordnung der Wirtschaft*, Jena 1940 (Stuttgart 1962); Walter Isard, *Location and Space Economy. A general theory relating the industrial location, market areas, land use, trade and urban structure*, Cambridge Mass. 1956.
 2. See Hans Heinrich Blotevogel, *Kulturelle Stadtfunktionen und Urbanisierung: Interdependente Beziehungen im Rahmen der Entwicklung des deutschen Städtesystems im Industriezeitalter*, in: Hans Jürgen Teuteberg (ed.), *Urbanisierung im 19. und 20. Jahrhundert. Historische und geographische Aspekte*, Cologne 1983, pp. 143—186; Frans Irsigler, *Stadt und Umland in der historischen Forschung: Theorien und Konzepte*, in: Neithard Bulst, Jochen Hook, Franz Irsigler (eds.), *Bevölkerung, Wirtschaft und Gesellschaft Stadt-Land-Beziehungen in Deutschland und Frankreich 14. bis 19. Jahrhundert*, Trier 1983, pp. 13—38.

Decision-makers and planners have also been interested in the maintenance costs of services provided by local units and the cost benefits of these services as well as the studying of services as a branch of industry. The proportion of the population working in the service sector has increased considerably when compared with others because so far it has not been possible to increase the productivity per employee in that sector at a rate which equals productivity rises in agriculture and manufacturing industry.

It is generally accepted that the volume of services will grow in accordance with general economic growth, because of their great income elasticity: the greater the income the greater the demand for services. Consequently, because the productivity of services has been low, the proportion of the population working in services has increased and has done so when compared with other branches of industry.

Economists on the other hand have been exploring the demand and supply of services and their connection with economic growth. Service enterprises have been investigated by using the approach of business economics exactly in the same manner as any other form of business. Attention has been paid to marketing, profitability and other factors affecting the prosperity of a firm.³

Also architects and art historians have been interested in the establishment of services and their position in the built environment, especially as attention has been increasingly focussed recently on the overall formation of the built environment.⁴

One of the most modern concerns of urban history is the study of history of planning and as a result a wealth of scholarly literature on this subject has been published in the

3. Patrick K. O'Brien, *The Analysis and Measurement of the Service Economy in European Economic History*, in: Rainer Fremdling and Patrick K. O'Brien (eds.), *Productivity in the Economies of Europe*, *Historisch-Sozialwissenschaftliche Forschungen*, Bd. 15, Stuttgart 1983.

4. Ingrid Hammarström and Thomas Hall (eds.), *Growth and Transformation of the Modern City. The Stockholm Conference, September 1978*. University of Stockholm, Stockholm 1979.

last few years. Its approach is well-suited indeed to the general field of historical research.⁵

Sociologists and researchers of social policy, on the other hand, have been mostly interested in the use of services, their availability and their role within the social environment.⁶

However, it has largely been discussions on the quality of life and on how to measure the standard of living or the level of regional development that have brought the level of services in general into the scope of scientific research. This is a consequence of the needs of various activities; the management and maintenance of housing, labour market organization, the maintenance of health, education and leisure time activities which have all demanded an ever expanding network of services.

The study of services — even the whole concept of services (*Dienstleistungen*) is very recent. Only after A.G.B. Fisher in the 1930's had expanded in the *Labour Review*⁷ his concept of the threefold major groupings of industry, did the service sector come to be recognized as an independent sector equivalent to the agricultural and industrial sectors. Fisher's view of the growth and development of this tertiary sector after a country's industrialization phase prompted researchers to study the increase of the proportion of the population employed in the service sector in the cities and in the industrial countries and they began to speak about the birth of a services society. This concept has some similarities to the term 'post industrial society' discussed extensively by Rostow,⁸ whose theories have been criticized and further developed by the French scholar, Jean Fourastié⁹.

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5. See Anthony Sutcliffe, *Towards the Planned City*, Germany, Britain, the United States and France 1780—1914. Comparative Studies in Social and Economic History 3, Oxford 1981.
 6. For ex. Bernd Hamm, *Einführung in die Siedlungssoziologie*, Munich 1982; Louis Wirth, *Urbanism as a Way of Life*, in: *American Journal of Sociology*, July 1938.
 7. Allan G. B. Fisher, *The economic implications of Material Progress*, in: *International Labour Review*, Vol XXXII, 1935 Geneva, p. 5—18; Allan G. B. Fisher, *Economic Progress and Social Security*, London 1946, p. 57.
 8. W. W. Rostow, *The Stages of Economic Growth*, Cambridge 1966.
 9. Fourastié has developed the idea of the growth of the tertiary sector and predicted that in the future postindustrial society 10 % of the workforce will be working in industry, 10 % in agriculture and 80 % in services. Jean Fourastié, *La grande Métamorphose du XX^e siècle. Essais sur quelques Problèmes, de l'Humanité d'Aujourd'hui*, 2.éd, Paris 1962.

Theories based on needs have often been used as a starting point in research dealing with the quality of life and human well being. The most famous of these are the theories of needs outlined by Maslow and Alderfer. Maslow distinguishes five kinds of needs: those connected with, respectively, physiology, security, companionship and love, respect and self-realization, and he assumes that all these needs are hierarchical.¹⁰ Alderfer strongly opposes the idea of such a hierarchy drawing attention to the possibility that if the satisfaction of any higher need is for the moment suppressed, the effect may be the strengthening of certain lower needs. Alderfer subsumes physiological and security needs under one heading 'the maintenance of the self'. The need for companionship and love, along with part of the need for esteem, he subsumes under the 'need for relatedness' and the needs for self-realization and self-esteem under the 'need for growth'.¹¹

The official classification of the United Nations deems the following welfare factors to be relevant to the standard of living: 1) health, 2) consumption of food, 3) education, 4) employment and working conditions, 5) housing, 6) recreation and leisure time activities, 7) social security and 8) clothing. In Swedish research on the standard of living, human functions are divided into the following areas: 1) health, 2) food habits, 3) education, 4) employment and working conditions, 5) housing, 6) leisure time activities and recreation, 7) the child's environment and family relationships, 8) economic resources and 9) political opportunities. Both of these systems of classification are derived from individual needs and they raise questions about the origins of different types of services as well as about the need and demand for them.¹²

At the same time there are several types of services which have been and are organized mainly because they have been considered necessary and beneficial for the whole of society.

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10. Abraham Maslow, *Motivation and Personality*, 2nd edition, New York 1970, pp. 38, 51—53.
 11. Clayton P. Alderfer, *Existence, Relatedness and Growth*, New York 1972, pp. 6—21; In Finland these classifications were developed further by Erik Allardt, Erik Allardt, *Hyvinvoinnin ulottuvuuksia*, Porvoo 1976.
 12. United Nations, *International Definition and Measurement of Level of Living. An Interim Guide*, New York 1961; Sten Johansson, *Om levnadsundersökningen*, Stockholm 1970.

Public services are of this kind and society itself has accepted responsibility for their production. Normally these are infrastructural services, which are typically connected with the greater incidence of urban areas and growing anxiety over the living conditions of the population, as well as over the standard of their health and education. However, the public sector has not always been the initiator of such services. Many services have been established by private initiatives. Voluntary organizations were often pioneers of providing services. The growth of cities, however, made (or even forced) many private individuals to become interested first in fire protection and the improvement of public sanitation as well as in the provision of fresh water, while in the second half of the 19th century attention was paid to the development of a whole variety of infrastructural services, such as production of energy and lighting as well as urban transport. Recent research has shown how the building of the infrastructure in the 19th century was important for the whole of social development.

Services as a part of infrastructure

The widest definition of the area of infrastructure is given by R. Jochimsen in his study *Theorien der Infrastruktur. Grundlagen der Marktwissenschaftlichen Entwicklung*¹³ and he includes in that definition the following elements:

- 1) all the works and equipments necessary for energy distribution, traffic control and telecommunication
- 2) preservation of natural resources
- 3) administration, education, training and research as well as social and health care services.

According to Jochimsen the only dispute is over whether or not the building of dwelling houses is included in the infrastructure.

Jochimsen discusses also the concepts of institutional, material and personal infrastructures (Infrastruktur als Summe der materiellen, institutionellen und personalen Einrichtungen

13. Reimut Jochimsen, *Theorien der Infrastruktur. Grundlagen der Marktwirtschaftlichen Entwicklung*, Tübingen 1966, pp. 103—146.

und Gegebenheiten).¹⁴ By material infrastructure he means social overhead capital, that is functions which improve the capacity to develop the national economy. The institutional infrastructure deals with socio-juridical order: the totality of all institutions, judicial norms, traditions and customs. The personal infrastructure consists of 'human capital', which can express itself in the standard of education of the work force, its willingness to perform its tasks, its health and its technical knowledge.

Among other researchers Stohler presents as the technical characteristics of the infrastructure its undivided nature, its long life, the interdependence of its components as well as its heterogeneity. Among its economic characteristics he includes for example its cost relating effects, the external influences and the non-continuation of costs.¹⁵

Frey on the other hand breaks down the infrastructure into a number of aspects: the material capital (e.g. land and buildings) and the immaterial capital (e.g. the level of education and health of the population, research potentiality etc.) as well as into the institutional infrastructure.¹⁶

In his article *Infrastrukturinvestitionen als Mittel der Strukturpolitik*¹⁷ Egon Tuchtfield defines the infrastructure as follows:

"Infrastructural investments consist mainly of all investments carried out by public authorities, which form the preconditions for the developing capacity of the national economy."

In addition this means that:

- infrastructural investments are necessary expenses,
- infrastructural investments are used for the public benefit,

14. Reimut Jochimsen and Knut Gustafsson, *Infrastruktur*, in: *Handwörterbuch der Raumforschung und Raumordnung*, 2. Aufl., Bd. 2, Hanover 1966, pp. 1318—1335.

15. Jacques Stohler, *Zur rationalen Planung der Infrastruktur*, in: *Konjunkturpolitik*, Jg. 11, 1965, pp. 279—308.

16. R. L. Frey, *Probleme der statistischen Erfassung der Infrastruktur*, in: *Schweizerische Zeitschrift für Volkswirtschaft und Statistik*, Bd. 103, 1967.

17. Egon Tuchtfield, *Infrastrukturinvestitionen als Mittel der Strukturpolitik*, in: Reimut Jochimsen and Udo E. Simonis (eds.), *Theorie und Praxis der Infrastrukturpolitik*, Schriften des Vereins für Sozialpolitik, N.F. Bd. 54, Berlin 1970, p. 125—151, wiedergedruckt in: Udo E. Simonis (ed.) *Infrastruktur*, Cologne 1977, p. 145—157.

- the costs of which are collected by taxation and rates,
- infrastructural investments are indivisible.

According to Walter Buhr infrastructural services can be produced both by public and by private initiative. Infrastructural institutions he classifies as enterprise oriented and household oriented. He uses the material infrastructure as a conceptual basis for his study and within that examines the following aspects:¹⁸

- institutions concerned with communications (streets, airports, telecommunications),
- education and research institutions (schools, universities, research institutes),
- health care institutions (health insurance, hospitals, old people's homes, recreational opportunities or leisure time services),
- services concerned with energy production (heating, electricity, gas) as well as the water supply,
- drainage and sewerage, disposal of refuse, services concerned with maintaining fresh air.

On the other hand when discussing the connections between economic growth and infrastructure Buhr indicates that the scope of local growth may not be dependent on the nature of the local infrastructure. Indeed, when speaking of growth effects he actually means determinants of the infrastructure.

Whereas earlier researchers had concentrated on studying only one service sector, transport being one of the most popular, Buhr claims that only when the elements of infrastructure are considered as being interdependent is it possible to speak about infrastructure at all.

The division of the material infrastructure can be examined horizontally and hierarchically. Horizontally the service outlets in different networks can be observed in relation to each other (e.g. network of airports and network of hospitals). Hierarchically the development of services can be observed within a particular geographical area: e.g. in the state, the province, the commune.

18. Walter Buhr, *Die Rolle der materiellen Infrastruktur im regionalen Wirtschaftswachstum. Studien über die Infrastruktur eines städtischen Gebietes: Der Fall Santa Clara County/California. Volkswirtschaftliche Schriften*, J. Broerman (ed.), Heft 240, Berlin 1975, pp. 11—22.

When studying the effects of infrastructure, one of the most interesting aspects is the attraction effect. This is evident in all plans for the location of services. On the other hand there has also been discussion about the self-perpetuating effect of infrastructure when the infrastructure itself creates growth effects: because of the high standard of services the level of income rises, the purchasing power increases etc.¹⁹

When social overhead capital is discussed in the Anglo-American literature there seems to be a certain tendency to limit the scope of infrastructure. Thus Hirschman presents four different criteria typical of the infrastructure, which he calls social overhead capital.²⁰

- 1) infrastructure makes possible the productive activities of the other areas,
- 2) infrastructure is developed in the public sector or under public control,
- 3) infrastructure cannot be exported and it is tied to a certain locality,
- 4) technical indivisibility and high capital formation are characteristic of infrastructural investments.

In the narrow sense this includes only transport and energy management but in the wider sense it also includes administration, the judicial and educational system, health care, communications other than transport as well as the water supply and sewerage. Rosenstein-Rodan and Cootner add to these criteria a condition of long term infrastructural investments.²¹

On the basis of these definitions by Jochimsen and Hirschman Paul Günther Jansen uses the twin concepts: superstructure and infrastructure in his study.²²

19. Buhr 1975, pp. 30—32.

20. A. O. Hirschman, *The Strategy of Economic Development*, New Haven and London, 9. ed. 1965, p. 83.

21. P. H. Cootner, *Social Overhead Capital and Economic Growth*, in W. W. Rostow (ed.), *The Economics of Take-off into Sustained Growth*, London 1963, p. 262; P. Rosenstein-Rodan, *Notes on Theory of the Big Push*, unpublished Memorandum for the Center for International Studies, Cambridge 1957.

22. Paul Günther Jansen, *Infrastrukturinvestitionen als Mittel der Regionalpolitik*. Beiträge zur Raumplanung, ed. Zentralinstitut für Raumplanung an der Universität Münster, Bd. 3, Gütersloh 1967.

The term superstructure was coined by J. Tinbergen and it means those elements of the capital goods of the national economy, which are not included in the infrastructure. The most important of these is industry.²³

Aspects on services at the turn of the century

The classification of various components necessary for ensuring the quality of life, which was discussed earlier in this study, is a product of our own age. Nevertheless, some responsibility for the environmental welfare of the community was felt by those who for example established fire brigades or carried out slum clearances. Along with the public health reformers, who often were Medical Officers of Health, health-related tasks were adopted by numerous voluntary organizations and employees of the Churches.²⁴ In the 19th century and the early years of this century opinions on the need to develop services and institutions varied greatly from town to town and from one group to another, and indeed the idea of providing all population groups with equal services has by no means been universal.

Because of the growth of the new industrial city the decision-makers had to take a closer look at the emerging problems. The earlier policy was confined to dealing with acute problems and caring for the overall appearance of the town. Already before the Municipal Reform Act of 1835 some English city corporations like the Corporation of Liverpool were anxious to take responsibility for the city environment even if it inevitably interfered with the free exercise of property rights.²⁵

23. Jan Tinbergen, *Shaping the World Economy. Suggestions for an International Economic Policy*, New York 1962, p. 133.

24. E. P. Hennock, *Fit and Proper Persons. Ideal and reality in nineteenth-century urban government*. *Studies in Urban History* 2, London 1973, pp. 1—3; E. P. Hennock, *Finance and Politics in Urban Local Government in England*, in: *Historical Journal*, Vol VI, 1963.

25. Derek Fraser, *Power and Authority in the Victorian City*, *Comparative Studies in Social and Economic History* 1, Oxford 1979, p. 37.

According to Derek Fraser Public Health Reform in Liverpool rested on the triple pillars of the cleansing and drainage of the streets, sewerage and the water supply. The chairman of the Liverpool Health Committee, John Tinne laid down in 1849 a bold programme of objectives:

"The substitution of water closets for privies, the abolition of cesspools, the banishment of all noxious manufactures from the vicinity of inhabited places, the removal of slaughterhouses without the borough, the total prevention of intra-mural interments; these with an abundant supply of water, the due apportionment of population to area, the widening of streets, the establishing of well-regulated Abbatoirs beyond the precincts of the borough."²⁶

It was necessary first to develop ways of meeting primary needs, i.e. housing, food, sanitation and health. It is evident from the reports on the circumstances of the working class in the English industrial cities in particular how problems accumulated and that major interest centred on health care and the miserable housing conditions.²⁷ Several strategies were developed for the production of healthier, cheaper and more comfortable dwellings, as for example the ambitious plans of Victor Aimé Huber, professor of the history of literature in Berlin, and the projects completed in the 1850's as a result of which hundreds of people were provided with healthier dwellings in the suburbs of Berlin. Behind this pattern of thought, however, probably lurked an attempt to adjust working class people to the bourgeois way of life.²⁸

Further evidence of the close links of housing problems with urbanization can be found for example in Helsinki, where already in the 1870's there were discussions on whether the Mulhouse model of workers' housing estates would also be suitable in the circumstances of Helsinki.²⁹

26. Quoted in Fraser 1979, p. 37.

27. B. Seebohm Rowntree, *Poverty: A Study in Town Life*, London 1901; Henry Jephson, *The Sanitary Evolution of London*, London 1907.

28. Reulecke 1985, pp. 33—35.

29. Helsingfors stadsfullmäktiges tryckta handlingar 1877, Nr 6, pp. 1—3.

In 1876, at the very beginning of industrialization in Helsinki the attention of the Governor General and the Senate of Finland were drawn to the miserable state of the working class dwellings in by the initiatives of its Municipal Officer of Health and its Chief Constable. Because of these initiatives and also as a result of an article on the matter in the *Åbo Tidning* the Governor General invited comments from the Helsinki City Council on the issue. The report of the sub-committee appointed by the Council affirmed that, in principle, the improvement of the housing conditions of the working class was a good idea and it was considered as an advantage of the Mulhouse model that the working class were tied to their own homes and gardens so that they would feel a greater responsibility for keeping their homes neat and tidy.

On the other hand the application of the Mulhouse model in Helsinki would be hindered first of all by the fact that when measured by the volume of its industry Helsinki did not belong to the same category as cities in Alsace and that the majority of the workers in Helsinki did not so far have any permanent occupation. The second disadvantage of the model was that it was expensive to implement and that therefore the workers would have to be satisfied with cheap rented tenements. It was suggested therefore in the report that it should not be a condition for getting a loan (from a benevolent fund) that the dwellings were to be constructed on the lines of the Mulhouse model. Nevertheless, if among the loan applicants there were those who favoured that model, they should be given preference over the others. In the same connection it was also suggested that sites for working class housing estates should be reserved in good time.

This is an example of how the issue of working class housing, which was a common problem of industrialization all over Europe, was anticipated in Helsinki well before the onset of the most hectic growth period in that city. However, it also indicates that Helsinki was still in that stage of growth when the problems of the working classes were not yet broadly recognized on the political level. This supports the theoretical study presented earlier in chapter 2.

In large cities small reforms, however, hardly made any impact as Asa Briggs so tellingly puts it:

"Even when a labour movement developed (and as it developed it was very slow to develop the demand for improved health and housing) even when working hours were cut, even when social investment increased, even when attempts at planning were made, and even when engineering and medical skills improved, as they did in the last phases of Queen Victoria's reign, the city remained a centre of problems. Far more remained to be done than had been done."³⁰

The role of individual decision-makers was crucial in the development of cities. Most changes, however, were the result of a multitude of single decisions, public or private, which inevitably led to bargains and compromises, which were not necessarily always the most beneficial for the cities as a whole. As Asa Briggs argues:

"It is difficult to avoid the conclusion that if half the technical skill applied to industry had been applied to the Victorian cities, their record would have been very different. As it was, Victorian cities were places where problems often overwhelmed people."³¹

On the other hand Asa Briggs emphasizes also the positive side of the Victorian cities: the fact, for example, that they gave the middle class an opportunity to participate in social affairs:

"They [Victorian cities] were never mere collections of individuals, some weak, some strong. They had large numbers of voluntary organizations, covering a far wider range of specialized interests than was possible either in the village or the small town."³²

Another characteristic of the whole of Europe was the lack of representation of the lowest social classes in municipal government. So it was not for example until 1903 that the first

30. Briggs 1975, pp. 22—23.

31. Briggs 1975, p. 22.

32. Briggs 1975, p. 24.

representative of the working class became a member of the City Council of Stockholm.³³

In Stockholm the establishment of some municipal services like public libraries (folkbibliotek) was delayed until the 1920's³⁴ and in England such delay in the development of services was partly due to the fact that existing organizations of landowners and ratepayers worked as effective pressure groups "against unnecessary investments".³⁵

The establishment of services had, indeed, wider social importance as is the case with town planning also. Anthony Sutcliffe describes the objectives of the idea of town planning thus:

"... the efforts of technocratic or social elites to set up a painless method of social reform which would remove the grievances of the poor while educating them into the values of their social superiors. From this point of view it is important to recognize that the years 1890—1914 were a time of growing social tensions, in which the idea of rationalizing the structure of cities acquired an unprecedented appeal. If lower rents, better housing and richer community facilities could remove the need for a major redistribution of income or wealth, then urban planning had a great deal to offer the middle and upper classes in addition to the simple creation of a pleasant urban environment."³⁶

The term, Municipal Institution, widely used at the beginning of this century covered a very wide area of services. Some

33. Yngve Larsson, *På marsch mot demokratin. Från hundragradig skala till allmän rösträtt 1900—1920*. Monografier utgivna av Stockholms kommunalförvaltning, Stockholm 1967, p. 27.

34. Marjatta Hietala, *Servicefaktorn i Helsingfors och Stockholm. En komparativ analys av utvecklingen kring sekelskiftet*, in: Thomas Hall (ed.) *Städer i utveckling*, Stockholm 1984, p. 160.

35. See David Cannadine, *The Calthorpe family and Birmingham, 1810—1910: A 'Conservative interest' examined*, in: *The Historical Journal* XVIII, 4, 1975, pp. 725—760; Avner Offer, *Property and Politics 1870—1914. Land-ownership, Law, Ideology and Urban Development in England*, Cambridge 1981, p. 221—241; Edward Bristow, *The Liberty and Defence League and Individualism*, *Historical Journal* XVIII, 4, 1975, pp. 761—789.

36. Sutcliffe 1981, p. 208.

politicians, like Joseph Chamberlain, held the opinion that establishments of this kind were beneficial in bringing all classes to work together and thus functioned as buffers against any notion of social reformation. When Secretary of the State for the Colonies he pointed out in a speech at a banquet in Birmingham in 1896 that

"In our municipal institutions we find no longer, if it ever existed, the narrow and the provincial spirit. Our functions have been continually extended, until now there is hardly anything too great or too small for the work of these great corporations in our provincial cities, and all men to whatever class they belong, whatever may be their intellectual or other capabilities, may find ample scope for an honourable ambition. The highest ambition that any man can entertain is to leave the world a little better than he found it and it seems to me that the municipal institutions of the country are the most potent instruments that politicians have yet devised for adding to the welfare, the prosperity and the happiness of the whole community. They give the opportunity to fulfil those obligations. They bring all classes together in common work for the common good, and in that way they constitute a wise alternative to those revolutionary proposals for social regeneration which sometimes find currency amongst ignorant people, but which if carried to their natural results would produce nothing but anarchy and national disaster. I say, then, that the proper conduct of these municipal institutions is essential, is important at any rate to all classes of the community; but to the working classes it is a matter almost of necessity. It is the only means by which constitutionally their condition can be improved, their surroundings can be raised, their opportunities enlarged. And we must bear in mind that the prime objects of municipal institutions are to bring together all classes in a wise co-operation for the common good by means of which you may bring within the reach of all opportunities.



Figure 2.

Advertisement of a Charlottenburg firm portraying a goddess symbolizing the modern city, crowned with a wall and sitting on a sewer pipe. (*Städte-Zeitung* May 25, 1906)

necessaries, luxuries which otherwise would only be the enjoyment and the privilege of the few — health, comfort, recreation, education. These are the prime objects of our municipal work, and every working man owes a great part, more perhaps than many of them are aware of, of such happiness and comfort and privileges as they now enjoy to the good working of our municipal institutions. On what depends the success of our municipal work? It depends upon three things, and upon three things only upon the character and the ability of the men who for the love of their work serve the town in the capacity of its elected representatives; it depends, in the second place, upon the ability and integrity of the permanent officials; and it depends in the third place, upon the intelligent interest which is taken in public work by the bulk of the electors of this city.³⁷

Sometimes for the politicians and authorities the productivity of services was more important than the welfare of individual

37. Mr. Chamberlain and Municipal Progress, London 16.7.1896, p. 679.

citizens. The interest of private citizens had to give way to the interests of trade and industry.

"Still, no visitor in 1900 could mistake England's Manchesters. They remained foremost places of work. All improvement, whether humanitarian, educational or recreational, advanced the faster for serving that end. Sanitary reform was business sense as much as moral sense. Healthier workers would improve industrial output, and individuals and public authorities would be spared unproductive expenditure in hospital and funeral charges. Certainly a social conscience inspired civic improvements; but it is an error to neglect business needs."³⁸

At the turn of the century, as today too, it was generally accepted that the services had two kinds of functions for the decision-makers. On the one hand they were used as pull factors, to attract industry but on the other hand many services, as for example parks, recreation grounds, swimming baths etc., promoted the welfare of the individual human being.³⁹ From the beginning, therefore, major decisions were involved as to which function should be given financial priority.

The huge amounts of debt which were created by the establishment of the services, like building the infrastructure, were discussed in many meetings of associations of cities and towns.⁴⁰ Gas and electricity taxation for example were suggested in Germany as a remedy for the situation.⁴¹

38. Waller 1983, p. 84.

39. Fr. W. Schirmer, *Das Anleihewesen der deutschen Großstädte*, *Städte-Zeitung* 22.11.1907, pp. 97—99. Concerning the parks as cleaners of air and promoters of a higher standard of health among the population, see for example Dr. Koch, *Straßenreinigung und Besprengung, Parkanlagen und Kanalisation im Jahre 1890*, *Stat. Jb. Deutscher Städte*, Jg 3., pp. 85—88.

40. Bericht des Vorstandes über die Prüfung der Kreditverhältnisse der deutschen Städte (auf den Beschuld der Hauptversammlung in München), Mitteilungen der Zentralstelle des Deutschen Städtetages, Nr. 13/14 1908, Berlin 1908.

41. Die Verhandlungen des Zweiten Deutschen Städtetages, *Kommunale Rundschau* 31.8.1908, pp. 435—436; E. H. Dietzsch, *Die Städte und die Elektrizitäts- und Gas-Steuer*, *Kommunale Rundschau* 31.8.1908, pp. 434—435.

Christian Engeli has investigated the problems to which the representatives of cities, who participated in the meetings of associations of towns and cities wanted to get answers and on which topics they sought debates. When exploring the questions presented in the regional meetings of the associations of towns and cities from 1870 to 1884 he has included meetings held in Bavaria, Brandenburg, Brunswick, Hanover, Hesse, East Prussia, Saxony, Schleswig-Holstein, Thuringia and Westphalia. According to Engeli one third of the matters raised in the meetings was concerned with social welfare and health care — after all this was the period of the creation of German social welfare legislation. Relatively equal attention was paid to the questions of personnel as well as to the rationalization of municipal administration and continued to do so up to the outbreak of the First World War.

During the next period of observation, from 1885 to 1899, issues of social policy were still the biggest single topic of debates but the share of debating time devoted to them had decreased from 34 per cent to 20 per cent. Infrastructural services and urban technologies required proportionally an increasing amount of attention, and sewerage, electricity, gas and tramways were amongst the most widely debated matters.

This period also saw the emergence of economic matters as topics for discussion, for example the finding of new sources of income for towns and cities was considered an important issue — the fact being that the expansion of the tasks of the municipal administration was bound to incur extra costs.

From 1900 to 1914 matters relating to taxation (*Realsteuern*) and housing emerged in debate agendas and there were discussions on how far the cities should take part in the production of dwellings. Other problems arose from the fact that matters related to schooling now became very topical. In particular the expansion of primary schooling as well as of special schools (*Sonderschule*), continuation schools, needlecraft schools, home economics institutes and other vocational schools awoke increasingly general interest at the meetings of the associations of cities and towns.⁴²

42. Christian Engeli, *Zur Geschichte der regionalen Städtetage*, Archiv für Kommunalwissenschaften, 19. Jg. 1980, pp. 183—184.

One form of hierarchy of services as provided by cities was outlined in 1908 in an article, which discusses borrowing by the large German cities. The author of this article had questioned them about which activities they considered to be profitable or unprofitable. In the cities' own opinion services seemed to fall into four categories:⁴³

<i>profitable according to all cities</i>	gas works tramways and small railways waterworks electricity works harbours and docks harbour railways cattle yards and slaughter-houses
<i>profitable in the view of some cities</i>	sewerage markets acquisition of land nursing and health care institutions
<i>unprofitable in the view of some cities</i>	nursing and health care institutions sewerage acquisition of land markets
<i>unprofitable according to all cities</i>	streets, subways, pedestrian bridges schools administrative buildings bridges public institutes water theatres enterprise funds military objects

43. Fr. W. Schirmer, Das Anleihewesen der deutschen Großstädte, Städte-Zeitung 22.11.1907, pp. 97—99; The Survey by the Statistical Office of the city of Nuremberg was based on questionnaires sent to 23 large cities.



Figure 3.
Advertisement of a Berlin electrical firm. (*Deutsche Gemeindezeitung*
March 10, 1897)

This hierarchy of services is an interesting manifestation of the values characteristic of cities in the stage of accelerating growth. It is worth noting that the water supply system and streets, i.e. the basic infrastructure had been already constructed; and that in 1908 they were no longer considered profitable. It is also interesting that at the time, in 1908, the investment by cities in 'human capital' or education was not considered to be as profitable as various forms of infrastructure. Debate on matters of schooling began more extensively only in 1900—1914 as Engeli has shown.⁴⁴ Similarly for example theatres and other services connected with leisure time, like libraries, do not appear among the profitable enterprises. The low positioning of the health care institutions is a result of the fact that matters relating to them had already been emphasized earlier.⁴⁵

Four years earlier, in 1904, Professor Schwarz had presented another viewpoint, that of services as a means of attracting industry.⁴⁶ In his article Schwarz emphasized the importance of road networks, sewerage, public lighting and policing, although schools and other welfare institutions were also to be considered, but with some reservations, for these were burdensome to the tight budget of a city. In any case industry was not really attracted by such services; more important was the impact of factors related to the location of industry itself — like the vicinity of railways or waterways, of raw materials and especially coal — and of the tax reliefs offered by the municipality.

At the same time migration to the city was observed to promote the existence of a population with greater purchasing power, which raised the local price level and soon also the price of houses.

The hierarchy of services was also reflected in the *Statistisches Jahrbuch Deutscher Städte*. When examining which services were the first to be included in its statistics and the accuracy with which information was dealt with, it is possible to notice some similarities of order to the above

44. Engeli 1980, p. 184.

45. Ibid.

46. O. Schwarz, Die Heranziehung von Industrien, *Städte-Zeitung* 25.3.1904, pp. 335—336.

mentioned hierarchy of needs. Interest was first focussed on questions related to infrastructure — roads, water supply and sewers — population and physical environment (housing and construction). Only in the years 1899 and 1911 was information on theatres given in the *Statistisches Jahrbuch Deutscher Städte* and on libraries only in 1895, 1899, 1900, 1901 and 1911.⁴⁷

In Great Britain traditionally the main interest was focussed on health services. The *Comparative Municipal Statistics* presented information on the following aspects of health care services, (using the term in the widest sense) provided by British towns and cities for the maintenance of the health of their population: baths and washhouses, cemeteries, prevention and cure of animal disease, food and drugs, hospitals, house and trade refuse collection removal and disposal, street cleansing and watering, the housing of the working classes, lunacy policy, parks, recreation grounds and open spaces, sanitary expenses in ports, sewerage and sewage disposal.⁴⁸

Measuring services

As pointed out above services are intrinsically bound up with the values, culture and customs of a particular period and the forms in which the services are provided are determined by the existing scale of economic resources and human capital at a given time. The conditions of living and urbanization on the one hand increased the need for services — for the curing of obvious social problems, for instance — and on the other hand they also imposed certain constraints on the development of services. After all, it can be claimed that the production of services is closely connected with the level of development of each particular area (municipality/city). In each case the existing views about the needs of man, of different human groups and of society have influenced the development of services, i.e. the production of nonmaterial commodities.

47. *Statistisches Jahrbuch Deutscher Städte* (=Stat. Jb. Deutscher Städte), Jg. 20, pp. XI, XV.

48. *Comparative Municipal Statistics*, p. XXIV.

Indeed, the question of how far the decision-makers' opinions on various needs really coincided with the expectations of the city-dwellers themselves is a very interesting but unfortunately almost unresearched problem so far. On the basis of the existing research, however, it is clear that the motives for developing services varied greatly depending on the individual planners and decision-makers. In addition varying opinions on the real interests of cities as well as the problem of resources had to be taken into account, as has been demonstrated above.

The need for private services can be traced more readily to the demands emerging from the environment and from private individuals. Nowadays this demand is proved to be linked also to an increase in the levels of income and education among the population.

A study of the development of public services can begin from the viewpoint of municipal decision-making. So far as this is concerned the level of services and the resources devoted to them can be observed at four different levels:

- 1) expenditure on producing services at a certain time,
- 2) production facilities and capacity (i.e. staff and capital) which have been financed earlier with funds allocated for producing services,
- 3) the performance of services, provided with (2.)
- 4) the impact of services on their target areas as well as their previous standard (e.g. reduced morbidity or lower infant mortality as manifestations of their impact on the general standard of health)

On this basis it is possible to find empirical counterparts to most of the service sectors included in this study, e.g. infrastructure, health care, education, leisure time provisions — and they are discussed further at the beginning of the chapters dealing with the development of each particular sector. So far as health care services are concerned the following operational variables can be discovered at the above mentioned four levels, *although they will not all* be dealt with in this present study:

- 1) cost of health care,
- 2) number of doctors and other staff, hospitals and beds,
- 3) treated patients,
- 4) infant mortality, average age, death rate, and the remaining life expectancy.

In the case of infrastructural services, like water for example, the respective operational variables were:

- 1) establishment of water works and their cost,
- 2) the length of water mains,
- 3) consumption of water,
- 4) improved public hygiene and the decrease in the rate of morbidity.

When studying the level of services in earlier periods one of the major questions is the evaluation of the quality of services. The earlier statistical sources supply very little information about this aspect and thus the conclusions have to be drawn mainly from other sources. Of course it is possible to assess the quality of some services on the basis of performance, e.g. treated/cured patients. Apart from quantity and quality the mere existence of some services can also be occasionally enough — for example in order to display the activity of the city decision-makers or to confirm the preferential ranking of the services.

So far as the study of the public services is concerned legislation has a central role. However, before there is any legally confirmed obligation to provide a particular service there is an interesting phase where the factors peculiar to the voluntary development of services are displayed.

Besides legal obligations and value preferences the development of technology is another factor in the external environment, which has an effect on the production and the level of services. The progress of technology causes for example the replacement of some services by new ones — such as gas by electricity.

4. The Aims, Methods and the Structure of the Study

As a result of industrial urbanization the towns had to adapt to rapidly changing technology and social patterns, as a result of which the character and functions of whole districts could change in a few years, placing new demands on the building stock, communications and general services.

The aim of this study is to explore how a number of German cities were able to meet this challenge between 1880 and 1910, a period of hectic urban growth and the heyday of industrialization. How did the standard of services develop in cities with such different characteristics, industrial structure, location and level of development? Was the development similar everywhere or is it possible to discern significant time lags in the establishment of such services? How and in which sectors did the supply of services differ as between the cities? Were there for example differences in the volume of services in cities when cities were at different stages of growth?

This study concerns 44 large and medium sized German cities, whose population exceeded 50,000 inhabitants in the Census of 1.12.1885 and which are also the subject of the first volume of the *Statistisches Jahrbuch Deutscher Städte*. By the beginning of the First World War the population in most of these towns already exceeded 100,000 (cf. Appendix III). Some comparisons are made with 16 towns and cities in England, Wales, Scotland and Ireland, even though the information concerning them was available only for 1911 and 1912. Due to the nature of the sources, the *Statistisches Jahrbuch Deutscher Städte* and the *Comparative Municipal Statistics*, it has been possible to include not only services provided by the cities, but

also many services from the private sector, although the collecting of statistical data for these has generally been spasmodic and accidental. — In addition comparisons are made with some Nordic towns.

The main emphasis of the analysis is at the intermediate level, i.e. at the level between the macrolevel at which matters are discussed on a national scale such as the general development of towns and services in the whole country and the microlevel where matters are dealt with relating to an individual town, an individual service or a single decision concerning the establishment or development of services. Thus this study explores groups of services, different types of cities and towns, various stages of the growth of cities etc.

Information derived both from macro and microlevels are nevertheless also employed when carrying out analyses at the intermediate level. When the microlevel information is used, this is as a case study, i.e. as a representative example to illustrate the analysis.

Because of the level of investigation and also because of the great number of cities included in this study the statistics of individual cities have not been used — except in the case studies — but comparative material relating to the cities, such as comparative statistics, have been employed instead.

The aims of this study are as follows:

— Firstly to explore *how the supply of services developed in different types of cities* and how the cities reacted to the need to develop services. For this purpose a classificatory system of cities has been formulated and the point of departure is that the groups of cities were as internally homogeneous as possible and at the same time were able to explain as great a variety of different types of services as possible. The object is to find a typology of cities, which has validity in explaining the origin and the development of services.

— Secondly to *investigate services* from the following sectors: infrastructural services, health care services as well as some educational and leisure time services. Suitable operational indicators were sought for the statistical analysis. The problem

of measuring services has already been discussed in chapter 3. Often the sources themselves prevent measurement being carried out at as many levels as might have been desired.

When the most appropriate variables concerning services have been selected the aim is to find those factors which best explain the birth of services, their incidence and variation in different types of cities during the period under review.

— Thirdly to explore the *diffusion routes of those innovations* which are closely connected with the services development. Similarly under investigation are the diffusion channels employed to spread innovative ideas as well as the question of whether there were any essential changes in these during the period under review and whether there was any time lag in this spreading of information from one city to another.

— Finally to estimate the role of services and the diffusion of innovations connected with those services in the growth and development of cities.

By using comparisons it is possible to analyze the various strategies for developing services employed in different cities and a tentative hypothesis is presented here that *competition between cities* at the national and international level can explain their policies so far as the development of services is concerned. A further hypothesis is that identification with some model city can advance the birth of services. This hypothesis does much to explain the motives of decision-makers and to discern their reference groups as well as partly also the diffusion routes of innovations.

This research employs the following methods:

1. Statistical analysis

For the statistical analysis data was collected on variables that were regarded as valid as possible for the problems at hand. These are either connected with the development of services and the growth of cities or explain these. So far as the 44 German cities are concerned these variables are collected in the main from the three cross-sectional years, 1890, 1900 and 1910. In the case of certain individual services there are some exceptions to this rule because of the limited availability of the

sources. Comparable information of services for the English, Welsh and Scottish towns is available only for the years 1911 and 1912. The development of services is explained by using crosstabulation, cartographic analysis and regression analysis.

In developing a typology of cities use has been made of discriminant analysis but it has not been felt necessary to present the details of this process. (cf. Appendix II).

2. Theoretical overview

In order to analyze the complex of problems and to specify the relationships to be studied a number of theoretical aspects are examined (cf. chapter 2.).

3. Case studies

It is especially the case that the only possible way to explore the diffusion of innovations is by way of case studies, given the paucity of ready statistical or other sources relating to this matter. Surveys at the micro level are selected so as to provide as typical examples as possible. The 'soft' material, contemporary written materials, such as pamphlets, research reports, articles and accounts of travels as well as other nonstatistical documentation has been examined alongside the statistical analysis, the aim being to explore contemporary values and to find illustrative examples as well as information on the process of decisionmaking. In the final text this method employed by traditional historical research and the results obtained by it play the greatest role whereas the greatest effort was expended in formulating *various valid suitable instruments of measurement*, such as the suitable typology of cities.

The structure of the empirical part of this study is as follows: chapter 6. discusses the city as an object of research and presents the classification of cities. Chapter 7. deals with the growth of cities, chapter 8. their administration and chapter 9. their economic basis. Chapter 10. analyses the debate on municipal ownership carried on during the period under review.

The actual analysis of the services according to each category of city is to be found in chapter 11. (infrastructural services),

chapter 12. (health care services) and chapter 13. (education and leisure time services). Each of these chapters contain also a survey of innovation. The most detailed observation of the channels for the diffusion of innovations was made by exploring how the innovations related to infrastructural and health care services were spread to Nordic cities (the examples being Helsinki and Stockholm). Innovations are further discussed at various levels in chapter 14., which is the chapter dealing with the actual innovations themselves.

Challenges from recent research

Even though those research findings of urban historians that are available are extremely extensive in both their scope and their volume relatively little comparative research of a proper historical kind has so far been done comparing cities in different countries except in terms of demography. During recent years, however, international comparisons have become more frequent, for example, in the fields of town planning (Dyos, Sutcliffe)¹ and municipal administration (Henlock)². The comparison of municipal services in different countries has naturally been greatly complicated by the diverse practices of various countries, so far as the creation of services was concerned, due to their individual historical, religious and administrative traditions. Even within national boundaries the differences between towns and cities could also be great, as Asa Briggs notes in his study *The Victorian Cities*³. According to Reulecke⁴ a key mistake has been to generalize about developments in services on the evidence provided by a single town or city.

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1. Anthony Sutcliffe, *Towards the Planned City. Germany, Britain, the United States and France 1780—1914*, Oxford 1981; H. J. Dyos (ed.) *The Study of Urban History*, London 1968.
 2. E. P. Henlock, *Fit and Proper Persons. Ideal and Reality in Nineteenth Century Urban Government*, London 1973.
 3. Asa Briggs, *Victorian Cities*, Harmondsworth 1975.
 4. Jürgen Reulecke, *Geschichte der Urbanisierung in Deutschland*, Frankfurt am Main 1985.

Interestingly enough there do exist useful detailed comparisons of developments in German and British cities dating back to the pre-First World War period (A. F. Weber, Dawson, Knoop, Howe, Shaw)⁵. These surveys were not only based on comparative municipal statistics but also utilized personal observations and the findings of study tours (Weber, Howe) carried out by their authors.⁶

Besides the issues, discussed in extensive scholarly studies, relating to the economic, demographic and geographical developments of the cities, recent historical research has certainly discussed also matters connected with the atmosphere of the towns, such as local civic pride and inter-city rivalry (e.g. Asa Briggs). In the case of Germany the increasing self-consciousness of the cities is linked by scholars with the birth of the liberal bourgeoisie and the increase in municipal autonomy,⁷ while in his article *Zur Rolle der Stadt für Industrialisierungsprozeß in Deutschland in der 2. Hälfte des 19. Jahrhunderts* Peter Marschalck emphasizes the active role of the cities in the establishment of services. When creating such services for their inhabitants the towns and cities at the

5. Weber 1899; William Harbutt Dawson, *Municipal Life and Government in Germany*, London 1914; Douglas Knoop, *Principles and Methods of Municipal Trading*, London 1912; Albert Shaw, *Municipal Government in Continental Europe*, New York 1895; Frederic C. Howe, *European Cities at work*, New York 1913.

6. Weber had studied in Berlin in 1890's as well as Dawson; Both Howe's and Shaw's analyses are based on their experiences during study tours in Europe. Modern research has also referred to contacts in administration among the American Progressives. See e.g. Robert M. Crunden, *Ministers of Reform. The Progressives' Achievement in American Civilization 1889—1920*, New York 1982. According to Crunden's analysis both Howe and Shaw belonged to the first generation (born between 1854 and 1874) of creative progressives, pp. 109, 275—6.

The American progressives were interested in particular in the idea that services could be provided by public means. The American publication in 1897 of the 137-page *Bibliography of Municipal Administration and City Conditions* in the first issue of the *Municipal Affairs* magazine well illustrates the enthusiasm with which the civic authorities in American towns followed European developments. Robert C. Brooks, *A Bibliography of Municipal Administration and City Conditions*, *Municipal Affairs*, Vol I, no 1 1897, pp. 1—137.

7. Heinrich Heffter, *Die deutsche Selbstverwaltung im 19. Jahrhundert. Geschichte der Ideen und Institutionen*, Stuttgart 1950, p. 610.

same time established the prerequisites for the location of industry.⁸ Researchers are, indeed, increasingly inclined to discover lurking behind such motives apparently arising from a social conscience hidden evidence of the business mind at work.

One of the scholars who has analysed the issue of inter-city rivalry is P. J. Waller. In his *Town, City and Nation* he, in line with Trevelyan, maintains that:

"...city rivalry was often materialistic. But this statement should not be made disparagingly. It merely acknowledges the *raison d'être* of towns. Economic well-being was the ruling concern of their inhabitants."⁹

Taking the developments of Liverpool, Manchester and Birmingham as examples Waller emphasizes that cities operate within regional systems and are inseparable from them. The distribution of resources and the types of activity that fall within regions set limits to the opportunities for development in particular cities. Because of her one-sided industrial structure Manchester never became a rival to Birmingham, which continued to develop new work and services as a result of her heterogeneous trades and her flexibility of production. The rivalry between Liverpool and Manchester on the other hand was, according to Waller:

"...one of the most pregnant episodes of late-nineteenth-century English urban history. It was a classic case of inter-city rivalry within a situation of inter-city dependency."¹⁰

In his latest work *Geschichte der Urbanisierung in Deutschland* Jürgen Reulecke emphasizes the way cities developed into open societies (*offene Gesellschaft*).¹¹

8. Peter Marschalk, Zur Rolle der Stadt für den Industrialisierungsprozeß in Deutschland in der 2. Hälfte des 19. Jahrhunderts, in: Jürgen Reulecke (ed.), *Die deutsche Stadt im Industriezeitalter*, 2. Auflage, Wuppertal 1980, pp. 60—61.

9. Waller 1983, p. 85.

10. Waller 1983, pp. 86—87.

11. Reulecke 1985, pp. 14—20.

But so far research has concentrated on exploring inter-city contacts from the point of view of town planning.¹² I must therefore agree with the statement of Malcolm Falkus:

"It is worth emphasizing that the whole arena of local government activity and its relation to economic and social life sorely needs more attention from economic historians."¹³

As was mentioned in the previous chapter geographers were the first group of scholars to focus their attention on the incidence of various services in different types of cities.¹⁴ This arose from the assumption that municipal services are central functions which affect the attractiveness of any particular city. Thus Hans Heinrich Blotevogel in several of his studies has applied to the historical material available on German cities a system of classification which considers cities as 'centres'¹⁵ using census data from 1895, 1907 and 1939. It is natural, however, that studies of this sort have perhaps not paid adequate attention to the cities' own role or to their own historical development.

In the research available the incidence of services is generally considered as a measure of the level of development. Scholars have, for example been especially interested in assessing intellectual resources: in the case of educational services particular attention has been paid to the fields of learning with which the highest educational institutions were concerned and to their curriculum.¹⁶ Also the incidence of many other cultural services ranging from theatres to publishing companies has been used as a measure of the level of development.¹⁷

12. Sutcliffe 1981, pp. 47—49, 68—71.

13. Malcolm Falkus, *The Development of Municipal Trading of the 19th Century*, Business History 1977, Vol. XIX, Nr 2, pp. 134—161.

14. Christaller 1933; Lösch 1940; Isard 1956; B. J. L. Berry and A. Pred, *Central Place Studies. A Bibliography of Theory and Applications*. Regional Science Research Institute, Bibliographical Series no 1, Philadelphia 1961.

15. Hans-Heinrich Blotevogel, *Untersuchungen zur Entwicklung des deutschen Städtensystems im Industriezeitalter. Polarisierung und Dezentralisierung in der Entwicklung der höherrangigen Zentren und ausgewählter kultureller Stadtfunktionen*, Habilitationsschrift, Bochum 1980; Blotevogel 1983, pp. 143—185.

16. Michael Sanderson, *The Universities and British Industry 1850—1970*, London 1972.

17. Blotevogel 1983, pp. 143—185.

In his study *Urban Growth* B. T. Robson gives a very interesting analysis of the growth of British cities, where 'urban economic and population growth depend on the adoption of critical innovations'. Gasworks and streetlighting, building societies and telephone exchanges are studied for their effects on the internal operations and external relations of the towns. Robson relates the sluggish growth of the large cities in the late 19th century to the shrinking rate of innovations. The climate created by indecision about the demarcation of central and local government authority and about areas of private and municipal activity, was injurious to the development of large-scale utilities.¹⁸

Of the various services the scholars have paid particular attention to the infrastructure, the establishment of which is, after all, closely connected with the safeguarding of the prerequisites for all activities in a large city.¹⁹ So, for example, the work *Die Urbanisierung im 19. und 20. Jahrhundert*, edited by Hans Jürgen Teuteberg, employs an international comparative approach to areas like the water supply and sewerage²⁰ as well as to town planning.²¹ Extensive comparative analysis can also be found in studies of housing in large cities published by the Institut für vergleichende Städtegeschichte in Münster as well as in Wolfgang Krabbe's work *Kommunalpolitik und Industrialisierung*²². Since the beginning of this

18. Brian T. Robson, *Urban Growth: an Approach*, London 1973.

19. Reulecke 1985, pp. 56—62.

20. John von Simson, *Water Supply and Sewerage in Berlin, London and Paris: Developments in the 19th Century*, in: Hans Jürgen Teuteberg (ed.), *Urbanisierung im 19. und 20. Jahrhundert. Historische und geographische Aspekte*, Cologne 1983, pp. 429—439.

21. Anthony Sutcliffe, *Urban Planning in Europe and North America before 1914: International Aspects of a Prophetic Movement*, in: Hans Jürgen Teuteberg (ed.), *Urbanisierung im 19. und 20. Jahrhundert. Historische und geographische Aspekte*, Cologne 1983, pp. 441—474.

22. See for example Clemens Wischermann, *Wohnen in Hamburg vor dem ersten Weltkrieg*, Münster 1983 and Heinrich Johannes Schwippe, *Zum Prozeß der sozialräumlichen innerstädtischen Differenzierung im Industrialisierungsprozeß des 19. Jahrhunderts. Eine faktorialökologische Studie am Beispiel der Stadt Berlin 1875—1910*, in: Hans Jürgen Teuteberg (ed.), *Urbanisierung im 19. und 20. Jahrhundert. Historische und geographische Aspekte*, Cologne 1983, pp. 241—307; Wolfgang R. Krabbe, *Kommunalpolitik und Industrialisierung*, Schriften des Deutschen Instituts für Urbanistik, Bd 74, Stuttgart 1985.

century some attention has been paid also to the efficiency and functioning of municipal administration by comparing the administrative systems in various cities and dealing with issues such as the centralization of power²³ and the relationship between local and central government²⁴.

The development of services is closely connected also with the general development policies adopted by cities as well as with their wealth and willingness to take financial risks, which can be traced in policies related to the raising of loans for infrastructural services. Other factors with a major influence are matters related to landownership and the price of land²⁵ as well as the various stands on development adopted by local authorities and by pressure groups. Among scholars with a particular interest in the activities of these groups which delayed the development of services is Avner Offer who provides a good example in her study *Property and Politics 1870—1913; Landownership, Law, Ideology and Urban development in England*²⁶. The city's upper classes and the power exercised by landowners have interested some scholars,²⁷ while one should bear in mind also that different groups of the population naturally had different interests in the development of municipal services. Thus, for example, Michael Daunton is able to note in his work on Cardiff how the interests of the middle class there lay within their own city whereas the attention of the local elite was far more focussed on international matters.²⁸

Nor have researchers neglected the role of individual decision-makers so far as the all-round development of their

23. Eric E. Lampard, *The Nature of Urbanization*, in: Derek Fraser and Anthony Sutcliffe (eds.), *The Pursuit of Urban History*, London 1983, pp. 3—53.

24. See for example Waller 1983, pp. 240—280; Wolfgang R. Krabbe, *Die Entfaltung der modernen Leistungsverwaltung in den deutschen Städten des späten 19. Jahrhunderts*, in: Hans Jürgen Teuteberg (ed.) *Urbanisierung im 19. und 20. Jahrhundert. Historische und geographische Aspekte*, Cologne 1983, pp. 373—391.

25. Hans Böhm, *Rechtsordnungen und Bodenpreise als Faktoren städtischer Entwicklung im Deutschen Reich zwischen 1870 und 1937*, in *ibid.*, pp. 214—240.

26. Offer 1981, pp. 221—312.

27. David Cannadine, *Lords and Landlords. The Aristocracy and the Towns, 1774—1967*, Leicester 1980.

28. Michael Daunton, *The Coal Metropolis: Cardiff 1870—1914*, Leicester 1977.

cities was concerned. A classic example is provided by the city of Birmingham in the development of which the Chamberlain family, and Joseph Chamberlain in particular, played a very prominent role.²⁹ On the other hand David Cannadine has done interesting research on the power behind the occupational facade there using the Calthorpe Family as an example.³⁰

29. Carl V. Harris, *Political Power in Birmingham, 1871—1921*, Knoxville 1977.

30. Cannadine 1975, pp. 725—760.

5. The Sources of this Study

The sources of this study can be divided into three categories. The first consists of *official statistics and comparative publications* concerned with municipal statistics as well as a number of surveys, originating in administrative decision-making, of the development of various services.

The second category consists of *various handbooks and documents* dating from the period of the study. To this group of sources undoubtedly belong also those comparative publications which resulted from the international debate at the turn of the century on who should own services. For example the debate on municipal trading produced a number of published series, the most important of which was the series of surveys *Gemeindebetriebe. Neuere Versuche und Erfahrungen über die Ausdehnung der kommunalen Tätigkeit in Deutschland und im Ausland* edited by Professor C. J. Fuchs and published by the Verein für Socialpolitik. It contains general surveys of the development of municipal trading in different countries with detailed accounts of municipal trading in particular towns.¹

1. Schriften des Vereins für Socialpolitik:

Bd. 128

Gemeindebetriebe. Neuere Versuche und Erfahrungen über die Ausdehnung der kommunalen Tätigkeit in Deutschland und im Ausland, Leipzig 1908.

Bd. 129.1

Ernst Busse, Die Gemeindebetriebe Münchens, Leipzig 1908.

Bd. 129.2

Otto Most, Die Gemeindebetriebe der Stadt Düsseldorf, Leipzig 1909.

Bd. 129.3

Die Gemeindebetriebe der Städte Magdeburg, Naumburg a.S., Frankfurt a. M., Leipzig 1909. Containing: O. Landsberg, Die Betriebe der Stadt Magdeburg; G. V. Schiele, Die wirtschaftlichen Betriebe der Stadt Naumburg a.S.; August Busch, Die Betriebe der Stadt Frankfurt a. M.

The third category embraces *reports on a number of study tours as well as periodicals* which devoted much of their space to the discussion of municipal development not only in Germany but also abroad. The most important of these are the *Städte-Zeitung* and the *Municipal Journal* (earlier *London*).

The main source for the study of German cities, *Statistisches Jahrbuch Deutscher Städte* (The Statistical Yearbook of

Bd. 129.4

Moericke, Otto, Die Gemeindebetriebe Mannheims, Leipzig 1909.

Bd. 129.5

Jos Ehrler, Die Gemeindebetriebe der Stadt Freiburg im Breisgau, Leipzig 1909.

Bd. 129.6

Bucerus, Die Gemeindebetriebe der Stadt Remscheid, Leipzig 1909.

Bd. 129.7

Paul Weigel, Die Gemeindebetriebe der Stadt Leipzig, Leipzig 1909.

Bd. 129.8

George Goldstein, Hugo Wasmuht, Paul Ochse, Die Gemeindebetriebe der Stadt Halle a.S., Leipzig 1910.

Bd. 129.9

Georg Neuhaus, Die Gemeindebetriebe der Stadt Königsberg i Pr., Leipzig 1910.

Bd. 129.10

Heinrich Lückner, Die Gemeindebetriebe in den Städten, Kreisen und Landgemeinden des Oberschlesischen Industriebezirks, Leipzig 1910.

Bd. 130.1

C. Horacek, Karl Schwarz, K. T. Wächter, L. Bernad, Julius Sylvester, Die Gemeindebetriebe in Österreich, Leipzig 1909. Containing: C. Horacek, Die Gemeindebetriebe der Stadtgemeinde Prag; Karl Schwarz, Die Wiener Zentralviehmarkt St. Marx, Seine Bedeutung für den Viehhandel und seine volkswirtschaftliche Funktion; K. T. Wächter, Die Gemeindebetriebe der Stadt Wien; L. Bernard, Die Gemeindebetriebe der Stadt Wien; L. Bernard, Die Gemeindebetriebe der Stadt Brixen; Julius Sylvester, Die Gemeindebetriebe der Stadt Salzburg.

Bd. 130.2

Gisela Michels-Lindner Geschichte der modernen Gemeindebetriebe in Italien, Leipzig 1909.

Bd. 130.3

Eugen Grossmann, Ernest Brees, Robert Schachner, Gemeindebetriebe in der Schweiz, in Belgien und in Australien, Leipzig 1909. Containing: Eugen Grossmann, Die Gemeindebetriebe der Stadt Zürich; Ernest Brees, Les Régies Communales en Belgique; Robert Schachner, Die kommunale Sozialpolitik in Australasien (Australien und Neuseeland).

Bd. 130.4

H. Berthélemy, Douglas Knoop, Gemeindebetriebe in Frankreich und England, Leipzig 1910. Containing: H. Berthélemy, Les Industries Communales en France; Douglas Knoop, The Trading Enterprises of Manchester.

Bd. 130.5

Emerich Basch, Die Gemeindebetriebe in Ungarn, Munich and Leipzig 1912.

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Jahrg. 4

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Figure 4.

The Städte-Zeitung was a special journal aimed at municipal decision-makers. It presented and discussed numerous subjects ranging from municipal technology to the aesthetic planning of towns and cities. The journal was very informative with respect to the spread of innovations. Meetings of decision-makers, congresses and exhibitions were presented in the journal.

German Cities) was first published in 1890² by the Konferenz der Vorstände der statistischen Ämter und Bureaux der deutschen Städte. This association held congresses in order to standardize the statistical data and to improve its comparability.³ From this source it is possible to draw some

2. Statistisches Jahrbuch Deutscher Städte ed. by M. Neeffe, 1.—21. Jg, Breslau 1890—1916.

Das Jahrbuch was published without interruption till the year 1916 after which it ceased to be published until in 1927 it was started again with the financial aid of the Deutscher Städtetag. From the year 1931 onwards it included information on towns with less than 50,000 inhabitants and the very next year its name was changed to "Das Jahrbuch der Deutschen Gemeinden" (the Yearbook of German Municipalities).

3. The heads of the statistical offices had for the first time held a conference in 1879 in order to debate classification criteria and the launching of a

conclusions on the opinions which were dominant among those concerned about population in the growing cities. These emerge not merely from the discussions it contains but also from the nature of the information which it chooses to include. At the congresses there was much discussion of classification criteria: for example who was considered to be poor and how the statistics of poor relief should be developed.⁴

Statistical bureaux were first instituted in the largest German cities in the 1860's and by the turn of the century such bureaux were functioning in almost every city with more than 100,000 inhabitants — certainly in 31 cities by 1903.⁵

The establishment of the statistical bureaux and the *Statistisches Jahrbuch* facilitated the production of systematic information not hitherto readily available.

The people who participated in the publishing of the *Statistisches Jahrbuch Deutscher Städte* under the leadership of M. Neefe⁶ represented different cities and city bureaux. Many

publication. Between 1879 and 1897 the Konferenz der Vorstände der Statistischen Ämter und Bureaux (later Verband Deutscher Städtestatistiker) organised these conferences irregularly, but later on these became annual occasions. Already in 1888 the association emphasized the importance of collecting comparable data. Verband Deutscher Städtestatistiker (ed.), *Die Städtestatistik im Wandel der Zeit, Berichte über die 1 bis 75 Tagung 1879—1975*, Cologne 1975.

4. See for example Georg v. Mayr, *Deutsche Städtestatistik, Allgemeines Statistisches Archiv, Dritter Jahrgang*, 1893, pp. 346—350.

5. Wilhelm Morgenroth, *Die Gemeindestatistik in Deutschland*, in: Paul Flakampfer and Adolf Blind (eds.), *Beiträge zur deutschen Statistik, Festgabe für Frank Zizek*, Leipzig 1936, pp. 105—124.

The work of the statistical bureaux was discussed in great detail and the staff, publications, budget etc. were presented in a similar way. See for example v. Mayr, *Statistische Ämter deutscher Städte. Personalien, Organisations- und Etatsverhältnisse derselben*, *Allgemeines Statistisches Archiv, Zweiter Jahrgang*, 1891/1892, pp. 737—744.

The thorough introduction to the publications of the statistical offices of cities is included for example in: *Deutsche Städtestatistik am Beginne des Jahres 1903 dargestellt nach den Veröffentlichungen der Statistischen Ämter deutscher Städte. Beitrag des Statistischen Amtes der Stadt Dresden für die Deutsche Städteausstellung in Dresden 1903*, in: Georg von Mayr (ed.), *Allgemeines Statistisches Archiv, Bd. VI. Ergänzungsheft*, Tübingen 1903.

6. *Statistisches Jahrbuch deutscher Städte* ed. M. Neefe in Verbindung mit seinen Kollegen R. Böckh, H. Bleicher, Dr. Büchel, H. Edelmann, Dr. Hasse, G. Koch, Fr. X. Pröbst, K. Zimmermann, *Erster Jahrgang*, Breslau

famous statisticians like Otto Most, Albert Südekum and Hugo Lindemann also contributed with their writing of extensive handbooks and works of reference⁷; some representatives of the statistical offices were also teaching such matters as an academic subject in various universities.⁸ So the compiling of statistics was bound to have great significance in both planning and decision-making.

The *Jahrbuch* claims to cover the most important areas of municipal administration as well as economic data concerning the inhabitants of the cities. The tables are synoptic and supplied with exact commentaries. These statistics were considered to be an excellent aid to municipal administration. There can surely be little doubt that the mere possibility of comparing the facts of their own city with information about circumstances in other municipalities was bound to put pressure on decision-makers to improve the standards of their services and municipal institutions.⁹ It is an impressive model of contemporary city statistics at the international level,

1890. This statistical publication covered the whole of Imperial Germany. Among the experts mentioned Professor Böckh represented Berlin, Dr. Büchel Strasbourg, Dr. Bleicher Frankfurt am Main, H. Edelmann Dresden, Professor Hasse Leipzig, Dr. G. Koch Hamburg, Fr. X. Pröbst Munich and K. Zimmermann Cologne. The editor, Doctor M. Neefe was head of the Statistical Office of the city of Breslau.

7. It is possible to get further information relating to the definitions and the values of the period from these handbooks:

Handwörterbuch der Kommunalwissenschaften, eds. Josef Brix, Hugo Lindemann, Otto Most, Hugo Preuss, Albert Südekum, I—IV Bände, Jena 1918—1924.

Handwörterbuch der Staatwissenschaften, eds. J. Conrad, W. Lexis, L. Elster, Edg. Löning I—VIII Bände, Dritte gänzlich umgearbeitete Auflage, Jena 1909—1911.

Kommunales Jahrbuch, eds. Hugo Lindemann and Albert Südekum, Jena 1908—1913/1914.

8. Just to mention few of them: W. Lexis was teaching at Göttingen, J. Conrad at Halle, George von Mayr and Zahn at Munich, Böckh at Berlin and Otto Most at Münster.

Maximilian Meyer, Zur Geschichte des statistischen Unterrichts an den deutschen Universitäten im 19. und 20. Jahrhundert, in: Paul Flaskämper and Adolf Blind (eds.), Beiträge zur deutschen Statistik, Festgabe für Frank Zizek, Leipzig 1936, pp. 134—160.

9. Gustav Tenius, Statistik des Unterrichtswesens, in: F. Zahn, (ed.), Die Statistik in Deutschland nach ihrem heutigen Stand, Bd. 1, Munich and Berlin 1911, pp. 522—523.

followed by many of the municipal statistics published in other countries.¹⁰

According to Hans J. Teuteberg the *Statistisches Jahrbuch Deutscher Städte* is for the historian an endless source of hitherto insufficiently used material.¹¹

So far as German towns and cities are concerned the data collated from this work can also be supplemented with information derived from the publications *Preussens Städte* and *Das Deutsche Städtebuch*¹², while the data based on statistics on the occupational structure of the employed population are taken from the *Statistik Deutschen Reichs* and is complemented by official statistics from Hesse and Alsace-Lorraine¹³.

The *Statistisches Jahrbuch* is mentioned in publications dealing with the statistics of Germany as a statistics compilation which makes excellent comparisons possible between different cities. Statistics are prepared especially well on infrastructure, for example on building of streets and the surfacing of streets. Also the statistics on saving funds, poor relief and housing as well as on sports services and leisure time services like theatres are worth mentioning.

See for example Emil Tretau, *Übrige Verkehrsstatistik*, *ibid.* Bd. 2, pp. 357—358; Karl Albert Fiack, *Sparkassenstatistik*, *ibid.* Bd. 2, p. 546; Paul Köllmann, *Armenstatistik*, *ibid.* Bd. 2, p. 699; Bernhard Franke, *Grundstücks- und Wohnungsstatistik*, *ibid.* Bd. 2, p. 894; J. F. Kleindinst, *Übrige Bildungsstatistik*, *ibid.* Bd. 1, p. 538; Wilhelm Böhmert, *Wohlfahrtspflege*, *ibid.* Bd. 2, pp. 933—935.

10. It has been the model for the *Annuario Statistico delle Città* — Anno I (1906), Anno II (1907—1908), Anno III (1909—1910), Anno IV (1911—1912), Redatto, per incarico dell'unione statistica delle città italiane, dal Prof. Ugo Giusti, capo dell'ufficio di statistica del comune di Firenze, Firenze 1906—1912; F. Schäfer, *Statistisches Jahrbuch Deutscher Städte*, *Deutsches Statistisches Zentralblatt* 1909, pp. 155—156.

Bulletin de l'Institut International de Statistique, Tome XXVIII, S-Gravenhage-La Haye 1935, pp. 565—608.

About the statistical compilations concerning cities in other countries it is worth mentioning for example *Österreichisches Städtebuch* 1893, ed. die k.k. Statistische Zentralkommission im Verlag der k.k. Hof- und Staatsdruckerei in Wien, 1893.

Comparative Municipal Statistics, ed. London County Council, Vol. 1 1912—1913, London 1915.

11. Teuteberg, 1983, p. 4 footnote 5.
12. Heinrich Silbergleit (ed.), *Preussens Städte*. Denkschrift zum 100 jährigen Jubiläum der Städteordnung vom 19. November 1808, Berlin 1908; Erich Keyser (ed.), *Das deutsche Städtebuch*, Stuttgart 1939—1974.
13. *Statistik des Deutschen Reichs*, Neue Folge, Bd. III, Bd. 107, Bd. 109, Bd. 207, Bd. 209, Bd. 211.

When comparing German cities with the towns and cities of the United Kingdom the most useful source has been first of all the *Comparative Municipal Statistics*¹⁴, but the *London Statistics* and the *Statistical Abstract of London* have also been valuable¹⁵. The *Comparative Municipal Statistics* resulted from efforts made by the Local Government Committee of the Council over several years. The Council subsequently resolved to compile annually a volume of comparative municipal statistics similar to those issued on France, Germany and Austria and on the same lines as the volume of *London Statistics*. Only the first part of the planned work, Volume One 1912—13, materialized, however, because the outbreak of the First World War put an end to any further publication.

One of the main objects in bringing out the *Comparative Municipal Statistics* was to ascertain whether any economies could be effected by making a yearly comparison of the cost of municipal services; in other words, whether any general standard of expenditure on particular services could be laid down, even approximately. This raises a great number of interesting issues about which there is at present far too little annual information available. The comparisons involve calculations of great difficulty and complexity and data in this study concerning England, Wales, Scotland and Ireland has had to be supplemented with information collected from other sources and research literature.

From the turn of the century till the First World War comparative municipal statistics reached a standard never again achieved until very recently,¹⁶ but in addition to statistics the decision-makers could also gain comparative information from numerous journals and periodicals. Among the German journals the most useful ones so far as this study is concerned have been: *Technisches Gemeindeblatt*¹⁷, *Städte-Zeitung*, *Zeit-*

14. *Comparative Municipal Statistics*, ed. London County Council, Vol. 1 1912—1913, London 1915, pp. IV—V.

15. For example rates of wages, *London Statistics. Statistical Abstract for London*, London 1891—1892, 1903—1904.

16. Elisabeth Lichtenberger, *Die Stadtentwicklung in Europa in der ersten Hälfte des 20. Jahrhunderts*, in: Wilhelm Rausch (ed.), *Die Städte Mitteleuropas im 20. Jahrhundert*, Linz 1984, pp. 2—3.

17. *Technisches Gemeindeblatt. Zeitschrift für die technischen und hygienischen Aufgaben der Verwaltung*, ed. Professor Dr. H. Albrecht, Berlin 1898—1914.



Figure 5.

The *Kommunale Rundschau* concentrated especially on municipal land policies. The editors of the journal included specialists in engineering and professors in the field of technology.

*schrift für Kommunaltechnik*¹⁸, *Kommunale Rundschau*, *Monatsschrift für Städtische Bau- und Bodenpolitik*, *Kommunaltechnik und Verwaltungswesen*¹⁹, *Gemeindeverwaltungsblatt*²⁰, *Kommunale Praxis*²¹.

In the English-speaking world one organ directly catering for administrators was *London, A Journal of Civic and Social*

18. Städte-Zeitung. Zeitschrift für Kommunaltechnik, ed. Ingenieur Hans Dominik unter Mitwirkung namhafter Fachleute, Jg. 1—3, Berlin 1903/04—1905/06.

Städte-Zeitung vereinigt mit Deutsche Städte-Zeitung. Zeitschrift für Kommunaltechnik und Verwaltungswesen, ed. Ingenieur Hans Dominik et al., Jg. 4—9, Berlin 1906/07—1911/12.

19. Kommunale Rundschau. Monatsschrift für städtische Bau- und Bodenpolitik, Kommunaltechnik und Verwaltungswesen, ed. Organ des Reichsverbandes deutscher Städte, Berlin 1907/08—1912/13.

20. Gemeindeverwaltungsblatt. Zeitschrift für Selbstverwaltung, Verwaltungsrechtspflege in Angelegenheiten der Gemeinden und Gemeindearbeiten, Düsseldorf/Berlin 1888—1912.

21. Kommunale Praxis. Zeitschrift für Kommunalpolitik und Gemeindesozialismus, ed. Dr. A. Südekum, Dresden 1901—1910.

Progress. This fortnightly progressive magazine, known later as the *Municipal Journal*, was established in 1893 to

"throw light on the problems which are now engaging the attention of our publicist and to help forward the solution. The awakening of the municipal spirit has led the daily press to pay more attention to local affairs and has helped to stimulate civic patriotism. All that relates to municipal industries will receive our attention . . ."

and

"*London* will watch the improvement in lighting, sanitation, building and other aspects of City life as keenly as the progress of municipal government. We shall describe the formation of new streets, the beautifying of our parks, the improved sanitation of our homes".²²

The *Municipal Journal* became an important source for those interested in following international developments and for the progressives in the United States in particular it proved a helpful organ of information.²³ Another good source has been the *Local Government Review* which discussed topical issues such as matters relating to Municipal Trading.²⁴

All these journals specialised at the municipal level in the problems of individual towns and cities. In addition it is necessary to mention other periodicals that have featured in this study: *Allgemeines Statistisches Archiv*²⁵, *Zeitschrift für Sozialwissenschaft*²⁶, and *Deutsches Statistisches Zentralblatt*²⁷. The last of these deals only with the last years of the study

22. London. A Journal of Civic and Social Progress, London 1893—1898, (later The Municipal Journal 1899—1910).

23. "New York and London", London 22.11.1894, p. 747.

24. Local Government Review, London 1909—1912.

25. Allgemeines Statistisches Archiv, ed. Georg von Mayr, Jg. 1890. I Halbband; Tübingen 1890—.

26. Zeitschrift für Sozialwissenschaft, ed. Julius Wolf, Jg 1—14, Berlin 1898—1912.

27. Deutsches Statistisches Zentralblatt, eds. Regierungsrat Dr. Johannes Feig, Geh. Regierungsrat Dr. Eugen Würzburger, Prof. Dr. Friedrich Schäfer, Leipzig 1909—1912.

The Municipal Journal.

No. 656—Vol. XIV.

AUGUST 18, 1906

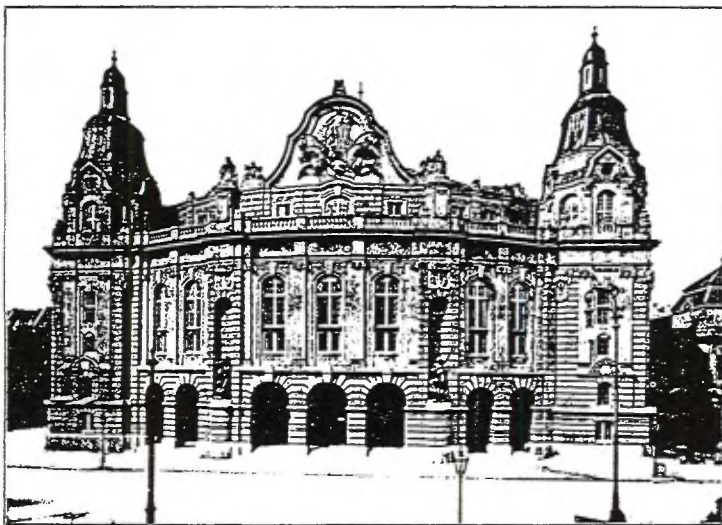
MUNICIPAL THEATRES ABROAD.

At Cologne, in Pursuance of the Policy Generally Adopted in Germany of Fostering Dramatic Art, the Municipality has lately Erected a Palatial Theatre, Attached to which are Restaurants and a Garden. The Building Described.

[BY OUR SPECIAL CORRESPONDENT.]

IN Germany the promotion of dramatic art is considered to be the duty of the public authority, and forms part of the ethical education of the people. A high-class place of entertainment is also an attraction to a city, and gives an opportunity for talent trained in the music schools and conservatories for dramatic art. Hence no town which cares for its reputation is

enterprised in Germany. The building itself cost £125,000, stage equipment, £27,500, decorations and costumes, £25,000. With the provision of an excellent restaurant attached to the theatre, the total cost was £177,500. To appreciate this example of municipal enterprise, we must understand the point of view in Germany. The theatre in Cologne has been erected in a central position,



COLOGNE'S NEW MUNICIPAL THEATRE.

without a municipal theatre. As a rule, the municipalities do not operate the theatre directly, but lend them to a theatre lessee. It is rarely that any rent is charged, but a system of dividing profits is instituted. Generally, however, the percentage which goes to the city is altogether inadequate to pay interest on the cost of building, and very frequently a subsidy is added to maintain the house.

Cologne's new theatre for operas and higher class plays is the latest type erected in Germany, and is perhaps the best institution of the kind. It is a magnificent building, arranged somewhat on the principle of the Paris Opera House, with commodious corridors and lounges. It is one of the finest examples of civic

within easy distance of railway stations and means of communication. It is an imposing-looking building. Attached to the theatre are restaurants, including an open-air cafe on a terrace, and a garden.

In regard to the internal arrangements of the Cologne Theatre our own theatrical architects have much to learn. The stage of the theatre is constructed entirely of iron, and all the mechanical appliances are worked by electricity. The most ample precautions have been made against fire. The ventilation of the auditorium is effected by warm air, cold air being distributed by means of holes in the ceiling, which are electrically introduced as part of the decorative design, while the impure air is drawn off through openings

Figure 6.

The progressive London periodical, *The Municipal Journal* (previously *London*) was especially interested in municipal trading issues both in Britain and abroad. The journal sent correspondents and observers to various countries, for example to report on municipal ownership and related subjects.

period like the *Kommunales Jahrbuch* series.²⁸ Even so, it is possible to draw some retrospective conclusions on the level of services in the cities on the basis of information given in both these publications. Also the contents of the *Verwaltung und Statistik*²⁹ have been most valuable in this respect.

Similarly the reviews of city and world exhibitions are of importance and it is also possible to get from these journals a fair picture of the lectures, initiatives and discussions at the meetings of City Associations.³⁰

The deepest analysis of the development of services were reached in the case of Helsinki. On the basis of the proceedings of Helsinki City Council it was possible to follow discussions held in the Helsinki City Council. Also several travel reports by civil servants were very helpful concerning the diffusion of innovations.³¹ The channels for the spread of innovations are followed with Finnish journals as a source. Especially the speed and the time lag in the adaption of new innovations could be followed very easily.³²

When discussing the diffusion of innovations use has been made not only of journalistic sources but also of travel

28. *Kommunales Jahrbuch*, eds. Dr. H. Lindemann and Dr. A. Südekum, Jena 1908—1913/14.

29. *Verwaltung und Statistik. Volkswirtschaftlich-statistische Monatschrift für die gesamte Reichs-, Staats- und Kommunalverwaltung*, eds. Mitglieder des Königlichen Preußischen Statistischen Landesamtes: Oberregierungsrat Dr. Franz Kühnert and Professor Steglitz, Jg. 1, Berlin 1911/12.

30. In Germany at the beginning of the century the large cities were invited to send participants to these meetings of German city associations. To the first conference representatives were invited from cities with over 25,000 inhabitants (totalling 147), to the second 167 cities and to the third 142 cities. In addition some leagues of cities were also represented.

Verhandlungen des Ersten deutschen Städtetages, Dresden 1905; *Verhandlungen des Zweiten deutschen Städtetages*, Munich 1908; *Verhandlungen des Dritten deutschen Städtetages*, Posen 1911; *Mitteilungen der Zentralstelle des Deutschen Städtetages I—IV*, Berlin 1907—1913/1914.

31. *Helsingfors stadsfullmäktiges tryckta handlingar 1875—1915*. These are in Finnish from the year 1904, *Helsingin kaupunginvaltuuston painetut asiakirjat 1904—1915*; *Berättelse angående Helsingfors stads kommunförvaltning år 1875—1915* (The Finnish edition: *Kertomus Helsingin kaupungin kunnallishallinnosta 1875—1915*).

32. *Yhteiskuntataloudellinen Aikakauskirja*, Helsinki 1906—1915; *Helsingfors Dagblad*, 1870—1910; *Hufvudstadsbladet*, Helsingfors 1899—1904; *Aftonbladet*, Stockholm 1912—1913.

accounts although the number of these still available is unfortunately far from adequate. The most interesting sources of this kind include for example the accounts of the journeys made by those who had participated in the work of the British Committee for the Study of Foreign Municipal Institutions. They discuss the visits of British delegations to the United States, the Nordic countries and Germany as well as the German return visits to Britain.³³ The journeys of individual decision-makers from the Nordic countries to other parts of Europe are reported in printed or unprinted travel accounts, some of which are still available, for example in the archives of the city of Helsinki and in the National Archives.

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33. E.g. Lord Lyveden's Report on the Proposed Journey to Berlin, Cologne, Aix-la-Chapelle, Brussels and Antwerp, in: *Municipal visit to Belgium and Germany*, publ. by British Committee for the Study of Foreign Municipal Institutions, London 1906; Henry S. Lunn, *Municipal Lessons from Southern Germany*, London 1908.
34. E.g. *Reseberättelser av fröken Thyra Gahmberg, inspektör med kommunala medel understödda barntädgårdarna i Helsingfors*, Helsingfors 1913 (Report of the study tour of Thyra Gahmberg to kindergartens of various European cities); *Reseberättelse afgifven till Drätselkammaren i Helsingfors af C. Hausen*, Helsingfors 1889, in: *Helsingfors stadsfullmäktiges tryckta handlingar för 1889*, Helsingfors 1890 (Report of the study tour of C. Hausen for the Board of Finance of City of Helsinki, in: *Published Proceedings of the Helsinki City Council*).

6. The City as an Object of this Research

General

Cities can be studied either from the standpoint of their physical and regional characteristics or from the point of view of their various functions: i.e. as centres of administration, as hubs of trade and commerce or as keypoints in cultural life. A third approach would be to examine them as statistical or judicial units.¹ At the beginning of this century the nature of the city was often defined by using the approaches of administrative law, geography or economics, but these definitions quite soon proved incomplete.

According to the administrative law in Germany a commune is a city only if its administration is urban by nature. Nevertheless even as late as in 1925 there were quite few 'towns' with less than 500 inhabitants when at the same time the population of some 'rural communes', like Recklinghausen for example, exceeded 50,000 people. A similar example is the 'village' of Hamborn, which had over 100,000 inhabitants before it was declared to have the status of town. So any

1. Elisabeth Pfeil, *Großstadtforschung. Entwicklung und gegenwärtiger Stand*, 2. Auflage, Hanover 1972; Wolfgang Köllmann, *Von der Bürgerstadt zur Regional-"Stadt"*. Über einige Formwandlungen der Stadt in der deutschen Geschichte, in: Jürgen Reulecke (ed.), *Die deutsche Stadt im Industriezeitalter*, Wuppertal 1980, pp. 15—17; Marschalk 1980, p. 57; Karlheinz Blaschke, *Qualität, Quantität und Raumfunktion als Wesensmerkmale der Stadt vom Mittelalter bis zur Gegenwart*, in: *Jahrbuch für Regionalgeschichte* 3, 1968, pp. 34—50.

definition on basis of administrative law can hardly be considered adequate.²

Already at the turn of the century Brückner, Hasse, Schott and Schmidt were describing the city as an agglomeration of people and settlements, covering a vast area which is located at the junction of great traffic routes.³ Even this was not an adequate definition for such an agglomeration living by agriculture might still be possible, while the typical features of cities were industry and the provision of services.

So at the turn of the century an unambiguous definition of the concept of the city had yet to be found. It was, however, a quite common practice in Europe to follow the recommendations of the international statistical conferences and to consider as towns those agglomerations of people or settlements with at least 2,000 inhabitants.⁴

The following classification was used in Germany:⁵

country towns (Landstädte)	2,000—5,000 inhabitants
small towns (Kleinstädte)	5,000—10,000 inhabitants
medium size cities (Mittelstädte)	20,000—100,000 inhabitants
large cities (Großstädte)	over 100,000 inhabitants
metropolises (Weltstädte)	over 1 million inhabitants.

The 44 German cities and the 16 cities and towns of the United Kingdom which are the object of this study all belong either to the groups of medium size and large cities or to metropolises (Berlin, London). The lower limit of population is defined as 50,000 inhabitants by the *Statistisches Jahrbuch Deutscher Städte* which is the principal statistical source for this study.⁶

2. Otto Most (ed.), *Die deutsche Stadt und ihre Verwaltung*, Bd. 1, Berlin and Leipzig 1926, p. 6.

3. N. Brückner, *Die Entwicklung der großstädtischen Bevölkerung im Gebiete des deutschen Reiches*, *Allgemeines Statistisches Archiv*, Jg. 1890, pp. 135—184; Hasse, *Die Intensität der Großstädtischen Menschenanhäufungen*, *Allgemeines Statistisches Archiv*, Band 2, 1891/92; Siegmund Schott, *Die Großstädtischen Agglomerationen des deutschen Reiches 1871—1910*. *Schriften des Verbandes deutscher Städtestatistiker*, Heft 1, Breslau 1912; Hermann Schmidt, *Citybildung und Bevölkerungsverteilung in Großstädten*, Munich 1909.

4. *Bulletin de l'Institut International de Statistique* 1887, ii, p. 336.

5. See for example *Statistik des Deutschen Reichs*, Neue Folge, Bd. 32, p. 29.

6. *Stat. Jb. Deutscher Städte*, Jg. 1, 1890.

At the turn of the century the lower limit of population in large cities was considered to be 100,000 inhabitants.⁷

Besides the size of population The International Institute of Statistics took as a criterion of a large city the size of its sphere of influence which was, in the case of large cities (Großstädte, les grandes villes), often national or even international. This definition of 'urban area' on the basis of its area of influence is sometimes more important as a basis of classification when considering the use of private services than the use of the 'city' in the sense of administrative law.⁸ When studying public services, however, there are good arguments for using the more limited definition of city to be found in the administrative law. The unit used in the *Statistisches Jahrbuch Deutscher Städte* is based on the concept of the city, as an area that can be subdivided as the central core and the suburbs. The subdivision into inhabited land and unoccupied land (parks, streets, water areas) is also an interesting and useful one. In relating population density to area a distinction is made between the relationship to the total area and to the built-up area.⁹ So far as the infrastructural services were concerned the systems of water supply and sewerage, tramways, gas and electricity works did not by any means always follow the administrative boundaries of cities and towns. On the contrary the areas they covered by various services might all be of different size, the reason being that most of these services had originated as competitive enterprises of several individual entrepreneurs. A good example is provided by London, where the area known as 'Water-London' was totally different in size from the London covered by gas or electricity supplies. When establishing infrastructural services or bringing them into municipal ownership cities and towns sometimes quite intentionally extended their tramway lines and water mains beyond the municipal boundaries. This practice was the beginning of the policy of industrialization or of organizing further settlement and development.

7. See for example Weber 1899, pp. 15—16.

8. Brückner 1890, pp. 135—184.

9. See for example M. Neefe, Gebiet, Lage und natürliche Verhältnisse der Städte, Stat. Jb. Deutscher Städte, Jg. 2, 1892, pp. 1—9.

As a rule in this study the supply of services is related to the population living inside the administrative boundaries of cities. In those cases where the supply area differs from the administrative area of the city this fact is mentioned separately when discussing each individual service. It is also taken into account when calculating ratios.

The group of 44 German cities used as examples in this study does not include any new cities that at a later stage during the research period reached the level of 50,000 or even 100,000 inhabitants because the aim is to maintain the group as it was in every cross-sectional year, i.e. in 1890, 1900 and 1910¹⁰ though in addition some comparisons are made with towns and cities of the United Kingdom in the years 1911 and 1912 as well as with some Nordic towns (i.e. Helsinki and Stockholm). When making international comparisons as a rule those comparisons are made between cities as defined by their strict administrative boundaries.

The German cities included in this study are Aachen, Altona, Augsburg, Barmen, Berlin, Bremen, Breslau, Brunswick, Cassel, Chemnitz, Cologne, Crefeld, Danzig, Dortmund, Dresden, Düsseldorf, Elberfeld, Erfurt, Essen, Frankfurt am Main, Frankfurt an der Oder, Görlitz, Halle, Hamburg, Hanover, Karlsruhe, Kiel, Königsberg, Leipzig, Lübeck, Magdeburg, Mainz, Mannheim, Metz, Mulhouse, Munich, Nuremberg, Posen, Potsdam, Stettin, Strasbourg, Stuttgart, Wiesbaden and Würzburg.¹¹

The following cities and towns in England, Wales, Scotland and Ireland were also included: London, Birmingham, Leeds, Liverpool, Manchester, Newcastle, Sheffield, Bristol, Cardiff,

10. Sigmund Schott for example has included in his study also the towns which reached the category of great cities (over 100 000 inhabitants) after 1890 which, however, have been excluded from this research. Among these were for example, Charlottenburg, Brixdorf, Duisburg, Schöneburg, Gelsenkirchen, Bochum, Plauen, Wilmersdorf, Saarbrücken and Hamborn. The population of Charlottenburg reached the level of 100 000 in 1900 and the others in the first decade of the 20th century.

Schott 1912, pp. 31—34.

11. Of these cities Frankfurt an der Oder, Görlitz, Lübeck, Metz, Mulhouse, Potsdam and Würzburg were still cities with less than 100 000 inhabitants in 1910 according to the census of December 1st 1910.

Swansea, Aberdeen, Dundee, Edinburgh, Glasgow, Belfast and Dublin.

The research period 1890—1910 was selected as the most suitable one for studying German cities because it coincides roughly with the culmination of urbanization in that country, which took place in 1890—1913, and was also the period of a major increase in urban population and of strong economic growth. During this period the exchange of new innovations between town and town, and country and country, accelerated enormously while decision-makers travelled extensively to congresses and exhibitions dealing with urban development. The starting point of this study is also partly determined by the sources: the first volume of the *Statistisches Jahrbuch Deutscher Städte* was published in 1890, and this to some extent also provides retrospective information concerning circumstances in the previous decade. The statistical information concerning the cities in the United Kingdom deals only with the situation in 1911 and 1912 due to the unavailability of comprehensive source material for other years, though there are a number of new urban monographs which do provide further help in making comparisons between German and British towns.

Classification of cities

Undoubtedly one of the most difficult problems in this study is to explain the differences in the level of services as between cities and how these are related to the location of the city, to its size and to its growth rate, to its industrial structure and to the state of its general development. Indeed, the classification of towns and cities into meaningful categories and typologies is not at all an easy task.

At the turn of the century some scholars, like Sigmund Schott or Hugo Lindemann, classified them according to their geographical location. In his classification Schott mainly used German waterways as the basis of his categories.¹² The towns

12. Schott 1912, p. 39.

and cities that were the subject of this study are divided according to Schott's classification as follows:

- Group 1: cities in the Danube area and South East of Germany (Augsburg, Munich, Nuremberg)
- Group 2: cities of the Upper-Rhine and South West of Germany (Frankfurt am Main, Karlsruhe, Mainz, Mannheim, Strasbourg, Stuttgart and Wiesbaden)
- Group 3: cities of the Lower-Rhine and North West Germany (Aachen, Barmen, Cologne, Crefeld, Dortmund, Düsseldorf, Elberfeld, Essen)
- Group 4: Northern German cities along the river Weser (Bremen, Brunswick, Cassel, Hanover)
- Group 5: cities of Central and Northern Germany along the river Elbe (Altona, Berlin, Chemnitz, Dresden, Erfurt, Halle, Hamburg, Leipzig, Magdeburg, Potsdam)
- Group 6: cities along the Eastern waterways (Breslau, Danzig, Kiel, Königsberg, Lübeck, Posen and Stettin)
- Group 7: all cities which are not included into the previous groups (Görlitz, Frankfurt an der Oder, Metz, Mulhouse, Würzburg).

The emphasis by Schott on the importance of waterways is still useful when classifying some towns and cities of Southern Germany. The group consisting of Nuremberg, Augsburg and Munich is a quite homogeneous one and similarly the grouping of Mainz, Wiesbaden, Mannheim, Karlsruhe, Strasbourg, Stuttgart and Frankfurt am Main seems to be a useful one. On the other hand so far as the cities of Northern and Eastern Germany and the Baltic coast are concerned the building of railways was a far more significant factor. "The impact of the railway helped to differentiate the growth rates of Stettin and its sisters on the Baltic coast".¹³ Subsequent classifications of cities were more often based on their level of industrialization and industrial structure. For example the censuses showed Berlin itself to form one group, the industrial towns of the Rhine and Westphalia another. Further groups consisted of the industrial towns of the Rhine-Main area and of Saxony. Port were dealt with as one entity, and the remaining towns and

13. Lee 1979, p. 281.

cities were divided into two groups, i.e. 'other cities of Northern Germany' and 'other cities of Southern Germany'.¹⁴

Indeed, many researchers discovered at an early stage a significant difference between the nature of those towns where the heavy metal industry dominated and those where textile and consumer goods manufacturing were the main forms of industry. All these cities again differed from the centres of commerce and communication. In this connection researchers with a special interest in studying mobility of population came to the conclusion that the more one-sided the industrial structure of the city the more it was affected by internal migration.¹⁵

Geographers have occasionally applied a central hierarchy classification to historical material. For example Heinrich Blotevogel used, among other things, the censuses and surveys of the industrial structure of those cities in 1895, 1907 and 1939. In his research Blotevogel categorized cities on the basis of three tiers which were further subdivided into nine further tiers. According to Blotevogel the majority of cities could be allocated to the group 'Regionalzentren und Oberzentren'. Hans Dietrich Laux has developed Blotevogel's classification by observing Prussian cities with over 20,000 inhabitants in the censuses of 1882 and 1907 as a basis for his own classification. Differences in the cities' demographic structures are explained by their economic functions. Laux uses his classification mainly for explaining the demographic structures of cities, and the municipal services are then the most essential concepts.¹⁶

But what sort of classification would best suit the study of services?

In this research it was necessary to start positing *an entirely new classification* which could accommodate not only the

14. Wirtschaft und Statistik, Zeitschrift des Statistischen Reichsamts. Sonderheft 2. Vorläufige Ergebnisse der Volkszählung im Deutschen Reich vom 16. Juni 1925 mit einem Anhang. Die abgetretenen Gebiete und das Abstimmungsgebiet an der Saar nach den Ergebnissen der Volkszählung vom 1. Dez. 1910.

15. Rudolf Heberle and Fritz Meyer, Die Großstädte im Strome der Binnenwanderung, Leipzig 1937, p. 141.

16. Blotevogel 1980, pp. 59—72. Hans Dieter Laux, Demographische Folgen des Verstädterungsprozesses, in: Hans Jürgen Teuteberg (ed.), Urbanisierung im 19. und 20. Jahrhundert, Cologne 1983, pp. 65—93.

position of the city in the hierarchy of centres and its location and industrial structure but also its historical development and its administrative status. After all a great number of the German cities were old administrative centres, being either court cities (*Residenzhauptstädte*) or provincial capitals (*Landeshauptstädte*). The theoretical part of this study deals with the development of services during the different stages of cities' growth. Already on the basis of the preliminary analysis it was noted that the development of services was connected not only with the geographical location and the industrial structure of the city but also with the stage of development reached by the city at the time of observation. Therefore an attempt was made to take this also into account when allocating cities to particular groups. From the starting point of the assumed capacity of various types of cities to provide different services the cities of this study were categorized as follows:

- 1) *Commercial cities*: Altona, Bremen, Cologne, Frankfurt am Main, Hamburg, Leipzig, Lübeck;
- 2) *Administrative cities* (court cities): Berlin, Breslau, Brunswick, Cassel, Dresden, Hanover, Karlsruhe, Königsberg, Magdeburg, Munich, Strasbourg, Stuttgart;
- 3) *Metal and mining cities*: Chemnitz, Dortmund, Düsseldorf, Essen, Mannheim, Nuremberg;
- 4) *Textile cities*: Aachen, Augsburg, Barmen, Crefeld, Elberfeld, Mulhouse;
- 5) *Garrison cities*: Kiel, Mainz, Metz, Potsdam;
- 6) *Regional centres*: Danzig, Erfurt, Frankfurt an der Oder, Görlitz, Halle, Posen, Stettin, Wiesbaden, Würzburg;

This classification is based mainly on information concerning the occupational structure of the cities drawn from data collected in 1882, in 1895 and in 1907.¹⁷ From these has been derived quite detailed information. Thus it has been possible to differentiate between civilian civil servants and military personnel in the subsequent classification, the aim being to establish a classificatory system that would throw light on the

17. Statistik des deutschen Reichs, Neue Folge, Bd. III; Statistik des deutschen Reichs, Neue Folge Bd. 107, 109; Statistik des Deutschen Reichs, Neue Folge Bd. 207, 209, 211.

incidence of services (see Appendix I). Also the speed of growth of the cities appeared relevant to this classification. The main objective was to find a system of classification which would be relevant during the whole period of this study. Before adopting this classification several preliminary tests were carried out with the material and this classification also gained support from the discriminant analysis applied to the data (Appendix II).

Even though every kind of classification misrepresents the nature of cities to a certain extent and ignores minor differences the establishment of a suitable classification can be helpful when exploring the development of services.

Of the cities included in this study a particularly distinctive category was *garrison cities*, i.e. towns and cities where the proportion of people serving in the army and military related occupations was considerably greater than in other cities and had remained so during the study period. By 1907 there was still a great difference between garrison cities and those where the proportion of the population engaged in military occupations fell into the second highest category. So for example in Potsdam in that year 19.3 per cent of the population were in military occupations and in Mainz 14.3 per cent. The proportions of soldiers and those engaged in related occupations in Barmen, Dortmund and Elberfeld (0.1 per cent in each) were smallest while the figures are only slightly higher for Essen (0.2 per cent), Aachen (0.3 per cent), Hamburg (0.5 per cent) and Leipzig (0.6 per cent). Although its ratio of military population in 1907 was 12.1 per cent Strasbourg, being the capital of Alsace-Lorraine was, however, classified with the administrative cities.

All in all slow growth was typical of *garrison cities* the only exception being Kiel, where growth between 1871 and 1910 was 560 per cent. This figure reflects the building of a German navy. It is also worth bearing in mind that the population occupied in construction industries as a proportion of all employed people in Kiel also increased markedly during the same period. (See Table 1.)

Another relatively homogeneous group of cities based on the occupational structure of the employed population is that of cities with a *textile industry*. In these cities the proportion of employees in the textile industry remains over 10 per cent during the whole study period whereas the average proportion

Table 1.

The proportion of the population actually serving in the army and navy in garrison cities in Germany in 1895 and 1907.

	1895* per cent	1907 per cent
Kiel	26.7	25.5
Mainz	19.4	14.3
Metz	40.1	30.9
Potsdam	23.2	19.3

* In the figures for 1882 it is not possible to discern the proportion of 'military' population except in cities with over 100,000 inhabitants.

Sources: Calculated on the on the basis of the following official statistics, 1895: Statistik des Deutschen Reichs, Neue Folge, Band 107 and 109 and Beiträge zur Statistik des Großherzogtums Hessen Band 48, pp. 237—381; 1907: Statistik des Deutschen Reichs, Neue Folge, Band 207 and 209 and Beiträge zur Statistik des Großherzogtums Hessen Band 60, Heft 1.

of population employed by the textile industry in all other cities of this study is merely 1.72 per cent in 1895. The following Table 2. demonstrates clearly how this proportion in most of the textile cities well exceeded this limit.

Because the proportion of people employed in the textile industry in Chemnitz was still, in 1907, 15.5 per cent it could also have been included in the category of the 'textile cities'. Because the metal and engineering industries were, however, the growing branches of trade in Chemnitz and because the form of growth in that city differed so markedly from the growth curve of the textile cities it was nevertheless included in the group of metal and engineering cities. The percentage growth of population in Chemnitz between 1871 and 1910 was 321.8 per cent whereas the rate of growth in the textile cities was clearly slowing down by that time. In the same way between 1871 and 1910 it was in Aachen 110.6 per cent, in Augsburg 100.1 per cent, in Barmen 127.3 per cent, in Elberfeld 126.6 per cent and in Mulhouse a mere 77.4 per cent whereas the average growth percentage in all the cities included in this study was 210.7 per cent during the same period.

Table 2.

The proportion of the population employed in the textile industry in the textile cities in Germany in 1882, 1895 and 1907.

	1882 per cent	1895 per cent	1907 per cent
Aachen	13.0	13.9	15.3
Augsburg	15.1	13.9	12.6
Barmen	40.0	36.9	33.2
Crefeld	34.9	30.5	16.2
Elberfeld	27.2	21.1	16.2
Mulhouse	29.5	26.5	24.6

Sources: Calculated on the basis of the following official statistics, 1882: Statistik des Deutschen Reiches, Neue Folge, Band III, and the Statistisches Jahrbuch Deutscher Städte I, pp. 36—39; 1895: Statistik des Deutschen Reichs, Neue Folge, Band 107 and 109; 1907: Statistik des Deutschen Reichs Neue Folge, Band 207 and 209; and Statistisches Jahrbuch für Elsass-Lothringen 1912 p. 301.

It is worth noticing that when classifying cities by occupational structure the category 'industry' includes both manufacturing industry and craftsmen's trades. Because the enterprises of the self-employed were thus also included in the category of 'industrial population' the differences between the various city groups decreased.

Another quite homogeneous group of industrial cities was formed by *cities dominated by either metal and engineering and/or by mining industries*. In the case of Chemnitz, Dortmund, Düsseldorf, Essen, Nuremberg and Mannheim the proportion of the population earning their living from metal, engineering or mining industries was noticeably larger than in other cities included in this study and, in addition, their industrial profile displayed an increasing strengthening of the role of metal industries. The only problem is in the cases of Düsseldorf and Mannheim, multidimensional cities, i.e. cities with a more heterogeneous occupational structure, where one can nevertheless discern a clear trend towards metal industries. (see Table 2.)

The capital, Berlin, was also an important industrial centre

Table 3.

Metal and mining cities. The numbers working in the metal, engineering and mining industries as a proportion of all employed people in Germany in 1882, 1895 and 1907.

	1882 per cent	1895 per cent	1907 per cent
Chemnitz	20.2	20.0	24.1
Dortmund	36.4	30.9	32.7
Düsseldorf	14.2	18.1	20.8
Essen	44.0	39.1	41.9
Mannheim	8.0	11.6	17.6
Nuremberg	15.2	18.0	24.9

Sources: see Table 2.

where the industrial work force, not including people working in construction industries, in 1907 formed 44.9 per cent of the whole employed population. Because of Berlin's status as the capital of the country one is, however, justified in classifying it as an administrative city.

Among the *administrative cities* were included old court cities and centres of regional administration, e.g. Stuttgart, Cassel, Dresden, Karlsruhe, Königsberg, Hanover, Magdeburg, Munich, Strasbourg, Breslau, Brunswick and Berlin. All these cities had a multidimensional character so that they were at the same time both industrialized cities and centres for trade and communications. Their historical status as administrative centres and their highly developed administrative organization justify, however, their designation as a group separate from purely trading cities. Indeed, this study aims to explore whether the long administrative tradition had any impact on the supply of services.

The cities of Bremen, Frankfurt am Main, Hamburg, Leipzig, Lübeck and Altona form a separate group, called *commercial centres and ports*, because most of them were old trading towns, some dating from as far back as the Hanseatic League (Lübeck, Bremen) others being important loading and unloading centres (Frankfurt am Main and Altona). In these cities people engaged in trade and communications formed a

Table 4.

Commercial and harbour cities. The proportion of population employed by trade, insurance and communications of all employed people in Germany in 1882, 1895 and 1907.

	1882 per cent	1895 per cent	1907 per cent
Altona	24.9	24.9	26.4
Bremen	25.2	25.5	26.1
Frankfurt a.M.	27.2	25.4	26.0
Hamburg	29.8	33.0	34.8
Leipzig	22.4	21.4	22.5
Lübeck	24.8	24.5	26.1

Sources: see Table 2.

particularly high proportion of the whole employed population as Table 4. clearly demonstrates.

The final group of cities noted in this study are the *regional centres*. In general they were those that were so multi-dimensional in nature that none of the chief characteristics of the other groups were dominant. Some of these centres were former garrison towns where the importance of the garrison itself was declining. Some had had long administrative traditions or were clearly regional centres with a wide sphere of influence without being affected by the competition from other centres in geographical proximity. In these cities the ratio of population living on independent means, pensions or income from rented property was also significantly higher than average in all the cities explored in this study.

	Regional centres per cent	All cities per cent
1895	8.52	6.41
1907	11.78	9.21

According to the classification of Blotevogel¹⁸ they belong to the lower categories (Oberzentren).

18. Blotevogel 1983, p. 168.

The group of regional centres embraces cities in eastern parts of Germany as well as in central and southern regions (Danzig, Erfurt, Frankfurt an der Oder, Görlitz, Halle, Posen, Stettin, Wiesbaden, Würzburg).

The aim of the classification was to form separate categories of cities with common characteristics, although it would have been possible to present and analyze the data without any further categorization.

From the classification presented above one can notice that some groups are internally heterogenous due to the special characteristics of some of the cities. Thus Berlin differs most obviously from other cities because of the variety of its activities. In this study it is, however, included among the administrative centres because of its historical position. Similarly Wiesbaden differs from other regional centres. In 1907 the proportion of its population living on independent means or on pensions or income from rented property was 17.1 per cent of all those with some occupation while the average in all 44 cities was only 9.21 per cent. Also the proportion of the population employed in the hotel and catering business was particularly large in that city. Being also a spa it had in addition attracted an uncommonly large number of medical practitioners and nursing staff.

Among the cities of this study growth was particularly slow in the following. (see Table 5.)

Table 5.

The growth rate of some German cities (see Appendix IV).

	Percentage growth of population in 1880—1910	Percentage growth of population in 1870/71—1910
Frankfurt a.O.	33.49	58.00
Metz	29.11	35.52
Potsdam	28.48	41.78
Mulhouse	49.37	77.38
Danzig	56.92	91.44
All cities average	140.63	210.67

The classification used in this work finds some support in the studies by Jürgen Reulecke for example where it clearly emerges that the textile cities have a different pattern of development from the other cities.¹⁹ There is also the classification by J. J. Lee who distinguishes five categories among German cities the only exceptions being Kiel and Ludwigshafen, which seem to defy all convenient categorization.²⁰ The first is formed of the old maritime ports (Hamburg, Altona, Bremen) which flourished by virtue of the growing North-Atlantic orientation of German foreign trade in the 19th century while the Baltic ports, Lübeck, Danzig and Königsberg grew much more slowly. The second group, the textile cities, expanded rapidly between 1750 and 1850 but later in the 19th century the growth of Aachen, Crefeld, Elberfeld, Barmen and Plauen, which remained primarily textile towns, fell behind as other growth sectors superseded the textiles. Nine cities in the Ruhr and Saar owed their initial growth to their favourable location in relation to natural resources and maintained their rapid growth later. The inland cities can be subdivided into eleven commercial cities and nine court cities and Lee emphasizes that it was through the railway that the inland communication centres generally consolidated their position, while the apparently more vulnerable court cities transformed themselves into major industrial centres. The court cities had not featured prominently in the first stage, i.e. that of textile industrialization, which tended to develop either in rural areas or less traditional urban centres. The early railway system, however, was based mainly on the state capitals.²¹

Hans-Dieter Laux has also studied the demographic structure of Prussian cities between 1871 and 1914 and has discerned clear differences between East and West Prussia. Thus the industrial towns were clearly located in the western parts of Prussia. The tripartite division applied by Laux (into service, industrial and multi-dimensional cities) with its total of ten subdivisions is most suitable for analyzing the demographic development of cities but cannot be adapted for

19. Reulecke 1985, pp. 28, 210—211, table 8.

20. Lee 1978, pp. 279—293.

21. Lee 1978, pp. 280—281.

the purposes of this study which aims to explore services. The greatest differences between the classification presented above, i.e. the typology of cities employed in this research, and the classification of Laux can be found for example in the fact that *in the classification of this study garrison cities are differentiated from administrative cities and so civil servants and those engaged in the liberal professions have been differentiated from military personnel*. This differentiation is one of the factors that helps to explain the incidence of services.²²

The classification presented above can naturally be criticized simply because of the fact that always during the categorization of the units under observation the picture gained is simplified and some information is lost. It might have been possible to divide the cities into still smaller and more homogenous groups but then those groups would have been far too small for any statistical analysis — given that even the present ones are very near the limit in that respect.

The classification above was created as a tool for exploring the volume and development of various types of services in different cities. It was essential as I have already emphasized earlier, to introduce the approach, of the development of services alongside the stages of growth of the city. An attempt is made also, in various phases of the analysis, to take into account factors relating to the location and the historical development of cities. In addition to the above described classification the following geographical classification has been used:

Location of the city:

- 1) in *the Ruhr area*: Aachen, Barmen, Cologne, Crefeld, Dortmund, Düsseldorf, Elberfeld, Essen.
- 2) in *Southern and South-Western Germany*: Augsburg, Frankfurt a. M., Karlsruhe, Mainz, Mannheim, Metz, Mulhouse, Munich, Nuremberg, Strasbourg, Stuttgart, Wiesbaden, Würzburg.

22. Laux 1983, pp. 65—93; Hans-Dieter Laux, Dimensionen und Determinanten der Bevölkerungsentwicklung preußischer Städte in der Periode der Hochindustrialisierung, in: Wilhelm Rausch (ed.), *Die Städte Mitteleuropas im 20. Jahrhundert*, Linz 1984.

- 3) in *North-Western Germany*: Altona, Brunswick, Bremen, Cassel, Hamburg, Hanover, Kiel, Lübeck.
- 4) in *Central Germany*: Berlin, Chemnitz, Dresden, Erfurt, Halle, Leipzig, Magdeburg, Potsdam.
- 5) in *Eastern Germany*: Breslau, Danzig, Frankfurt a.O., Görlitz, Königsberg, Posen, Stettin.

The cities in Great Britain cannot be observed with the same accuracy because the shortage of statistical material complicates any comparisons related to services. Nor has it been possible to apply the same above mentioned criteria of classification to the 16 British cities. So far as these are concerned a more useful criterion than those based on the industrial structures seems to be the division into English, Scottish, Welsh and Irish cities.

7. The Growth of Cities

Industrialization, vigorous growth of population and internal migration were phenomena which together made a strong impact to the growth of urban population. This development leading to the modern industrial society has not been yet fully studied, however, so that according to scholars new research results can still refine the overall picture of important questions.¹

The process of urbanization was a universal phenomenon which started first in Britain and later in Germany during the early stages of industrialization gaining in strength at the height of that process in those countries. This means that in Britain urbanization continued steadily throughout the 19th century whereas in Germany it reached its peak during the four decades before the First World War.

In Britain the 19th century marks a period of strong growth in population and, indeed, between 1801 and 1901 it increased in England and Wales by 24 millions. According to the 1851 census the entire urban population, i.e. people living in centres with more than 2,500 inhabitants, formed 54 per cent of the total population of England and Wales the respective figures being in 1871 65.2 per cent, in 1881 70.0 per cent, in 1891 74.5 per cent, in 1901 78.0 per cent and in 1911 78.9 per cent. This process was fastest in cities with more than 100,000 inhabitants where the population nearly doubled: in 1851 24.8 per cent, of total population were living in these centres and in 1911 it was 43.8 per cent. In 1901 17.9 per cent of the urban population in England and Wales lived in cities of 100,000—200,000 people, 20.1 per cent in great cities of between 200,000 and a million

1. Reulecke 1985, p. 69.

and 17.9 per cent in the London County Council area, where the number of inhabitants exceeded 4.5 millions. It is possible to generalize by saying that approximately one of every five urban dwellers fell into each of these categories. One can also generalize that even if the urbanization process showed some signs of slowing down in smaller cities² the urban concentration was very strong in England and Wales during the whole of the 19th century when compared for example with the urban concentration in Scotland, Prussia or Saxony, as Table 6. below clearly indicates.³

Table 6.

Percentage of total population in towns of more than 10,000 inhabitants.

	1850 per cent	1890 per cent
England and Wales ¹	39.45	61.73
Scotland ¹	32.20	49.90
Prussia ²	10.63	30.00
Saxony ²	13.60	34.70

1 years 1851 and 1891

2 years 1849 and 1890

Source: Adna Ferrin Weber, *The Growth of Cities in the Nineteenth Century. A Study in Statistics*, New York 1899 (1963), pp. 143—144.

Growth of German cities

In Germany both industrialization and urbanization reached their peak during the four decades before the First World War. Even in absolute terms Germany had never during its history witnessed such a growth in its population. This phenomenon

2. Waller 1983, pp. 6—8.

3. B. I. Coleman (ed.), *The Idea of the City in Nineteenth Century Britain*, London 1973, p. 1; Eric E. Lampard, *The Urbanising World*, in: Harold Jones Dyos and Michael Wolf (eds.), *Victorian City, Images and Realities*, Vol. 1, London 1973, p. 5; Robson 1973, p. 67.

was due to several concurrent trends which could be discerned in the period of 1871—1914, such as the decline in mortality (from 27 per cent in 1871 to 22 per cent in 1900 and 16 per cent in 1910), the increase in the birth rate and significantly also the decline in infant mortality. Even though some 2.7 million people emigrated from Imperial Germany the total population increased from 41 million to 65 million, that is 58.5 per cent during this period. The entire population growth benefited towns and cities with more than 2,000 inhabitants. So the total population of the cities and towns which had been granted the Prussian town charters was some 8 millions in 1871 and had increased to some 19 millions only forty years later in 1910.⁴ The proportion of the population living in cities with more than 100,000 inhabitants was 9.8 per cent on December 1st 1871 and it increased steadily to 11.7 per cent in 1880, to 15.0 per cent in 1890, to 18.0 per cent in 1900 and to 21.3 per cent in 1910, and the joint population of 48 large German cities in fact trebled between 1871 and 1919.⁵ A good indicator of the growth of large German cities is given for example in the following Table 7., where the German cities studied in this research have been grouped according to their population. The amount of the population in 44 German cities is presented in Appendix III.

Of these cities the fastest rate of growth occurred in the relatively young industrial cities (Table 8.). Whereas the old great cities had experienced the most rapid expansion in the 1870's and 1880's, the new large cities, where the total population had quite recently exceeded 100,000 inhabitants, faced the same phenomenon later, in the 1890's and 1900's.⁶ It is worth bearing in mind, however, that in some cases it was not only due to internal migration but also territorial annexations which were carried out during the research period.

The fastest growth rate took place in cities concerned with the metal industry, like Essen and Dortmund, in Kiel where

4. Reulecke 1985, pp. 68—69; Wolfgang Köllmann, *Der Prozeß der Verstädterung*, in: Wolfgang Köllmann (ed.), *Bevölkerung in der industriellen Revolution*, Göttingen 1974, pp. 125—139; Matzerath 1985, pp. 252—259.

5. *Statistik des Deutschen Reichs*, Neue Folge, Band 240, *Die Volkszählung im Deutschen Reich am 1. Dezember 1910*, Berlin 1915, pp. 68—69.

6. Schott 1912, p. 3.

Table 7.

The 44 German cities studied in this research, grouped into four categories according to the population in 1880, 1890, 1900 and 1910.

	1880	1890	1900	1910
50,000	Aachen	Augsburg	Augsburg	Frankfurt a.O.
-100,000	Altona	Cassel	Erfurt	Görlitz
	Augsburg	Dortmund	Frankfurt a.O.	Lübeck
	Barmen	Erfurt	Görlitz	Metz
	Brunswick	Essen	Karlsruhe	Mulhouse
	Cassel	Frankfurt a.O.	Lübeck	Potsdam
	Chemnitz	Görlitz	Mainz	Würzburg
	Crefeld	Karlsruhe	Metz	
	Dortmund	Kiel	Mulhouse	
	Düsseldorf	Lübeck	Potsdam	
	Elberfeld	Mainz	Wiesbaden	
	Erfurt	Mannheim	Würzburg	
	Essen	Metz		
	Frankfurt a.O.	Mulhouse		
	Görlitz	Posen		
	Halle	Potsdam		
	Karlsruhe	Wiesbaden		
	Kiel	Würzburg		
	Lübeck			
	Magdeburg			
	Mainz			
	Mannheim			
	Metz			
	Mulhouse			
	Nuremberg			
	Posen			
	Potsdam			
	Stettin			
	Wiesbaden			
	Würzburg			

Sources: Statistik des Deutschen Reichs, Neue Folge, Band 451, Heft 1. Volks-, Berufs- und Betriebszählung vom 16. Juni 1933. Stand, Entwicklung, und Siedlungsweise der Bevölkerung des Deutschen Reichs, bearbeitet im Statistischen Reichsamt, Berlin 1935, pp. 35—37. Statis-

	1880	1890	1900	1910
100,001	Bremen	Aachen	Aachen	Aachen
-200,000	Cologne	Altona	Altona	Altona
	Danzig	Barmen	Barmen	Augsburg
	Frankfurt a.M.	Bremen	Bremen	Barmen
	Hanover	Brunswick	Brunswick	Brunswick
	Königsberg	Chemnitz	Cassel	Cassel
	Leipzig	Crefeld	Crefeld	Crefeld
	Strasbourg	Danzig	Danzig	Danzig
	Stuttgart	Düsseldorf	Dortmund	Elberfeld
		Elberfeld	Elberfeld	Erfurt
		Frankfurt a.M.	Essen	Halle
		Halle	Halle	Karlsruhe
		Hanover	Kiel	Mainz
		Königsberg	Königsberg	Mannheim
		Nuremberg	Mannheim	Posen
		Stettin	Posen	Strasbourg
		Strasbourg	Strasbourg	Wiesbaden
		Stuttgart	Stuttgart	
200,001	Breslau	Breslau	Breslau	Bremen
-1,000,000	Dresden	Cologne	Chemnitz	Breslau
	Hamburg	Dresden	Cologne	Chemnitz
	Munich	Hamburg	Dresden	Cologne
		Leipzig	Düsseldorf	Dortmund
		Magdeburg	Frankfurt a.M.	Dresden
		Munich	Hamburg	Düsseldorf
			Hanover	Essen
			Leipzig	Frankfurt a.M.
			Magdeburg	Hamburg
			Munich	Hanover
			Nuremberg	Kiel
			Stettin	Königsberg
				Leipzig
				Magdeburg
				Munich
				Nuremberg
				Stettin
				Stuttgart
over				
1,000,000	Berlin	Berlin	Berlin	Berlin

tisches Jahrbuch Deutscher Städte, Jg. 1, p. 23; Jg. 3, p. 270; Jg. 10, p. 93; Jg. 11, p. 108; Jg. 19, pp. 846—847. Silbergleit, Heinrich (ed.), Preußens Städte. Denkschrift zum 100 jährigen Jubiläum der Städteordnung vom 19. November 1808, Berlin 1880, Tabellen, pp. 2—7.

growth was partly due to the construction of a port, as well as in large administrative and commercial cities which were becoming increasingly popular as a location for industry (Düsseldorf, Mannheim, Nuremberg and Frankfurt am Main). At its slowest the growth was during 1880—1910 in small regional centres in the East and in the South, e.g. Frankfurt an der Oder, Görlitz, Würzburg, Augsburg and Danzig, as well as in garrison towns like Metz and Potsdam. On the other hand the latter group includes Kiel, the spectacular growth of which since 1880 is mostly due to the rapid naval expansion launched

Table 8.

Growth of population in different German cities 1880—1910.

Rate of growth less than 100 %	Rate of growth from 100 to 200 %	Rate of growth over 200 %
Lübeck (93.2)	Magdeburg (186.7)	Essen (417.4)
Brunswick (91.3)	Karlsruhe (168.6)	Kiel (385.4)
Altona (89.6)	Cassel (162.8)	Leipzig (295.7)
Breslau (87.6)	Munich (159.3)	Düsseldorf (275.8)
Berlin (84.5)	Stettin (157.4)	Mannheim (262.7)
Aachen (82.5)	Halle (153.0)	Cologne (256.8)
Elberfeld (82.0)	Dresden (148.3)	Nuremberg (234.8)
Mainz (80.4)	Hanover (146.1)	Dortmund (221.9)
Barmen (76.4)	Stuttgart (144.0)	Frankf.a.M. (203.0)
Crefeld (75.2)	Posen (142.8)	Chemnitz (202.6)
Königsberg (74.6)	Hamburg (127.0)	
Strasbourg (71.2)	Bremen (120.0)	
Görlitz (70.6)	Wiesbaden (117.0)	
Augsburg (66.9)	Erfurt (109.3)	
Würzburg (65.6)		
Danzig (56.9)		
Mulhouse (49.4)		
Frankf.a.O. (33.5)		
Potsdam (28.5)		
Metz (29.1)		
20 total	14 total	10 total

Sources: Statistik des Deutschen Reichs, Neue Folge, Band 451, Heft 1. Volks-, Berufs- und Betriebszählung vom 16. Juni 1933. Stand, Entwicklung und Siedlungsweise der Bevölkerung des Deutschen Reichs, bearbeitet im Statistischen Reichsamt, Berlin 1935, pp. 35—37.
Statistisches Jahrbuch Deutscher Städte, Jg. 1, p. 23; Jg. 3, p. 270; Jg. 10, p. 93; Jg. 11, p. 108; Jg. 19, pp. 846—847. Silbergleit, Heinrich (ed.), Preußens Städte. Denkschrift zum 100 jährigen Jubiläum der Städteordnung vom 19. November 1808, Berlin 1908, Tabellen, pp. 2—7.

by the Germans during the closing decades of the 19th century (cf. Table 8.).

The growth of Berlin has been compared to that of some cities in the USA during the same period. In 1870 there were 826,341 inhabitants in Berlin, ten years later the population had grown to 1,122,330 and in 1910 it was 2,071,257. Thus the percentage of growth during these forty years was 150 per cent. As a result Berlin was the third largest city in Europe in 1920 with a population of 3,858,293.⁷ In some traditional industrial cities like Gelsenkirchen the population increased tenfold between 1871 and 1910. In 1880 half of the German cities studied here had more than 91,050 inhabitants. The equivalent average population of the same cities was 116,000 in 1890 and by 1910 it had increased to 180,800. The average annual rate of growth in the cities that are the subject of this research was some 3 per cent during 1880—1910.

When looking at the towns and cities from the standpoint of what is the development of the growth rate in different cities Table 9. shows that each type of city employed in this study has its own particular development curve. When looked at within the framework of the various stages as mentioned in chapter 2. i.e. those of take-off, of accelerating growth and of slackening growth, the position of different cities seems as following:

The growth of textile cities had begun already in the beginning of the 19th century and during the research period it seems to be clearly slowing down (see Table 9.). One can therefore conclude that from the development curve of the textile cities included in this research the years between 1880 and 1910 form part of the stage of slackening growth. The rate of growth is slowing down most clearly in Mulhouse and in Augsburg but in Barmen, Crefeld, Elberfeld and Aachen also the rate of growth remained under 100 per cent during the period 1880—1910. From the very beginning the textile industry tended to develop either in rural areas or in less traditional urban centres.⁸

7. Hans Herzfeld and Gerd Heinrich (eds.), *Berlin und die Provinz Brandenburg im 19. und 20. Jahrhundert*, Veröffentlichungen der Historischen Kommission zu Berlin, Bd. 25, Berlin 1968.

8. See for example Lee 1978, pp. 280—281; Reulecke 1985, p. 28.

Table 9.

The percentage growth of population in different groups of German cities per decade.

Group of Cities	Growth 1871-1880 per cent	Growth 1880-1890 per cent	Growth 1890-1900 per cent	Growth 1900-1910 per cent	Growth 1871-1910 per cent
Commercial Cities (Altona, Bremen Cologne, Frankfurt a.M., Hamburg, Leipzig, Lübeck)	37.2	50.9	34.7	31.7	268.0
Administrative Cities (Berlin, Breslau, Brunswick, Cassel, Dresden, Hanover, Karlsruhe, Königsberg, Magdeburg, Munich, Strasbourg, Stuttgart)	29.2	36.6	30.6	28.2	193.4
Metal Industry Cities (Chemnitz, Dortmund, Düsseldorf, Essen, Mannheim, Nuremberg)	32.0	43.6	61.4	61.7	380.5
Textile Industry Cities (Aachen, Augsburg, Barmen, Crefeld, Elberfeld, Mulhouse)	23.9	27.2	18.8	14.3	113.4
Garrison Cities (Kiel, Mainz, Metz, Potsdam)	16.9	25.3	20.2	37.2	187.8
Regional Centres (Danzig, Erfurt, Frankfurt a.O., Görlitz, Halle, Posen, Stettin, Wiesbaden, Würzburg)	24.6	22.4	37.6	18.7	150.9
All Cities on average	28.1	24.6	34.4	30.3	210.7

Source: Calculated on the basis of Appendix IV.

The administrative and commercial cities have a rather similar pattern of growth. In both groups the peak of growth was reached on average sometime between 1880 and 1890 and in the early years of the century the majority of these cities had been gradually reaching the stage of slackening growth.

The metal industry cities are the only group where the growth rate is accelerating during the whole period of this research, and indeed, the fastest growth period in their development curve occurs between 1900 and 1910 (see Table 9.). This group includes cities like Essen and Dortmund which developed into large cities at a very fast rate. Some of the cities which have been classified as metal industry cities are in fact old historical towns which become industrialized relatively late, like Nuremberg⁹ or multidimensional cities like Düsseldorf. The decisive factor in the development of the industrial cities was the construction of railways which not only made an expanding internal migration possible but also provided a way of maintaining and servicing large cities and of transporting raw materials and commercial goods on a large scale. *The garrison cities* on the other hand were able to gain only to a lesser extent from this migration and therefore their growth rates obviously remained low the only exception being the rapidly growing Kiel.

So far as *the regional centres* were concerned many cities particularly in the East had been growing rapidly since the mid 19th century due either to internal migration from neighbouring areas or to their favourable location in relation to railways. So for example the impact of the railway system is a most useful factor for explaining the differences in growth rate between Stettin and its sister cities.¹⁰ The growth of the regional centres follows most closely the pattern of population developments so that the peak of their growth coincides with the culmination of the population growth in 1890—1900. After that period the rate of growth in these cities begins to slow down, due partly to the general slowing down of population growth and partly perhaps to the one-sided industrial structure of these cities with hardly any manufacturing industry at all. The group of regional centres, like for example Danzig, Erfurt,

9. Bosl 1983, pp. 5—11, 18.

10. Lee 1978, p. 281.

Frankfurt an der Oder, Görlitz, Halle, Posen, Stettin, Wiesbaden and Würzburg, is also a very heterogenous one and the differences in the growth patterns between for example Wiesbaden, Stettin, Halle and Posen are great when compared with the growth patterns of Danzig and Frankfurt an der Oder (see Appendix IV).

From the above it can be concluded that each type of city had its distinctive growth profile. The growth of the textile cities had accompanied industrialization at the beginning of the 19th century and by the turn of the century the speed of their growth had slowed down. The peak of the growth of administrative and commercial cities had also been passed by that time. Only the growth of metal cities continued at an accelerating speed. This provides us with a good starting point for an explanation of the growth of services.

Growth of British towns

In England and Wales on the other hand the urbanization process was fastest during industrialization in the first half of and in the mid 19th century when more than half the country's population was already living in towns and cities with more than 2,000 inhabitants. The growth of the largest towns continued also during the second half of the 19th century and the early years of the 20th century so that while in 1891 31.9 per cent of the total population was living in cities with more than 100,000 inhabitants the respective figure for 1911 had risen to 37 per cent.¹¹

In England and Wales the excess of births over deaths occurred at the same rate both in rural areas and in towns and cities in the 19th century. The mortality rates on the other hand were much higher in cities than in the country.¹² Therefore the growth of the English towns, like that of the

11. Census of England and Wales 1911, Vol. 1, from p. XVI —; Horst Matzerath Grundstrukturen städtischer Bevölkerungsentwicklung in Mitteleuropa im 19. Jahrhundert, in: Wilhelm Rausch (ed.), Die Städte Mitteleuropas im 19. Jahrhundert, Linz 1983, pp. 25—46; Robson 1973, p. 67.

12. Weber 1899, pp. 243—244.

Table 10.

The growth of population in different British cities 1881—1911.

growth rate below 50 per cent		growth rate over 50 per cent	
Leeds	44.3	Cardiff	119.3
Edinburgh	35.9	Manchester	109.4
Liverpool	34.9	Belfast	86.1
Glasgow	33.6	Newcastle	84.1
Birmingham	31.2	Swansea	74.2
Dundee	17.9	Sheffield	59.6
		Aberdeen	56.2

Source: Calculated on the basis of Mitchell, B. R. and Deane, P.: Abstract of British Historical Statistics, pp. 24—27.

German towns later, can be explained very much by internal migration. Not only was it migration from the country to the towns but also from the smaller towns to large cities. As a result the number of migrants among the town-dwellers varied in the largest cities from 15 per cent to 49 per cent of the total population.¹³

The growth of the large cities slowed down clearly at the beginning of the 20th century even if it is not yet possible to speak of any kind of stagnation in the increase of population during the period this study is covering (see Appendix V). From 1881 to 1911 the growth was greatest in Cardiff (119.3 per cent) and in Manchester (109.4 per cent). Table 10. demonstrates how the growth of largest cities is slowing down during the research period.

Urban growth: some aspects on research

The phenomenon of urban growth has created a wealth of research literature and among the most popular aspects with

13. Golda H. Golden, *Urbanization and Cities*, Lexington Mass, 1981. pp. 237—239.

scholars since the beginning of this century have been for example the age and occupational structures among the urban population, as well as its mobility and agglomeration. Nevertheless one of the most international in its approach to the urbanization is still the classic work *The Growth of Cities* by Adna Ferrin Weber, which was published in 1899. At the turn of the century the growth and development of population in the German cities were studied by Brückner¹⁴, Hasse¹⁵, Schott and Schmidt¹⁶ as well as Reichl¹⁷. Attention was then paid among other things to the agglomeration of population in German cities as well as to the relationship between the working and living areas and the spreading of the networks of suburbs.

Discussions on the criteria of urbanization were also included in the programmes of many conferences of statistical officers such as in the Hague — which were held at the turn of the century. The research by the well known statistician Siegmund Schott, for example, is a result of the work of the conference of the German statistical officers, which was held in Altona. There it was decided to measure the agglomeration and the density of population in different large cities within ten kilometres radius and Schott himself adjusted this data by measuring the density of population both within a 0—5 kilometres and within a 5—10 kilometres radius. It is claimed that by doing this adjustment Schott consciously tried to dissociate himself from the oversimple dichotomy countryside-city and he is said also to have transformed the administrative concept of city to an economic one.¹⁸ Reichl continued Schott's research further, but he added to it a dynamic geographic approach which included also cultural and economic aspects. Reichl emphasized the influence of the industrialization of towns on their growth and he analyzed the attraction of cities mentioning also services like those serving trade.¹⁹

14. Brückner 1890, pp. 135—184.

15. E. Hasse, *Die Intensität der großstädtischen Menschenanhäufungen*, Allgemeines Statistisches Archiv, Jg. 1891/1892.

16. Schott 1912; Hermann Schmidt, *Citybildung und Bevölkerungsverteilung in Großstädten*, Munich 1909.

17. Hans Reichl, *Die Agglomeration der deutschen Großstädte (1910 bis 1925)*, Allgemeines Statistisches Archiv, Band XVIII, 1929.

18. Schott 1912, pp. 6—9, Tabellen II—VIII, 97—123.

19. Reichl 1929, pp. 37—81.

When attraction of cities became a more interesting topic to scholars services were soon included in discussions about the reasons behind that attraction. Similarly communications became a research topic because of their relevance to the density of housing and working places.²⁰ These were in fact some of the main issues concerning the central functions of cities.

The latest research has been particularly interested in the nature of the growth of cities and differences occurring in various parts of the country.²¹

The excess of births over deaths, creating a massive surplus of population, is now considered to be the main variable for the growth in towns and cities. According to Matzerath urban development in Prussia correlates clearly with the trends occurring in population developments and so for example urbanization is fastest in times when the increase in population is also greatest. The culmination period for both these phenomena occurred during 1871—1905.²² The growth of population had started earlier, however. Especially in eastern Prussia the rural population increased rapidly from the early 19th century onwards and after the 1840's population growth began to have a significant impact in towns and cities.

The construction of a railway system was the necessary precondition for the concentration of towns and cities. As a result the industrial areas in Upper Silesia, Saxony, Berlin/Brandenburg and the Lower Rhineland as well as in the Ruhr and the Saar, all of which Reulecke labels 'Pionierregionen' (pioneer regions)²³, began to grow and the mobility of population increased considerably. In the western industrial areas which had gained many working people from the eastern parts of Prussia the population tended to settle down and start

20. Friedrich Zahn, *Die Volkszählung 1900 und die Großstadtfrage*, *Jahrbücher für Nationalökonomie und Statistik* 1903, p. 191; Walther Klose, *Die räumliche Verteilung und Dichtigkeit der Bevölkerung*, in: Friedrich Zahn (ed.), *Die Statistik in Deutschland nach dem heutigen Stand*, Band I, Munich and Berlin 1911, pp. 236—256.

21. Robson 1973, pp. 37—41, 45—46; Matzerath 1985, pp. 252—253; Lee 1978, pp. 279—293.

22. Matzerath 1985, *Abbildungen* 7—8, pp. 374—375.

23. Reulecke 1985, p. 28.

families. In the cities of the eastern parts of the country the workers on the other hand showed far less signs of stability.²⁴

Migration very much depended on current economic conditions. Internal migration tended to occur from east to west, being very considerable from East-Prussia, West-Prussia and Posen while the provinces of Rhineland and Westphalia as well as Saxony and the Berlin region were the most notable net immigration areas. The actual mobility of the population was much higher, however, because this trend coincided with the culmination period of emigration as well.

A good indicator of the scope of mobility is the fact that during the culmination period of industrialization in 1881—1910 the numbers of migrants increased by 50—60 per cent whereas the proportion of the whole German population living in the large cities increased only by 14 per cent during the same period. In practice this meant that every year the cities received new migrants to the tune of 1/3 or 1/4 of their entire population.²⁵ Many migrants moved on, however, so that for example in Frankfurt am Main of the annual 12,000 immigrants in 1891, on average, one in six left the city within a month. In research literature this trend has been called a 'nomad phenomenon'.²⁶ The migration was, however, in eastern Prussia, the only outlet for the increasing population pressures and it effected equally all groups of people. The importance of variables of attraction, pull factors, was nevertheless greater the higher the educational background of the prospective migrants. Scholars have started to employ the term 'Chancenwanderung', migration for prospects, and indeed, it is essential to see the internal mobility also as an expression of a drive for upward social mobility.²⁷

During the heyday of industrialization the notion of urbanization also meant the territorial growth of towns and

24. Matzerath 1985, pp. 9—10; Peter Marschalk, *Bevölkerungsgeschichte Deutschlands im 19. und 20. Jahrhundert*, Frankfurt am Main 1984, pp. 45—52.

25. Dieter Langewiesche, *Wanderungsbewegungen in der Hochindustrialisierungsperiode. Regionale, interstädtische und innerstädtische Mobilität in Deutschland 1880—1914*, in: *Vierteljahrsschrift für Sozial- und Wirtschaftsgeschichte*, Bd. 64, Heft 1, 1977, pp. 6—7, Tabelle 1, p. 7.

26. Reulecke 1985, pp. 74—75.

27. Langewiesche 1977, pp. 34—35; Köllmann 1974, pp. 130, 141.

cities. Industry spread its plants and estates along railways and main traffic routes. Also population settlements expanded over the city boundaries. Many suburbs, however, remained without any infrastructural services for a long time posing a problem to decision-makers who faced a dilemma. On the one hand it was desirable to allocate special areas for industrial and entrepreneurial use and on the other hand it was feared that the suburban workers could and would change the political colour of the cities and also increase the burden of municipal expenses. Many workers for their part were frightened of running into debts in case their living areas were annexed by the city itself.²⁸

So far as the city area was concerned the real urbanization took place only after all territorial incorporations, which were important preconditions for the growth of cities, had been carried out. This development was encouraged by the construction of tramway systems serving short-distance and local traffic. In Imperial Germany the period from 1885 to 1900 was also full of activity in this respect. The area of the largest cities doubled between 1850 and 1910 and it is calculated that some 19 per cent of the total population increase in towns was actually due to incorporations. Between 1880 and 1910 these totalled 188 of which 133 were carried out by the 48 largest cities, 46 incorporations benefited towns and cities with 50,000—100,000 inhabitants and a mere 9 involved cities of other size.²⁹

Internal migration had an inevitable impact also on the population structure of the cities. So for example the large administrative and commercial cities, e.g. Berlin, Munich, Hanover, Hamburg and Frankfurt am Main, differed greatly from 'young' industrial cities like Essen or Dortmund so far as the age structure of the population was concerned. While the former had a population some 70 per cent of whom were of working age the proportion of those below school age or over 60 years were relatively small (25 per cent and 5 per cent

28. Reulecke 1985, p. 80.

29. Reulecke 1985, pp. 81—82; Christian Engeli, Siedlungsstruktur und Verwaltungsgrenzen der Stadt im Verstädterungsprozeß, in: *Zeitschrift für Stadtgeschichte, Stadtsoziologie und Denkmalpflege*, 4, 1977, pp. 288—307.

respectively), in cities like Dortmund and Essen the proportion of inhabitants younger than 15 years of age was some 38—43 per cent of the total population. Indeed, at the beginning of this century it was a common phenomenon to speak about the urban population becoming younger in newly industrialized cities.³⁰

30. Laux 1983, pp. 65—93; Reulecke 1985, pp. 76—77.

8. Municipal Administration

Among other factors, the development of services required effective administration. German municipal administration differed from English municipal government in that it was more centralized and had continuity.

In Britain the Municipal Corporation Acts of 1835 and 1882 and the Local Government Act of 1888 stipulated that the responsibilities of borough governments in England and Wales were determined more by parliamentary statutes than historical conventions, common law or local charter privileges. The Local Government Act placed county administration on a representative basis, that of County Boroughs and County Councils. The Local Government Board intended to accept only ten cities as County Boroughs (all of over 150,000 inhabitants), namely Liverpool, Birmingham, Manchester, Leeds, Sheffield, Bristol, Bradford, Nottingham, Hull and Newcastle. Hence, a population of 150,000 was initially proposed as the basis for other boroughs to apply in the future for county borough status. Later when many more towns qualified as County Boroughs (81 by 1914), on lowered criteria, they were to impair county government by narrowing its fiscal base.¹

This new category of County Borough had powers which were largely equal to but independent of the County Councils. The rest — ordinary Municipal Boroughs and Urban Districts were in various aspects of their administration, such as public roads, hospitals and the police, subject to the jurisdiction of the County Council and liable for assessment in county rates.

1. William Robson, *The Development of Local Government*, 3rd rev. ed., London 1954, pp. 235—237; Herman Finer, *English Local Government*, rev. ed., London 1945; M. P. Barber, *Local Government*, London 1967, p. 21; E. L. Hasluck, *Local Government in England*, Cambridge 1936, pp. 232—296.

Most services entailed their own administrative areas, for example water supply, elementary education and secondary education all had their own areas of administration in the area of the County.²

In the English and Welsh towns the Mayor was elected from among the councillors usually for a short period and he did not enjoy the same kind of power as his counterparts in Germany where municipal government was headed by a longterm Burgomaster, who was a trained professional civil servant.³

Both the Burgomaster and the members of the Executive in German towns were elected as a rule for some years (often twelve), but on re-election a Burgomaster could be elected for life.⁴ The method of election varied from one State to another. In the eastern provinces and in Westphalia Burgomasters were elected, like members of the Magistracy, for twelve years and later (after 1856) it was also possible to elect them for life, as was the case in Saxony. On the other hand, in Alsace-Lorraine an honorary Burgomaster was elected for six years or, if he was paid a salary, for a longer term. In Bavaria and in Baden the term of a Burgomaster was shorter, varying from six to nine years.⁵

Dawson describes the powers exercised by Burgomasters as follows:

"Although the Mayor of a German town is far from being a dictator, his powers in municipal administration are at least comparable with those of a constitutional monarch in the wider field of national government. As the head of the Executive he directs the proceedings of that body, allots to its members their duties, and requires from them an account of their stewardship. He is, indeed, at once

2. Robson 1954, pp. 232—238.

3. The mayoralty is conferred as an honor. The re-election of mayors was more usual in the smaller than in the larger cities. Exceptions from this rule were f.ex. Bristol and Birmingham, Albert Shaw, *Municipal Government in Great Britain*, New York 1895, p. 59. See also: Hennock 1973, pp. 299—300.

4. William Harbutt Dawson, *German Municipal Government*, in: *The Local Government Review*, No 1, Vol 1, Nov 1909, p. 17.

5. A. Riess, *Bürgermeister*, in: *Handwörterbuch der Kommunalwissenschaften*, Bd. I, Jena 1918, pp. 476—481.

the centre and summary of the administrative life of the town. Nothing can be done without him; he is elected by the municipal body, but in many ways he is independent of it. He directs policy, initiates measures, and helps forward or discourages the measures of others according to his wisdom. He represents the town in all public capacities and official relationships. He is its Prime Minister, its Home Secretary and its Foreign Minister all in one.”⁶

The administration of the Scottish towns was close to that of German towns and cities. For this reason their Provosts could participate effectively in the planning of services although he was elected in the same way as an English Mayor.⁷

Town government in Germany was regulated by what are known as *Städteordnungen* or Municipal Ordinances and with the exception of Bavaria the States generally followed Ordinances which had been in operation in Prussia since the Stein Hardenberg reforms. The Prussian Municipal Ordinances of 1831 and 1856 were not so different from the English Municipal Corporations Act of 1835. Both provided towns with a council of unpaid, part-time representatives elected by the tax paying citizens.

The municipalities were, with the exception of Württemberg and certain small parts of Western Germany administered by two bodies — the magistracy and the Town Council. The latter elected the magistracy the members of which consisted of a mixture of salaried officials and honorary members. In Prussia both groups were chosen by the Town Council for six years if honorary and for twelve years in the first instance if salaried. The members of the magistracy represented various fields and professions.⁸

The franchise laws were not the same throughout the Empire. The franchise was, of course, direct everywhere but was nowhere universal; it was equal only in a few parts of the country and secret exclusively in Frankfurt am Main and in the

6. Dawson 1909, p. 17. According to Hennock, the Dawson's book is the best description of German municipal government at the turn of century written in English, Hennock 1973, p. 299 note 10.

7. Ian H. Adams, *The Making of Urban Scotland*, London 1978, p. 127.

8. Dawson 1909, p. 17.

diminutive state of Hohenzollern. The quality of the franchise was most seriously affected by the "three class system of franchise". The electors were divided into three groups or classes according to the direct rates levied upon them. The system gave the wealthiest citizens secure control of at least one third of the council and limited the political power of the small tax payers, however numerous, who could not elect more than one third of the councillors. In most Prussian provinces at least half of the total number of the councillors had to be houseowners themselves, and where the three-class system existed, at least half of the representatives of each class had to be houseowners.⁹ In some towns, Crefeld for example, all of the town councillors were houseowners in 1900, who could thus regulate the development of service policies.¹⁰ Houseowners and ratepayers were usually an active pressure group when discussing municipal services in Britain as well as in the Nordic capitals.¹¹

Researchers have paid attention also to the role of social clubs in the towns, and Croon, Köllmann and Hofman, for example, have analyzed their impact as a channel of influence and an important meeting ground for the local elite.¹²

It is also possible to recognize the influence of individual patrician families on the development of, for example, some old textile cities, such as Barmen, Crefeld and Aachen. By the turn of the century their influence was declining, however, and

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9. Albert Südekum, *German Local Government*, *The Municipal Journal* 15.11.1907, p. 913; Hennock 1973, p. 301.
 10. Hans Böhm, *Rechtsordnungen und Bodenpreise als Faktoren städtischer Entwicklung im Deutschen Reich zwischen 1870 und 1937*, in: Hans Jürgen Teuteberg (ed.), *Urbanisierung im 19. und 20. Jahrhundert. Historische und geographische Aspekte*, Cologne 1983, p. 217.
 11. Offer 1981, pp. 105—136; Bristow 1975, pp. 782—783; Carl V. Harris, *Political Power in Birmingham 1871—1921*, Knoxville 1977, pp. 40—52. Discussion about expences of streetcleaning: *Suomalaisen puolueen puoluekokous 28—29.12.1909*, *Suomalainen puolue*, *Suomalaisen puolueen arkisto*. K.3 Nippu 1., p. 137. (National Archives of Finland).
 12. Krabbe 1985, pp. 136—139; Wolfgang Hofmann, *Die Bielefelder Stadtverordneten, Ein Beitrag zur bürgerlichen Selbstverwaltung und sozialen Wandel 1850—1914*, Lübeck and Hamburg 1964, pp. 40—45; Hennock 1973, p. 304; Wolfgang Köllmann, *Sozialgeschichte der Stadt Barmen im 19. Jahrhundert*, Tübingen 1960.

before long their place was taken by directors of big companies, wholesale merchants and journalists.¹³

The advantages of a centralized administration could be seen in the German towns when it came to questions of land purchase policy. In this way the location of industry could be controlled and polluting industries could be given sites far from built-up areas. The regional policies of Frankfurt am Main are mentioned as an example of the above.

The construction and paving of streets in particular forced the city to negotiate with the neighbouring communes. Oberbürgermeister Franz Adickes of Altona, later Oberbürgermeister of Frankfurt am Main, was a particularly clever negotiator in these matters. He succeeded for example in having the town of Ottensen joined to Altona and as Burgomaster of Frankfurt he was able to achieve considerable mergers of areas as well as municipalizing the electricity works and building the electric tramway system. He was also able to fulfil his promise to produce gas and electricity for the annexed areas. By 1910 the whole administrative district of Frankfurt am Main had been joined to the city of Frankfurt.¹⁴

Under optimum conditions area mergers could serve the needs of both parties. Mergers of towns were speeded up in those cases where the city undertook to reduce the rates and tariffs of its suburban enterprises also provided the mergers went through.¹⁵

As shown in the following, albeit incomplete Table 11. many of the German cities increased their ownership of land properties during the period of this study. Some of them even raised loans for this purpose. Table 11. reflects, for example, the policy pursued by the city of Frankfurt am Main in this

13. Helmuth Croon, *Die gesellschaftlichen Auswirkungen des Gemeindegewahlrechts in den Gemeinden und Kreisen des Rheinlands und Westfalens im 19. Jahrhundert*, Cologne and Opladen 1960, pp. 38—39.

14. Wolfgang Hofmann, *Oberbürgermeister und Stadterweiterungen*, in: Helmuth Croon, Wolfgang Hofmann and Georg Christoph von Unruh (eds.), *Kommunale Selbstverwaltung im Zeitalter der Industrialisierung*. Schriftenreihe des Vereins für Kommunalwissenschaften, Bd. 33, Stuttgart 1971, pp. 69—74.

15. Hasse, *Eingemeindung*, in: *Handwörterbuch der Kommunalwissenschaften*, Bd I, Jena 1918, pp. 570—578; See also Otto Most, *Die Gemeindebetriebe der Stadt Düsseldorf*, in: *Schriften des Vereins für Socialpolitik*, Bd. 129.2, Leipzig 1909.

Table 11.

The landed property of German cities as a percentage of their total area. Land (building sites etc.) owned by the city or by foundations governed by the city as a percentage of the total city area excluding roads, streets, railways, water areas and fortifications.

City ¹	The percentage of land owned by the city in 1900	The percentage of land owned by the city in 1912
Aachen	45.1	..
Altona	14.6	30.5
Augsburg	51.6	39.9
Barmen	..	21.5
Berlin	..	15.9
Breslau	26.8	32.2
Brunswick	..	8.5
Cassel	22.6	12.7
Chemnitz	19.7	27.1
Cologne	16.9	34.6
Crefeld	4.6	15.4
Danzig	14.4	14.3
Dortmund	16.5	23.4
Düsseldorf	..	21.1
Elberfeld	..	14.9
Erfurt	8.9	17.6
Essen	..	16.4
Frankf.a.M.	58.4	52.0
Frankf.a.O.	..	23.6
Görlitz	10.9	32.1
Halle	28.7	24.3
Hamburg	45.4	..
Hanover	43.4	27.3
Karlsruhe	16.1	40.7
Königsberg	..	23.0
Leipzig	..	33.1
Mainz	20.2	..
Mannheim	29.8	46.0
Metz	..	6.4
Mulhouse	..	14.9
Munich	20.5	20.8
Nuremberg	9.4	18.0
Posen	32.9	13.9
Potsdam	6.8	10.9
Stettin	..	61.9
Strasbourg	7.6	41.5
Stuttgart	..	28.8
Wiesbaden	..	37.8

Source: Statistisches Jahrbuch Deutscher Städte, 11. Jahrgang, pp. 6; 21. Jahrgang, pp. 6—7.

¹ Data not available for Bremen, Dresden, Lübeck, Magdeburg, Würzburg for the years 1900 and 1912.

matter, but Stettin, Mannheim, Strasbourg, Karlsruhe and Augsburg also owned about 40 per cent of the total land area of the city while the cities of Cologne, Wiesbaden, Leipzig, Breslau and Altona were all to the forefront in this respect. Many of these such as Mannheim, claimed to pursue active policies of industrialization or had in other ways become noted for their active policies in establishing and building municipal enterprises.

In connection with area incorporations various tax reliefs for the inhabitants of merged areas, were quite common. Thus in 1910, for example, Cologne, Kiel, Flensburg, Hamburg, Magdeburg, Spandau, Mülheim a.d. Ruhr and Frankfurt am Main all promised considerable tax reliefs to such people, which in the case of Frankfurt am Main meant an exemption for 30 years.¹⁶

Town planning and land policies were very much a function of the energy of individual Burgomasters. Wolfgang Hofmann mentions, in addition to Franz Adickes of Altona and Frankfurt am Main, certain other names: Fr. Wilhelm Becker (Düsseldorf and Cologne), Zweigert (Essen), Selke (Königsberg), Johannes Miquel (Osnabrück, Frankfurt am Main) and Arthur Hobrecht (Berlin, Breslau).¹⁷ It is also worth mentioning Richard Robert Rive, Burgomaster of Halle and the long serving Burgomaster of Strasbourg, Otto Back (1873—1880 and 1887—1906) as well as his successor in Strasbourg, Rudolf Schwander (1906—1917), all of whom were renowned for their industriousness and activity in developing services in their cities. Schwander is particularly praised for sustaining co-operation between the city and private enterprises, the best example of which was the Strasbourg Electricity Works, a jointly owned company (*Gemischt-wirtschaftliche Unternehmung*).¹⁸ The city of Stettin also enjoyed the services of

16. Hasse 1918, p. 575.

17. Hofmann 1971, pp. 59—85.

18. Helmuth Croon, *Aufgaben deutscher Städte im ersten Drittel des 20. Jahrhunderts*, in: Wilhelm Rausch (ed.), *Die Städte Mitteleuropas im 20. Jahrhundert*, Linz 1984 p. 41; Kurt Blaum, *Die wirtschaftliche Betätigung der grösseren Städte*, in: *Die wirtschaftliche Entwicklung Elsass-Lothringens 1871 bis 1918*, Frankfurt am Main 1931; Bogdan Dopierla, *Die Rolle des Oberbürgermeisters und des Berufsbeamtentums*, in: Wilhelm Rausch (ed.), *Die Städte Mitteleuropas im 20. Jahrhundert*, Linz 1984, pp. 113—126.

longstanding Burgomasters, such as Herman Hacken, who was in the office for 29 years (1872—1907) and his successor Friedrich Ackermann whose term expanded over 24 years (1907—1931). Of these heads of cities especially Friedrich Wilhelm Becker is especially well-known for his achievements in the administration of Düsseldorf. He developed an administrative model where the various sectors each had their own departments (taxes, etc.), but where for reasons of rationality the municipal enterprises were under joint administration.

With the support of many of the above mentioned Burgomasters Adickes tried as early as 1892 to have legislation enacted that would make the sale of land compulsory, but he was not, however, successful. This would have given the municipality the right to enforce the purchase of land for new construction in municipalities of over 100 inhabitants. The Lex Adickes, passed more than ten years later, applied only to the city of Frankfurt.¹⁹ However, similar laws were passed applying to other cities. The Burgomasters were in close co-operation, but their reference group extended beyond national boundaries, as the career of Franz Adickes demonstrates. The power of Oberbürgermeister was based not only on co-ordinating the affairs of the town but also on the fact that the Burgomasters could sit in Parliament (Preussische Landestage).²⁰ This was not liked by the inhabitants of the smaller communes, because they could not participate directly in passing laws beneficial to the cities.

Foreign observers admired the ability of the German towns to take risks, a quality that owed much to the Burgomasters. Howe writes of the policy adopted by Düsseldorf, his model city, as follows:

"Consequently the city says even this considerable increase of municipal liabilities is nothing else than a sign and an attendant phenomenon of a highly prosperous town, the administration of which is constantly pursuing their aims."²¹

19. Hofmann 1971, pp. 59—85.

20. Zweckverband rheinisch-westfälischer Gemeinden, Städte-Zeitung 17.9.1909, p. 700.

21. Howe 1913, p. 63.



Figure 7.

The Association of Finnish Cities was founded in 1912 in Helsinki. Municipal officials in Finland were actively interested in developments on the Continent, although the country was an autonomous Grand Duchy of the Russian Empire. E.g. the city of Helsinki provided travel grants for specialists in various fields for foreign study tours often lasting several months. (Archives of the Association of Finnish Cities)

Cities also executed measures related to industrialization policies, for example selling electricity at a cheaper rate to small industrial enterprises and workshops. Craftsmen in particular were assisted also by the provision of tools and raw materials. In order to bring them into contact with progressive ideas Institute for the Advancement of Industry was created for example in Cologne, and it was assisted by Rhine province, States and several Chambers of Commerce. The Cologne Institute comprised a technical college for young men, various training workshops, exhibition halls, testing rooms for machinery and materials as well as an advice and information bureau and a library.²²

22. Dawson 1914, pp. 242—243.

Another example of the expansion of municipal tasks, as well as its resultant impact in the numbers of municipal employees, is provided by the city of Düsseldorf. Whereas in 1851 the concerns of the city had been taken care of by one Burgomaster and a mere 50 officials in 1908 the city employed some 4,800 people including those working for municipal enterprises. At that time the city clearly was the biggest individual employer in the whole of the Düsseldorf area.²³

The success of development policies was not, however, due only to the cities' willingness to take risks but also to their civic pride, to which Howe so often refers to.²⁴ In an article in the *Städte-Zeitung* in 1906 Otto Hähnel claimed that in every city of over 100,000 inhabitants local pride had risen considerably, as if a victory had been achieved, when the population reached that number.²⁵ Moreover the towns not only competed with each other but also on the international level and the pressure to remain on a par with other towns — especially the neighbouring ones — in the production of services was clearly evident in the written material at the turn of the century. Comparative statistics, tables and drawings gave cause for concern if one's own city was falling behind. This was especially seen in connection with municipalization policies.²⁶ In his article *The development of Municipal Trading in the nineteenth century* Malcolm Falkus notes that:

"... civil consciousness provided a dual spur to municipalization. Dissatisfaction with existing amenities and unfavourable comparisons with other towns motivated many town councils to run their own public utilities."²⁷

The intensifying of competition between cities can be observed in the speed with which cities established their statistical offices. In Germany these bureaux quickly emerged in the large cities in the 1860's; Bremen had already got its statistical office

23. Most 1909, p. 156.

24. Howe 1915, p. 84.

25. Otto Hähnel, *Das Großstadtproblem*, *Städte-Zeitung* 25.5.1906, pp. 440—442.

26. See e.g. Otto Most, *Die Gemeindefinanzstatistik in Deutschland. Ziele, Wege, Ergebnisse*. Schriften des Vereins für Socialpolitik. Band 127.2, Leipzig 1910, p. 21.

27. Falkus 1977, pp. 134—161.

Akademie für kommunale Verwaltung in Düsseldorf

Zweck: Rechts- und wirtschaftswissenschaftliche,
sowie praktische Ausbildung für leitende Stellen
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Studienmittel: Vorlesungen, Übungen, Semi-
nare, Besichtigungen; Bibliothek und Lehrmittel-
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Studiendauer: 2 Semester.

Gesamthonorar: pro Semester 100 Mark.

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Der Studiendirektor:

Professor Dr. Ritter und Edler v. Hoffmann

Figure 8.

From 1911 onwards the municipal administration of Düsseldorf began to arrange training programmes of a year's duration for persons aiming at executive positions in municipal administration. Foreign observers saw the successful achievements of the German cities as a result of efficient administration and a civil service that identified itself with the city as well as a positive municipal spirit. In Germany a civil service position in a municipality became a valued career option. (Advertisement from the book: Verhandlungen des ersten Kongresses für Städtewesen Düsseldorf 1912, Bd. 2, Düsseldorf 1913)

by 1861 and its example was followed by other old Hanseatic cities, such as Hamburg in 1866, as well as other large cities. The publications produced by these offices served the administrative decision-makers in two ways: firstly they demonstrated the developments which had taken place and secondly they could provide some indication of future trends. Further needs for statistical information were also created by rapid population growth and the incorporation of surrounding areas into the city as well as by the expansion of the municipal sector in general. Concern for the organization of education and training, health care or food supplies forced the municipal decision-makers into comparisons with other towns and cities in the same region and even in the rest of the Empire. In 1879 the heads of the statistical offices of the German towns and cities held their first joint conference, where for example Altona, Berlin, Breslau, Chemnitz, Dresden, Hamburg, Leipzig, Lübeck and Munich were represented.²⁸

The full picture of German municipal government cannot, however, be complete without some mention also of the very high professional standards of the officials, achieved by training them in special administration and civil service colleges (the Akademie für Kommunale Verwaltung in Düsseldorf, for example). These services aroused a particular interest among foreign visitors, as will be shown below.²⁹

When comparing the government of German and British towns and cities at the turn of the century, German cities were certainly superior in their efficiency. In his studies Peter Hennock has suggested that the English administrative model, based on decision-making by elected members meant that councillors and aldermen were familiar with life 'in the world of mass politics':

"... those who were elected whatever their social and economic position, knew how to live in the world of democratic parties and to think in categories that could unite men of different social and economic experiences."³⁰

28. Landsberg, Statistik, in: Handwörterbuch der Kommunalwissenschaften, Bd. IV, Jena 1924, pp. 69—80.

29. E.g. Howe 1913, pp. 53—67.

30. Hennock 1973, pp. 306—307.

9. The Economic Basis for Production of Services in Cities

The economic basis on which the local authorities produced services both in Germany and in Great Britain consisted mainly of central government grants, local taxation funds and the franchises and fees collected from the users of particular forms of services. In addition the municipalities got commercial returns from their enterprises, rents and invested capital.

So far as services in Great Britain were concerned, they could be divided into two main categories: 1) special services provided by the local authorities by their own choice and 2) services which had a national character in that the municipalities were compelled by the national government to provide them. Some of the activities in both groups might be wholly or partly financed by national government, but those grants might be either automatic or dependent on legislation or the decision of respective ministers.

Services could be divided into two main classes, namely 'municipal taxation services' and 'municipal revenue services'. Municipal taxation services were those provided entirely out of taxation and municipal revenue services were those which were provided wholly or partially from revenue derived from those who used the services. The most important municipal taxation service in Britain was the provision of public health care. In no part of the municipal service did development take place at a greater rate than in that of public health. The provision of public baths and wash-houses was a municipal revenue service and was important from the public health point

of view. Inspection of food and drugs safeguarded the wholesomeness of the food supply.¹

It is estimated that in Germany approximately half of the taxation revenue was gained from income tax, but the German states were able to collect a great variety of other types of taxes and rates too. They exacted taxes for example on business, transfer of land, dogs and unearned increment of land values — this arrangement was greatly admired abroad.²

The incomes of the German cities can be divided into their own income (municipal rates = *Gebühr, Beiträge*), aid from the State and income from taxes. For example, there were special fees for using particular services (School tax = *Schulgeld*, Canal dues = *Kanalbetriebsgebühr*, Waste disposal fees = *Müllabfuhrgebühren* and Street cleansing fees = *Straßenreinigungsgebühren*). It was also possible to collect extra revenue for improving services, such as pavings for streets or establishing a park.³ For example, in Munich there was an extra revenue levied for paving the streets (*Pflasterzoll*). This amounted to 1,490,000 marks in 1911—1912 while the tax received by the city was 23,380,000 marks. In Berlin the dog tax amounted to about 1 per cent of all municipal revenue in 1911—1912.⁴

According to Otto Most the expenditure of the German cities can be divided like in Great Britain, into statutory and voluntary costs, so that under the same heading, for example, education, there are costs stipulated in law and costs which cities have volunteered to meet. In addition the cities have extraordinary expenditure.

In 1895 former Burgomaster Johannes Miquel served as Minister of Finance bringing forward a new law on municipal taxation. According to this law, the main part of city expenditure was to be covered by income from municipal property, fees which are tax-like in nature, but in addition, secondarily, the city could levy indirect taxes and a municipal income tax. The underlying idea was that of getting services to

1. Comparative Municipal Statistics 1912—1913 Vol. 1, p. XVII, XXII.

2. Howe 1915, p. 338.

3. See e.g. Krabbe, 1985, pp. 324—333.

4. *Gemeindesteuern und Gebühren*, Stat. Jb. Deutscher Städte, Jg. 19, pp. 306—307.

pay for themselves. In practice direct taxes formed the basis of municipal revenue. In Prussia a total of 17 different taxes were levied in the early 1900's.

In Germany the whole urbanization process and the growth in the importance of cities took place so quickly that before very long the inadequacy of the law concerning the Prussian cities became obvious. This law which dated from the year 1808 and had been the model for the legislation governing other cities, now no longer met the changed circumstances in those cities, for their tasks had changed far faster than the existing law. Also the German states varied from each other; depending on which state was involved, for example, policing was a matter either for the state or for the city. There were differences also in the ways of collecting taxes: in Prussia and in the Saxon cities the state tax was collected simultaneously with the municipal taxes (by the city treasurers) but in Bavaria, Baden, Hesse and Alsace-Lorraine the state taxes were directly collected by the state treasuries.⁵

The cities were also dependent on acceptance by the state of their levels of borrowing. They also had to fight with the state about their taxation revenue, and they began to object vigorously to the right of the state to exact taxes on the inhabitants of the cities; for example in the Bavarian State Conference of 24.—25.6.1907 a motion was unanimously accepted demanding that the state should not take all the natural sources of taxation for its own use and leave only the remaining taxation laws to the municipalities. According to the motion the principle must be that the healthy municipal economy is as important to the state as is a healthy state economy.⁶

It is also claimed that the legislation of the Prussian state not only ignored the importance of the cities but even tried to restrict the functions of the cities (for example the law on the status of district doctors of 16.9.1899 or the law on the maintenance of elementary schools of 27.8.1906).⁷

5. Reichs- und Staatssteuern, Stat. Jb. Deutscher Städte, Jg. 15, pp. 467—468.

6. Rive, Die Entwicklung der preußischen Städte seit dem Erlaß der Städteordnung von 1808, Städte-Zeitung 19.11.1908, p. 104.

7. L. Schücking, Die Reform der Städteordnungen, Städte-Zeitung 19.11.1908, p. 124.

When studying the level of services and their development in the cities, the matter creating most problems is the data collected from the financial statistics, concerning the costs of different administrative branches as well as the revenue from the city enterprises and other activities, for such data tend to be inconclusive.

Problems caused for example by the fact that the revenue and expenditure accounts in the supplementary budgets are not necessarily closed at the end of the financial/calendar year and the allocated funds can also be used for the original purpose during the next financial/calendar year without a new decision by the Municipal Council.⁸

The assets and liabilities of German cities

The *Statistisches Jahrbuch Deutscher Städte* contains information on the properties and returns of the cities at the end of the calendar year 1907, 1911 and 1912, or the fiscal year 1907/08.⁹ The total combined nominal value of the enterprises, securities and shares etc. of each particular city have been included in the summaries of the tables of this handbook. It includes also the tripartite classification of assets: capital of the city in the strict sense, secondly its works and enterprises and lastly the capital of its foundations. The use of this information depends, however, first of all on how much the nominal values are to be equated with the market values of its assets.

Secondly it depends on the similarities and differences of the valuation measures, which were used in each particular city.¹⁰ One of the most useful and reliable measures to be applied to

8. Based on Jaakko Pöyhönen's analysis concerning the Economy of German towns.

9. Stat. Jb. Deutscher Städte, Jg. 18, pp. 639—676; Jg. 20, pp. 787—885; Jg. 21, pp. 791—850.

10. For example in the same year 1907 according to Passow, the city of Düsseldorf offered to the other shareholders of the Rheinische Bahngesellschaft A. G. in Düsseldorf the price of 154 per cent of their

different cities is the amount of debt for which the city has incurred liabilities. Even this measure has been criticized, for any activity, for example in developing services, did not necessarily involve an increase of indebtedness.¹¹ When launching joint enterprises with private entrepreneurs the cities normally were the guarantors of the loans. Still the raising of the loans might often reflect the city's capacity for taking risks. According to Otto Most the financial statistics are inconclusive and not capable of comparison and this applies also to the municipal financial statistics (*Gemeindefinanzen*) in the *Statistisches Jahrbuch Deutscher Städte*.

Most claims in his book *Die Gemeindefinanzzstatistik in Deutschland* that the details concerning the financial state of individual cities cannot be compared with those of others, partly because the statistics contain considerable classification differences in the same administrative branches and partly because the rubrics of the questionnaires were less than adequate: it is not always clearly specified if for example, the

market value but in the tables of the *Statistisches Jahrbuch* the shares owned by the city were quoted only at their nominal value. Similarly the city of Crefeld bought the Crefeld Strassenbahn A. G. in Crefeld — company from the Rheinisch-Westfälische Elektrizitätswerk in 1908 at "hard price" (Passow's opinion) but in the tables for 1907 the shares of that particular enterprise which Crefeld already owned were quoted at their nominal value. Analysis is based on Jaakko Pöyhönen's analysis concerning the Economy of German towns.

Passow, R., *Die gemischt-privaten und öffentlichen Unternehmungen auf dem Gebiete der Elektrizitäts- und Gasversorgung und des Strassenbahnwesens. Beiträge zur Lehre von den industriellen, Handels- und Verkehrsunternehmungen*, Heft 8. In *Verbindung mit dem Staatswissenschaftlichen Seminar der Universität Kiel* ed. R. Passow, 2 Auflage, Jena 1923, p. 117.

11. The total indebtedness of the municipalities of over 10,000 inhabitants had increased during 1881—1907:

1881	771.1 million Marks
1891	1,400.5 million Marks
1901	3,097.7 million Marks
1907	5,295.7 million Marks

Reichstagsdenkschrift zur Reichsfinanzreform (Denkschriftenbände zur Begründung des Entwurfs eines Gesetzes betreffend Änderungen im Finanzwesen). Reichstagsdrucksachen, 12. Legislaturperiode, I Session 1907/09, Nr. 1035.

gross or net income is included or if ordinary or combined ordinary and extraordinary costs are mentioned. Similarly there are uncertainties about whether information concerning only the annual budget itself or also concerning the supplementary budget is presented.

The differences between municipalities/cities are mostly due to the fact that each different state had different legislation on administrative practice. Most refers also to the national or provincial atmosphere developed over a long period. But also in addition a disguising of information can occur, especially where the economic statistics are concerned, because of fear of a neighbouring city or group of cities. Thus the competition between cities and groups of cities is considered to be a further cause of difficulty in developing satisfactory economic statistics.

In general all data about the economy of individual municipalities cannot be compared with that of others if the facts on which they are based have not been derived from a similar level of financial presentation.¹²

There were in Germany three currently used methods of setting out the municipal economy, all of them naturally derived from the municipalities' own method of accountancy: *Etat*, *Rechnung-Soll* and *Rechnung Ist*. *Etat* involves the revenue and expenditure being calculated in the normal budgeting way, *Rechnung Ist* on the other hand includes all income accruing to the city treasury during the calendar year/fiscal year as well as the outgoing moneys. *Rechnung-Soll* shows the actual revenue taken during the financial period.¹³

12. Otto Most, *Die Gemeindefinanzstatistik in Deutschland*, Schriften des Vereins für Socialpolitik, Bd. 127.2, Leipzig 1910, pp. 15—19.

13. Most gives a clear example of the differences in these accounts by presenting the following items of expenditure by the city treasury of Cologne:

	according to Etat in Marks	according to Rechnung-Soll in Marks	according to Rechnung-Ist in Marks
1905	29,898,286	42,544,039	41,323,752
1906	31,901,000	89,120,553	63,228,277
1907	36,224,400	70,915,359	63,588,947

The difference between *Etat* and *Rechnung-Ist* are great especially in items of revenue which are related to economic trends like sales tax and tax on incremental value.

Comparisons of the economy in German cities was an area on which chiefs of statistical bureaux and the participants in city meetings spent a great deal of time and labour. The tax-paying capability of the city inhabitants can be used as a kind of measure, though applying only indirectly to the general economic situation of the cities and the question of how able they were to establish municipal enterprises among other services. Statistics on Prussian towns are available for the year 1907. Table 12. shows that the number of persons liable to taxation varied greatly, from 13.20 per cent to 31.45 per cent. The number of tax-paying persons was greatest in Berlin, Düsseldorf, Frankfurt am Main, Essen and Dortmund. Wiesbaden was sixth. The smallest numbers were in the small towns of the East: Danzig, Frankfurt an der Oder, Posen and Görlitz. Table 12. can be so interpreted that tax-payers were most numerous in places with a highly educated population, greater intellectual capital or skilled workers as in Essen and Dortmund. The small numbers for the smaller towns of the East may be the result of lower incomes in comparison with the West.¹⁴

The table also shows that the supplements (Zuschlag) to the State income tax levied by the cities varied from 75 to 200 per cent. It appears that the size of this extra tax, which was usually the same as or more than the direct tax to the Prussian State remained nearly the same from 1895 to 1907 in each of the cities and its size does not permit conclusions regarding possible rises in municipal activity or its decrease, for example in relation to municipal services.¹⁵

Municipal taxation in the various cities can be observed only roughly because the aid provided by the different States varied. In Prussia the income tax formed about half of the total tax

The worst relative miscalculation concerned Wiesbaden in 1908 when 450,000 Marks were estimated in Etat to be collected as taxes on incremental value. In fact the Rechnung-Ist shows that only 89,331 Marks were collected. Most 1910, pp. 133—135.

However, the Statistisches Jahrbuch Deutscher Städte indicates correctly that the yield from this form of taxation in Wiesbaden was 89,331 Marks. Stat Jb. Deutscher Städte, Jg. 18, p. 199.

14. Silbergleit 1908, Erläuterungen, p. 243.

15. Ibid. pp. 450—451.

Table 12.

Total of State tax payers, percentage of total city population and percentage supplements to State income tax levied by the municipalities in certain Prussian towns in 1907.

Town	Persons paying State income tax		Municipal income tax (so-called supplement to State tax) as per- centage of State in- come tax in 1907
	A.Total 1907	B.Percentage of total population 1907	
Aachen	26,610	17.66	135
Altona	40,997	23.51	200 #
Barmen	37,748	23.74	200 +
Berlin	637,806	31.45	100
Breslau	87,446	17.87	136 +
Cassel	30,059	21.15	110 +
Cologne	106,734	23.12	135
Crefeld	27,199	24.75	180 x
Danzig	21,433	13.49	196 x
Dortmund	51,960	28.28	200 x
Düsseldorf	74,426	28.60	140
Elberfeld	40,718	24.79	195 x
Erfurt	26,711	25.33	143 x
Essen	67,252	28.38	200
Frankf. a.M.	99,597	28.89	73.5 to 105
Frankf. a.O.	9,243	14.41	177 x
Görlitz	14,164	16.96	120 x
Halle	37,831	21.76	142 +
Hanover	54,022	21.79	125 x
Kiel	41,709	25.48	180 +
Königsberg	30,034	13.20	200 +
Magdeburg	55,461	22.62	152 +
Posen	18,861	13.24	170 x
Potsdam	14,195	23.14	110 x
Stettin	37,217	16.23	160 +
Wiesbaden	29,554	27.97	100

Minimum yearly income liable to taxation was 900 marks. The municipalities could themselves decide to levy the so-called supplement to State tax ("Staatssteuerzuschläge") and its extent. Income less than 900 marks per annum could also be taxed.

+ persons earning over 660 marks per annum were also liable to taxation

x persons earning over 420 marks per annum were also liable to taxation

persons earning less than 420 mark per annum (t.e. all persons who had earnings) were also liable to taxation

Source: Silbergleit, Preußens Städte, Erläuterungen, p. 244, Tabellen, pp. 414—417, 432—439, 450.

Table 13.

Municipal taxation per inhabitant in marks in certain German cities in 1910

Town	Local taxburden per inhabitant
Frankf. a.M.	59.47
Wiesbaden	49.39
Elberfeld	46.95
Stuttgart	44.81
Essen	44.34
Mannheim	43.03
Cologne	42.64
Dortmund	42.41
Barmen	42.16
Berlin	41.81
Aachen	41.24
Altona	40.70
Düsseldorf	40.52
Munich	39.89
Breslau	38.56
Kiel	38.42
Metz	38.32
Königsberg	38.07
Magdeburg	38.07
Leipzig	37.85
Crefeld	36.86
Halle	36.16
Mainz	35.63
Strasbourg	35.11
Stettin	34.57
Erfurt	34.33
Hanover	33.97
Cassel	33.15
Dresden	32.92
Chemnitz	32.34
Posen	32.32
Karlsruhe	31.65
Danzig	31.42
Nuremberg	29.29
Frankf. a.O.	28.26
Potsdam	28.10
Görlitz	27.33
Brunswick	26.95
Augsburg	25.88
Würzburg	24.01

Source: Statistisches Jahrbuch Deutscher Städte, Jg. 19, pp. 316—317.

levied whereas in Bavaria, for example in Nuremberg, it was only one-fourth of all taxes. In the towns and cities of Saxony the proportion of income tax was very large, for example in 1910 in Dresden 13,690,000 marks were levied as income tax out of total taxation of 17,820,000 marks. In some areas the importance of indirect taxes was stressed, for example in Alsace¹⁶ (see Table 13.).

Table 13. shows clearly how the total taxation per inhabitant was on average greatest in the Western cities and smallest in towns of 50,000—100,000 inhabitants. This may reflect the level of income and the activity of the inhabitants. Leading the statistics on taxation are Frankfurt am Main, Wiesbaden, Stuttgart, Essen, Elberfeld, Cologne and Dortmund. The pressure to take loans was very great in the middlesized towns and cities. It was needed for establishing municipal enterprises or for purchasing them.¹⁷

The following presents loans taken out by cities for municipal enterprises. Comparable details are available on the towns and cities of Germany and Great Britain. The establishing of waterworks, gas and electrical plants and the purchase of trams required loans in many cases. Table 14. shows that loans for these purposes were often even half of the total loans of the city. The amount of loans was greatest in Edinburgh (69.2 per cent), Belfast came second and Birmingham third (65.5 per cent). The table shows that cities which had started early in the establishing of communal enterprises such as Glasgow were bound by loans which made up only 47.9 per cent of total city loans. The table can also be interpreted so that in these cities where growth was slackening other projects than municipal enterprises could also be funded. The small debt of Bristol is the result of the fact that services were provided by privately-owned companies (gas, tramways and waterworks).

Loans taken for waterworks the purchase or construction of tramlines were the main forms of loans taken for municipal enterprises. Only Aderdeen and Newcastle in addition to Bristol did not require to take loans for the construction of their waterworks (see Table 14.).

16. Stat. Jb. Deutscher Städte, Jg. 19, pp. 306—307, 318—320.

17. Im Zeitalter der Städteschulden, Städte-Zeitung 23.5.1911, pp. 546—550.

Table 14.

Debt outstanding for local government purposes (other than Poor Law) in British cities at end of the year 1912—13 as percentile proportions of total and net debt per head of population.

City	Electr. supply	Gas supply	Tramways	Water supply	Together			Net debt per head of population						Total	
								rate services			revenue producing services				
					£	s.	d.	£	s.	d.	£	s.	d.	£	d.
London	5.0	0.0	9.0	36.2	50.3	11	19	3	12	2	24	1	9		
Birmingham	8.1	8.8	9.0	39.5	65.6	8	5	8	15	6	24	1	10		
Liverpool	10.7	0.1	7.2	40.1	58.3	7	8	1	10	7	17	15	3		
Manchester	7.9	4.5	6.8	27.2	46.6	16	15	6	14	13	31	9	2		
Sheffield	8.2	0.0	9.3	40.3	57.9	9	8	10	13	—	22	9	2		
Leeds	6.2	9.0	8.1	23.9	47.4	14	18	1	13	9	28	7	1		
Bristol	7.2	0.0	0.0	0.0	7.2	20	13	5	1	12	6	22	5	11	
Newcastle	0.3	0.0	28.4	0.0	28.8	8	4	2	3	7	1	11	3		
Cardiff	5.2	0.0	14.1	29.2	48.5	10	11	11	10	—	20	12	4		
Swansea	6.1	0.0	4.3	45.1	55.6	8	13	9	10	17	8	19	11	5	
Glasgow	9.9	9.2	13.2	15.4	47.9	9	15	4	8	19	11	18	15	3	
Edinburgh	8.3	19.7	11.0	29.9	69.2	7	1	4	15	8	—	22	19	4	
Dundee	8.8	13.1	9.3	26.7	58.0	7	2	1	9	17	1	16	19	2	
Aberdeen	13.1	8.2	10.2	0.0	31.7	7	4	8	3	7	4	10	12	—	
Belfast	6.0	7.1	22.9	33.0	69.1	4	5	—	9	10	5	13	15	5	

Source: Calculated on the basis of Comparative Municipal Statistics, Vol. 1, 1912—13, pp. 136—139.

Table 15.

Debt outstanding for municipal enterprises in some German cities at end of the year 1912 as percentile proportions of total and as per head of population in marks.

Town	Debt outstanding for municipal enterprises percentage of total	Debt outstanding for municipal enterprises per head of population
Aachen	74	178
Stettin	73	212
Mannheim	69	250
Dortmund	65	251
Crefeld	65	248
Barmen	63	277
Königsberg	57	141
Frankfurt a.M.	55	341
Berlin	55	121
Breslau	55	127
Dresden	53	164
Nuremberg	52	192
Hanover	50	117
Karlsruhe	50	168
Posen	50	128
Cologne	49	201
Leipzig	49	141
Halle	48	94
Munich	47	238
Görlitz	47	103
Mainz	46	189
Metz	45	157
Elberfeld	44	157
Erfurt	44	116
Stuttgart	43	114
Danzig	43	85
Wiesbaden	43	239
Chemnitz	42	102
Strasbourg	41	183
Altona	39	150
Brunswick	37	61
Düsseldorf	34	162
Würzburg	32	97
Potsdam	31	81
Frankfurt a.O.	28	39
Augsburg	20	63
Essen	17	30
Average	47.4	154.5

Source: Calculated on the basis of Statistisches Jahrbuch Deutscher Städte, Jg. 21, pp. 642—645.

Table 15. presents borrowing by German cities for municipal enterprises. It does differentiate between the purposes of the loans but comparisons can be made with the towns and cities in the United Kingdom. In 1912 the cities of Aachen and Stettin took more loans for municipal enterprises than any city in England, Scotland, Wales or Ireland. Mannheim was in the same class as Edinburgh and Belfast. The industrial cities of Mannheim, Dortmund, Crefeld and Barmen led the statistics whereas those cities which had been active in constructing and establishing municipal enterprises prior to 1912 (e.g. Düsseldorf, Wiesbaden) had finished their tasks. It must be remembered that the tables reflect only a sectional situation and the amount of debt at that time. The data reflects mainly the cities which were in an active stage of development. Many of the first pioneer cities had solved their municipal ownership problems and could take loans for other purposes than municipal enterprises. (cf. Appendix VII).

10. Aspects of Municipal Trading at the Turn of the Century

The scope of municipal trading

At the beginning of this century the question of infrastructure and the various other services were drawn into a discussion then being carried on all over the world but particularly in Britain and in the United States, on the issue of municipal trade and municipal enterprises (Kommunale Gemeindebetriebe). By this is meant the production of an extensive range of municipal services. In his preface C. J. Fuchs, the publisher of the *Verein für Socialpolitik* series, classified the area of municipal trading as follows:

- A. Production of services and goods for the needs of the municipality itself (Gemeinheitsdürfnissen) — satisfying the needs of the municipality for example by acquiring land or housing property.
- B. Production for traffic. Activities serving the inhabitants of the municipality.
 - 1. Works owned by the municipality (water, gas and electricity works)
 - 2. Establishments for health care and public hygiene, e.g. slaughterhouses, markets, public baths and disinfectant centres
 - 3. Transport services, e.g. tramways, suburban railways, ports and warehouses.
 - 4. Institutes for education and training.

C. Municipal production plants: the acquisition of municipal property in land, production of food stuffs, papers and advertising agencies.

In his article *Gemeindebetriebe* (Municipal enterprises) C. J. Fuchs has discussed their significance from an historical and economic point of view. He includes in the concept *Gemeindebetriebe* both communally owned productive establishments and the institutions which provide public services.¹

At the beginning of this century the terms 'unmittelbare Wirtschaftspolitik' and 'Gemeindeindustrialismus' were also used and these included services relevant to the maintenance of general hygiene, e.g. sewerage, cleansing of the streets, slaughter-houses, waterworks, public baths and disinfectant centres, inspection of food, gas, electricity and public transport.

The term 'public utilities' was used, especially in the United States, as the opposite of 'private utilities'. Sometimes public utilities were understood to mean, in a more limited sense, water, gas, electricity and tramway undertakings. Sometimes also roads and sanitary services were included in this category. According to Knoop the public utility may be defined as a service in which a tendency to a local monopoly necessitates the intervention of a public authority to defend the interests of the consumer or a considerable section of the public.²

It is possible to generalize, however, like Dawson did by saying that municipal enterprise is a particularly popular solution in cases when:

- "1. the enterprise is concerned with the health, convenience and safety of the community (e.g. waterworks, sewerage, scavenging)
2. the commune is the largest consumer (e.g. light and power)

1. Carl Johannes Fuchs, Vorwort, in: *Gemeindebetriebe. Neuere Versuche und Erfahrungen über die Ausdehnung der kommunalen Tätigkeit in Deutschland und im Ausland*, Schriften des Vereins für Socialpolitik, Bd. 128, Leipzig 1908; Carl Johannes Fuchs, *Gemeindebetriebe*, in: *Handwörterbuch der Kommunalwissenschaften*, Bd. II, Jena 1922, pp. 241—241.

2. Knoop 1912, pp. 18—19.

3. the enterprise involves the use of public property (e.g. tramways in streets)
4. important monopolies are at stake (e.g. water and a number of utilities mentioned already)
5. private capital is not attracted by the prospective venture (e.g. abattoirs, stockyards)
6. the community can distribute more efficiently than private individuals (e.g. gas, electricity)
7. uniformity of action is desirable and conflict of authority should be prevented (the case with most public enterprises)"

According to Dawson it is worth bearing in mind, nevertheless, that the desire to raise revenue by means of indirect taxation was an equally dominant motive behind attempts to launch municipal enterprises and the German governments for example found this aspect particularly attractive. In trading undertakings the local authorities were normally given a relatively free hand subject only to some control by the state authorities.³

When looking at municipal trading one has to distinguish the remunerative enterprises from those subsidised by government from tax revenue. Indeed, the overall picture in this area would be quite confusing if the municipal trading policy based on the principle of self-support were confused with those municipal ventures which were deliberately subsidised from rate funds.⁴

In many quarters at the beginning of the 20th century some typical forms of municipal enterprise were in fact considered to have a monopolistic nature. Even if their scope might vary, for example the railway system, telephone and telegraph were national and others like water, gas and electricity were local, all enterprises of this sort required great capital investments in the area they serve in order to safeguard the distribution of the product or services which they were expected to supply.⁵

English scholars like Knoop tend to emphasize that when local authorities decided to subsidize an economic venture from the tax revenue the most probable reason was a sanitary one. Public baths for example had to be subsidized from public

3. Dawson 1914, pp. 213—214.

4. Knoop 1912, pp. 11—12.

5. Knoop 1912, p. 18.

funds because of the high admission fees which would have been necessary to keep them selfsupporting and this would have prevented the completion of the main purpose of the enterprise, the provision of bathing facilities for the lower classes. But in the balancing act of discouraging neither the lower classes nor the upper and middle classes from using the public baths through too high or too low fees the authorities normally found a solution by making a distinction between first and second-class baths. In addition some groups of the community, such as children, were frequently granted preferential treatment so that they were allowed to bathe at reduced charges or entirely free of charge. According to Knoop the building of houses was another type of civic enterprise often funded from tax revenue on public health and sanitary grounds. Naturally this did not apply to all the housing undertakings of local authorities, but only to such as had been carried out in connection with schemes for clearing unhealthy areas.⁶

Health reasons also figured very prominently during the lively debate on the ownership of wash-houses and cemeteries.⁷ In Britain the Parliamentary Return on Municipal Trading when discussing the inspecting and testing of milk inevitably made much of the health care arguments in its deliberations, even if the duty of milk inspection was considered to be the task of the state rather than of the local authorities.⁸

Other reasons used by local authorities for raising capital from local revenue funds was the general welfare of the community and then the object was, for example, the construction of bridges or launching municipal harbour and dock undertakings.⁹

On the other hand, the public attitude towards municipal gas and electricity works changed in the early years of this century and they were increasingly considered as lucrative business enterprises providing the city coffers with healthy profits.¹⁰

Indeed, in Britain the municipal provision of electricity was one of the issues triggering off a lively debate on which services

6. Knoop 1912, pp. 2—4.

7. Parliamentary Return 1901 relating to Municipal Trading, 1901, I—V.

8. Parliamentary Return 1901 relating to Municipal Trading, 1901, IV.

9. Knoop 1912, pp. 5—7.

10. Waller 1983, pp. 304—305.

should be subsidised by local rates and which forms of municipal enterprises should not be. Another area of debate was the provision of transport services. Because they could in fact benefit only a section of the community many people claimed that it was unjustifiable to use rate funds for supporting this kind of service.¹¹

In Germany, according to the famous statistician Otto Most the idea of municipal enterprises was already at the turn of the century so well established that there were no protests at the transfer, for example, of electricity, gas or waterworks to municipal ownership. On the contrary, many politicians thought that if the services were managed by cities or communes the general public could benefit from the profits.¹² Services were not only useful but also lucrative for the cities.

The Germans Jaffe and Kaufmann justify the transfer of ownership of gas, electricity and waterworks to the municipality by pointing out that these enterprises utilise the street network.¹³ Clearly it would be more efficient if all of such services were managed coherently. According to Jaffe also municipal management is absolutely necessary because the faultless functioning of these services is vital for bigger municipalities.¹⁴

The Prussian City Order Act of 19th November 1808 is considered to be the starting point of municipal enterprises in Germany. At that date the autonomy of cities was confirmed and thus the economic activities of the municipalities were also made possible. However, the actual roots of this could be traced to medieval rights over forests, meadows and waters.

According to a popular belief prevailing at mid 19th century it was possible to create the foundations of social well-being. The German statistician Most maintains that this was the origin of the municipalities' enthusiasm — and thus they

11. Knoop 1912, p. 10.

12. Most, 1913, Bd. 2, p. 9.

13. Richard von Kaufmann, *Die Kommunal финанzen* (Großbritannien, Frankreich, Preußen), Bd. I, in: Kuno Frankenstein and Max von Heckel (eds.), *Hand- und Lehrbuch der Staatswissenschaften in selbständigen Bänden, Zweite Abteilung: Finanzwissenschaft. V. Band*, Leipzig 1906, p. 47.

14. Georg Jaffe, *Die wirtschaftlichen Unternehmungen der Städte*, in: *Zeitschrift für Sozialwissenschaft*, Jg. 11, 1908, p. 432.

started to create public lighting, streets and roads, to look after the safety of the population and to establish gas and waterworks, as well as police services and some services belonging to the field of social policy.¹⁵ — At the same time in Britain it was becoming increasingly fashionable to discuss these matters, and one could clearly discern the 'emergence of municipal spirit' among politicians and the public at large.

Already in the 1840's a campaign was launched in Liverpool for the establishment of a public water supply. According to Fraser, who has studied the issue more closely, Samuel Holme, 'a leading propagandist' in this campaign read a paper on this matter to the Polytechnic Society maintaining that:

"This society will never be supplied as it ought to be while we are dependent on private companies. The supply ought to be provided by public authorities... paid for by the local rate levied on property and freely distributed for the benefit of all."¹⁶

Holme's propositions gained support and a few years later, in 1847, the Liverpool Waterworks Act gave the council authority to buy out the two water companies and to engage in the Rivington Scheme. This famous scheme for providing Liverpool with a water supply became, again according to Fraser, 'a monument to civil engineering: it was also a great tribute to municipal enterprise'.¹⁷

Responsibility for the environmental welfare of the community made many decision-makers to deliberate also in more general terms the increase of the public authorities' role in the cleansing of the streets, construction of sewerage systems and public health inspection as well as in clearances of slums. As a result, for example in Liverpool some 8,000 cellars were cleared under the Building Act of 1842 and Sanitary Amendment Act of 1854 between the 1840's and mid-1850's.¹⁸ Many individual decision-makers were quick, to recognize future changes, like John Tinne, a pioneer of public health

15. Most 1926, pp. 6—9; Hugo Lindemann, *Kommunalisierungsgesetz*, in: *Handwörterbuch der Kommunalwissenschaften*, Bd. II, Jena 1922, pp. 660—667.

16. Quoted in Fraser 1979, p. 31.

17. Fraser 1979, p. 36.

18. Fraser 1979, p. 100.

reforms in Liverpool or George Dawson in Birmingham, who, according to Hennock, was 'a prophet of the new movement (the Birmingham municipal doctrine widely accepted by the 1880's), public lecturer and heterodox preacher' supporting among other things also the establishment of public libraries and schools for the working class.¹⁹ According to Derek Fraser by the end of the Victorian era Liverpool, which had a long tradition of municipal services, experienced a new wave of humanitarianism producing an expansion of voluntary charities in that city whereas Birmingham, where the local elite had always been active in philanthropic work, became a model for a successful municipalization policy.²⁰

By the end of the 19th century, in the face of the new challenges provided by newly invented forms of urban technologies, the decision-makers had to make a choice: who or which body would take care of tramway lines for example, who would own the sources of energy. Another factor, making the issue of municipal ownership a topical one, was the growing strength of the labour movement both in Britain and Germany as well as in the Nordic countries and the socialists in those countries adopted a positive stand in favour of municipal ownership.

Many decision-makers had to make clear in their own mind their position in relation to municipal ownership and to compare this idea with the notion of state socialism.

The target of municipal socialism was included in the programmes of many social democratic parties. On the lines of the programme endorsed in Erfurt for instance the Finnish Social Democratic Party included this concept of municipal socialism in their programme in 1903. In Sweden it was approved in 1905.²¹ Indeed, the policy of municipalization was

19. Fraser 1979, p. 37; According to Hennock Joseph Chamberlain is generally considered "the most prominent exponent of the Birmingham municipal Doctrine". The creator of this doctrine was, however, George Dawson, not Chamberlain. Hennock 1973, pp. 62—63.

20. Fraser 1979, p. 102.

21. Kunnallinen ohjelma, Suomen sosialidemokraattisen puolueen ohjelma 1903, toim. Yrjö Sirola, Helsinki 1906; Svenska Socialdemokratiska Arbetare partiets Politiska Programm, Kommunalprogramm, Partistadgar och grundstadgar för kommunerna — Antagna å partiets sjette kongress i Stockholm 17.—25. februari 1905, Stockholm 1905.

well suited to the objectives of the socialist parties, i.e. to strengthen and to expand local self-government.

Also the progressive parties both in the United States and in Great Britain adopted the idea of public ownership (public utilities) as part of their programmes. The increasing interest in this matter is displayed in the growing volume of books with titles containing terms such as 'municipal enterprise', 'municipal ownership' or 'municipal trading'. For example in the United States both the Brooklyn Public Library and the United States Library of Congress published, in 1906, a catalogue on books dealing with municipal ownership. The *Books on Municipal Ownership* issued the former library contained 75 works. The bibliography by the latter was published under the title *Select List of Books on Municipal Affairs with Special Reference to Municipal Ownership*.²²

Public or private enterprise? Discussion in Great Britain

In the middle of the 19th century priority in the development of services was placed in Britain on public order, fire protection, paving and cleansing and lighting of streets as well as the development of sewerage and some basic sanitary services (Medical Officers of Health) as is well documented for example in the studies of the Victorian municipal administration mentioned above (Hennock, Fraser).

The scale of the whole question of municipal ownership was, however, totally different from the scope of public utilities and municipal trading discussed a few decades later. Credit for this development has often been given in part to the Fabian Society who were staunch supporters of the municipalization of services though some observers also point out that even if the question of municipal trading was more controversial than any other issue in Britain at that time it was, nevertheless, not considered a matter of party politics. Many Councils seemed to

22. David E. Nye, *Public Relations as Covert Political Communication: The debate over Public vs. Private Utilities in the United States*, *American Studies in Scandinavia*, Vol. 16, 1984, pp. 22 and footnote 2.

embark on municipal trading without fully appreciating the political implications of their actions.²³

It may be true that these developments in Britain were mainly the results of improvisation and the application of common sense to the acute problems of the day. Even so municipal trading with its implied collectivism caused extensive public debates during the last decades of the 19th century and the early years of this century. The topic was also discussed in two Parliamentary Committees in 1900 and 1903 (*Report from the Joint Select Committee of the House of Lords and the House of Commons*). They had ordered a survey to be made of Local Government Board Returns in 1899 and 1902 and it dealt with all remunerative undertakings carried out by Municipal Corporations.²⁴ The publication of the first report in 1900 was followed by an animated debate on the proper budgeting and auditing of municipal trading²⁵ and, as a result, the Government proposed a Joint Committee to look into the matter more closely. In its second report published in 1903 the Committee proposed some reforms in the existing system: a) The system of audit applicable to corporations, county councils and urban district councils in England and Wales should be abolished. b) Auditors, who were members of one of the leading professional bodies should be appointed by the three above mentioned groups of local authorities. c) The appointment should be approved by the Local Government Board after

23. Waller 1983, p. 298.

24. Report from the Joint Select Committee of the House of Lords and the House of Commons on Municipal Trading, 1900, VII; Municipal corporations' reproductive undertakings. Return of Water, Gas, Tramway, Electric Lighting and other Reproductive undertakings carried on by Municipal Boroughs in the following Local Government Board, S. B. Provis, (ordered by the Secretary of the House of Commons to be printed 7.3.1899), Parliamentary Papers 1899 LXXXIII.1; Return of the Reproductive Undertakings carried on by Municipal Boroughs ordered by the House on the 4th day of August 1898) Brought up to the 31st of March 1902 (in continuation of Parliamentary Papers No 88 of session 1899, Parliamentary Papers 1902, XCIV); Local Government Board 16.12.1902, S. B. Provis ordered by the House of Commons to be printed 16.12.1902, Parliamentary Papers 1902, XCIV.

25. The Municipal Journal 2.1.1903, pp. 10—11; The Municipal Journal 9.12.1904; Municipal Trading Results, The Local Government Review 2, 1912, Vol. V, pp. 49—51.

hearing the possible objections of the ratepayers. In addition it was recommended that the auditor should have access to all the papers, books, accounts, vouchers, sanctions for loans etc. necessary for his examination and certification.²⁶

The appointment of the joint parliamentary committees seemed to have also called forth discussion on municipal trading in principle in the Association of Municipal Corporations, which already by the 1890's was by far the most representative body of civic opinion and in which a number of members of parliament were also serving. At the annual dinner of the Association on March 30th 1900 the Rt.Hon. Henry Chaplin, M.P., President of the Local Government Board, reminded his audience,

"One of the main duties of a municipality, and I am sure that all who hear me will agree, is to serve the interests of their own people in their own area, and that, I think, with great respect, if I may say so, ought to be one of the first and the most governing considerations which can be made to their policy. And even here, if I may venture to express my own opinion, there ought to be considerable latitude".²⁷

At the annual meeting held the next day some doubts were expressed about whether the Joint Committee were able to acquire sufficiently many-sided and regionally representative information.²⁸ When the Association decided to support the "imminent appointment of a Committee" it was emphasized that the information concerning municipal trading should be collected from as many towns and cities as possible.²⁹

26. Report from the Joint Select Committee of the House of Lords and the House of Commons on Municipal Trading together with the Proceedings of the Committee. Minutes of Evidence, Appendix and Index, Parliamentary Papers 1903, VII.

27. Extract from a speech by Rt. Hon. Sir Henry Chaplin (President of Local Government Board) at the Annual Dinner of the Association on the 30th March 1900: It is of interest as bearing upon these questions. Municipal Trading Association of Municipal Corporations, 27th Annual Report, Index of Minutes for the year 1900, p. 72.

28. Alderman Higginbottom (Manchester), Association of Municipal Corporations, 27th Annual Report, Index of Minutes for the year 1900, p. 69.

29. Sir Albert Rollit, *ibid.* pp. 69—70.

There were many reasons given for opposing municipal trading. Very often it was assumed to increase the liabilities of the city to an unhealthy extent and thus cause an increase in the rates. In some quarters it was also thought to be the first step on the road to socialism.³⁰

Some conservative organizations representing landowners and ratepayers like the Liberty and Property Defence League (est. 1882), the Industrial Freedom League (est. 1902, associated in 1908 with the Anti Socialist Union) and the London Municipal Society (est. 1894) were supporters of extreme *laissez-faire* economic policies.³¹

One of the founders and leading figures in the Liberty and Property Defence League was Lord Elcho, later the Earl of Wemyss, who had begun his career as an organizer and fundraiser for anti-socialist and anti-trade-union activities. From the beginning this League of Wemyss appealed to a number of groups fearful of overlegislation and of 'the People's William' (Gladstone) including discontented Whigs, extreme Tories and old-fashioned radicals, landlords and some of the leading commercial and trade groups in Britain. In his article on the activities of the League Edward Bristow points out that

"The day to day administration of the league and the function of disseminating anti-socialist propaganda, which ran the gamut from pamphlet to lecture to puppet show was left to a group of near-anarchist disciples of Herbert Spencer who styled themselves 'Individualists'."³²

The supporters of these leagues included also some of the leading intellectuals of the day who had drifted away from the Liberal Party, like Sir John Lubbock, later Lord Avebury, who was the President of the Industrial Freedom League. An example of those who also aimed at defending their own financial interests was Emile Garcke, an engineer active in Lubbock's League for Private Ownership, who at one point it

30. London Municipal Society. *The Case against the Labour-Socialist Party, A Handbook of Facts and Figures*, London 1910.

31. Bristow 1975, pp. 761—768.

32. Bristow 1975, p. 761.

was claimed, controlled some 15 per cent of all the tramways in the United Kingdom.³³

Lord Avebury, who according to Offer was "a polymath naturalist, author, banker" was in fact the leader of "London Conservatism" and led the anti-municipal campaign. His work *On Municipal and National Trading* was well-received, with particular acclaim being given to its anti-socialist attitudes.³⁴ In this work Lord Avebury attacked municipal trading for several reasons:

"Firstly, the legitimate functions and duties of our municipalities are already enough, if not indeed more than enough, to tax all their energies and fill up all their time. Secondly, it has involved, and will involve an immense increase in municipal debt. Thirdly, it will involve municipalities in labour disputes. Fourthly, as there will not be the same stimulus to economy and attention, there will be a great probability, not to say certainty, that one of two things will happen; either there will be a loss, or the service will cost more. The working classes will, of course, be the greatest sufferers. Fifthly it is a serious check to progress and discovery."³⁵

In his arguments against municipal trading Lord Avebury also pointed out that

"Governments and Municipalities cannot work as economically as private enterprises and it follows that municipal trading must increase our rates more and more, while at the same time it raises the price of necessities so that it cuts down incomes with one hand and with the other makes life more expensive."³⁶

33. Offer 1981, pp. 236—237.

34. Lord Avebury, *On Municipal and National Trading*, London 1907. Lord Avebury was highly praised by his readers for his book. Lord Aylesbury for example wrote: "It is indeed a most serious subject and has tended more towards the increase of socialism than anything else. Again thanking you for your courtesy", The letter of Lord Aylesbury to Lord Avebury 1.12.1906; Lord Argyll argues "All you say is very true", the letter of Lord Argyll to Lord Avebury, Lord Avebury's Papers, Correspondence 1900—1907, British Library.

35. Avebury 1907, pp. 3—8.

36. Avebury 1907, p. 16.

He assumed also that municipal trading would introduce a 'gigantic bureaucracy' while it would be absolutely impossible for councillors to spare that time and attention without which gigantic civic business enterprises could not be carried out profitably and successfully.³⁷

These viewpoints were expressed in several other publications, for example a pamphlet *Municipal Trade and Municipal Ownership* by Major Leonard Darwin³⁸, *Municipal Ownership in Great Britain* by Hugo Meyer³⁹, *The Dangers of Municipal Trading* by Robert P. Porter⁴⁰ and *Socialism in Local Government* by W.G. Towler⁴¹, the secretary of the London Municipal Society, all displayed an unfavourable attitude towards municipal trading. This was believed to be a shortcut to socialism or as W.G. Towler put it, municipal trading was

"... the first systematic effort to deal with the silent and almost unobserved invasion of British Local Government by the forces of Modern Socialism."⁴²

Like Towler many people were sceptical about the statistics presented on municipal trading, for example about the balances published in the Local Government Board Returns. Like Leonard Darwin, Towler also tried to prove that the profit from municipal trading was by no means used for the benefit of all social classes and that the gross profit itself was not sufficient proof of financial success; according to him it was necessary to deduct first from the gross profit the interest on the debt of the undertaking as well as the funds for annual repayment, not to mention an allowance for depreciation. The actual net profit, i.e. the surplus after making these provisions, could only be counted against the relief of rates. But if there

37. Avebury 1907, pp. 32—33.

38. Leonard Darwin, *Municipal Trade. The Advantages and Disadvantages resulting from the substitution of Representative Bodies for Private Proprietors in the Management of Industrial Undertakings*, London 1903.

39. Hugo Richard Meyer, *Municipal Ownership in Great Britain*, London and New York 1906.

40. Robert P. Porter, *The Dangers of Municipal Trading*, London 1907.

41. W. G. Towler, *Socialism in Local Government*, London 1908.

42. Towler, 1908, p. V.

was a deficit, then the whole venture in fact was making losses for the municipality.⁴³

Another strong attack on municipal trading was contained in *The Dangers of Municipal Trading* by an American statistician, Robert P. Porter⁴⁴. Porter wanted to demonstrate first of all how undesirable it was for both national and local government as well as being a real menace to progress and society. He also wanted to prove it financially unsound and supported his argument by scrutinizing several public undertakings. The book was based on lectures Porter had given for the British Association, the Society of Arts, the London School of Economics and the London Chamber of Commerce. Undoubtedly his argument had also been sharpened by his discussions with George Bernard Shaw, who was rather inclined to support municipal trading and later even published an essay in its defence.

Indeed, the issue of municipal ownership and its possible extension was a very topical one among intellectuals in the early years of this century and it was also included in the programmes of various reform movements, first in France, Belgium and Britain and then all over Europe. In Britain the Fabian Society had already in the 1890's started to advocate the municipalization of public services like water, gas, electricity and tramways. The leading figures of the Society, Sidney and Beatrice Webb, were staunch supporters of municipal trading and they received formidable backing from Shaw who wrote a strong defence of municipal trading *The Common Sense of Municipal Trading*, published as no 5 in the *Fabian Socialist Series*.⁴⁵

On the other hand the opponents also were equally formidable. In 1902 when opposition towards municipal trading was at its peak *The Times* published as a separate booklet under the title *Anti-Municipal Crusade* all sixteen

43. Towler, 1908, pp. 45—46; Darwin 1903, p. 174.

44. Porter 1907, p. IX; Robert P. Porter, *The Conflict over Municipal Trading*. Lecture delivered before the London School of Economics and Political Science, University of London on March 13th 1903, Westminster 1903.

45. Bernard Shaw, *The Common Sense of Municipal Trading*, the Fabian Socialist Series, No. 5, London 1908.

articles on municipal trading published earlier in its pages.⁴⁶ The 'progressives' who supported the development of public services considered these attacks by *The Times* to be only part of a wider campaign against municipal trading and believed that in this campaign a dominant role was played by private business enterprises and by a number of conservative organizations representing landowners' and ratepayers' interests. In its leader on January 2nd 1903 the *Municipal Journal* wrote:

"The twelve months has witnessed the repulse of the first organized attempt to Americanise our civic system. The Times articles and attacks by powerful private companies upon the franchises of English cities and towns are not isolated and unconnected incidents; they represent the first stages of a well-prepared campaign which has for its object the wholesale capture of the public services. The attack is not without its moral for America itself, as its success would materially weaken the very strong movement that is now going on over the water in favour of modelling municipal practice there on English lines."

At the same time the leaderwriter pointed out that *The Times* articles had nevertheless actually served the cause of municipal trading by rivetting

"... attention upon a branch of government that has hitherto been neglected by the average citizen; the 'man in the street' now sees that his preconceived idea of municipal work being wholly concerned with drainage and paving is entirely wrong. The Times writer made the mistake of all controversialists who allow their judgement to be warped by animus. He overstated his case to the verge of absurdity."⁴⁷

Yet the president of the Association of Municipal Corporations, a powerful public speaker and in 1889 the chairman of the Na-

46. The Times 19.8, 23.8, 28.8, 2.9, 5.9, 8.9, 10.9, 18.9, 22.9, 25.9, 30.9, 6.10, 13.10, 21.10, 30.10, 11.11.1902. These articles were assumed to be written by E. A. Pratt, See Offer 1981, p. 237, footnote 65.

47. Notes and Comments. The Municipal Year, The Municipal Journal 2.1.1903, p. 10.

tional Union of Conservative Associations, A. K. Rollit, displayed his full confidence in the importance of municipal trading when speaking to the members of the Association in 1902:

"Whatever may be said outside, you gentlemen coming here many times a year from the scenes of your own activities and effort, I venture to say that everyone of you, and all those who know anything practically of that life, are convinced that in supplying, as the Corporations have done, the prime necessities of human life for the people, in purity and plenty — pure water and pure light, and pure air — in making, both physically and intellectually, the lives of the people more liveable, and the conditions of work more reasonable and fertile, they, the great corporations of this country, have not only advanced in their own generation — because on advantage of municipal institutions and municipal work is that we can see the fruits of it, that we can test it by experience, that we can act tentatively, and rightly tentatively, and even experimentally within due bounds, changing our course if practical experience demands it, or if those who send us to their councils think differently from ourselves. — I believe that the results of the work done by municipalities for this country has been, in its effect, to advance the welfare and happiness of the whole nation; and for my part, if it were ever to be a question of choosing between the ties of party or the survival and development of our system of local government, of the continuance of the institutions and work of local self government, I should not have a moment's hesitation in deciding that the party to which I should belong would be the Municipal Party of the country, and I hope and believe that is a feeling which should and would animate most if not all of yourselves. (Cheers.)"⁴⁸

48. Speech by Sir Albert K. Rollit, 22.10.1902, Report of the proceedings of the autumn general meeting, on the 22nd of October 1902, Association of Municipal Corporations, 29th Annual Report, Index to Minutes for the year 1902, p. 50.

According to Rollit the municipality should do what individuals cannot do so well themselves and when carrying out this policy "the adoption of what is good (in socialism) is the best way of preventing what is bad".⁴⁹

The defenders of municipal trading considered the policy of municipalization as well as the development of services as an important method for levelling out social class differences. Thus A. J. Balfour for example saw "social legislation . . . (as the) direct opposite and . . . most effective antidote" to socialist legislation.⁵⁰

Nevertheless they felt it also necessary to try to make a clear distinction between the municipalization policy advocated by the communists and the municipal trading policies employed by towns and cities. At the end of 1893 Dr H. M. Robinson, Vestry Clerk of Shoreditch, was reported by *London* as saying that he considered

"Municipal Socialism to be one of the greatest forces which would tend to solve most of the problems which were now being considered by thinking people as demanding solution. He pointed out the difference between the ordinary ideas of Socialism and those of Municipal Socialism by showing how voluntary communistic societies and undertakings had failed by reason of their voluntarism and want of binding force, and how schemes that had the force of law and rule, compulsorily observed, had been the most successful. The maintenance of the roads had been municipalized with success, for previously it was found that their maintenance by private persons was a failure, both as to uniformity and efficiency."⁵¹

The adversaries of municipalization policies did not recognize any great difference between state socialism and socialism in municipal government. Indeed, in his introductory note to *Socialism in Local Government* by W. G. Towler H. M. Jessel points out that "it is impossible to draw a dividing line

49. Quotation from Rollit, in: Waller 1983, p. 300.

50. Quotation from A. J. Balfour, in: Waller 1983, p. 299.

51. Dr. H. Mansfield Robinson (Vestry Clerk of Shoreditch), *Municipal Socialism*, London 7.12.1893, p. 725.

between State Socialism and Socialism in Municipal Government". Quoting Sidney Webb, opponents expressed the fear that

"The path to the Town Utopia of Collectivism is unlimited municipalization of local public services and a wide extension of co-operative activity."⁵²

Both the supporters and the adversaries of municipal trading looked abroad in search of support for their opinions. The advocates referred to the examples of German cities⁵³ as well as to positive experiences of municipalization in Paris and Italy⁵⁴. The opponents looked to America for the further backing of their views.⁵⁵ Already in 1893 the journal *London* wrote

"Most German cities manage their own gas and waterworks. The tendency on the part of German municipalities to take over those industries which were formerly intrusted to a great extent to private companies is due, says Mr. Orage, the secretary of the Labour Commission, in part to the desire to utilize such fruitful sources of income, but also to secure the public against extortion with regard to the necessities of life."⁵⁶

The administrative system of German cities and the power they exercised over municipal trading roused especially wide interest in Britain and it was the German model on which the progressives in particular based their arguments.⁵⁷

52. H. M. Jessel, Introductory note, in: Towler 1908, p. XI.

53. Knoop 1912, pp. 76—116, 271—276; Dawson 1914, pp. 209—259; Howe, 1915, pp. 188—189; Municipal Slaughterhouses, A public need — a text book on the subject. Record of Progress in Germany, The Municipal Journal 28.6.1901, p. 479; Lessons from Germany, The Municipal Journal 17.1.1902, p. 51.

54. Municipalisation in Paris, Notes and Comments. The Municipal Journal 20.1.1905, p. 51; The Municipal Code of Italy, A Government Scheme to facilitate Public Ownership, The Municipal Journal 27.6.1902, p. 521.

55. Robert P. Porter, The Conflict over Municipal Trading, Lecture at the London School of Economics on 13.3.1903; W. G. Towler, Municipal Trading, Company versus Municipal Administration. Lecture to the Newcastle Economic Society, January 18th 1911, publ. by the London Municipal Society, Municipal Reform Pamphlet, No. 45—1911, London 1911.

56. Municipal Enterprises in Germany, London 30.11.1893, p. 707.

57. Dawson 1909, p. 15.

The progressive *London*, (later published under the name *the Municipal Journal*) followed closely the public discussion of municipal trading recording the attacks in *The Times* and commenting on the situation in its leaders.⁵⁸ In the same manner it reacted to the statements on municipal ownership by Americans, such as that by Robert P. Porter, who had sent a paper from London to a conference on municipal ownership held in New York in 1903. In its report on the event the *Municipal Journal* pointed out that Porter's paper was a thoroughly one-sided statement consisting mainly of rehashed collection of extracts from the literature.⁵⁹ Far more space was given, however, to the reporting of new developments. It is interesting to observe the enthusiasm with which the journal notes the progress of municipalization policies in British towns and cities. The headlines employed throw much light on its stand: 'Glasgow Tramways, Municipal Control brings safe and comfortable Cars' (June 1893)⁶⁰, 'Glasgow Tramways. A Notable example of Collectivism' (June 1894)⁶¹, 'The Success of Glasgow municipal tramways continues' (Sept. 1894)⁶², 'Profitable Municipal enterprise in Leeds'⁶³, or 'Newcastle tramways. Victory for Municipalisation'⁶⁴. In addition to tramways matters related to water supply and its control were also given

58. The Times Attack on Municipal Enterprise, *The Municipal Journal* 19.9.1902, pp. 771—772; Notes and Comments, *The Municipal Year*, *The Municipal Journal* 2.1.1903 p. 11; Notes and Comments. An "Anti-Municipal Trading League", *The Municipal Journal* 20.10.1905, p. 1189.

59. Municipal Ownership in America, *The Municipal Journal* 13.3.1903, p. 255; "American Municipal Progress". A Notable Book, *The Municipal Journal* 12.12.1902, p. 1018.

60. Glasgow Tramways. Municipal Control brings safe and comfortable Cars, *London* 1.6.1893, p. 278.

61. Glasgow Municipal Tramways. The Glasgow Corporation Begins to work its own Tram Cars on Sunday. A Notable Example of Collectivism, *London* 28.6.1894, pp. 401—402.

The Municipal life in Glasgow was described also for example in a series of articles: How Glasgow is Governed, published in *London* 23.7.1896, pp. 695—700; *London* 30.7.1896, pp. 719—724; *London* 6.8.1896, pp. 743—747; *London* 13.8.1896, pp. 767—773; *London* 20.8.1896, pp. 791—796.

62. The Success of Glasgow's municipal tramways continues, *London* 6.9.1894, p. 563.

63. Profitable Municipal Enterprise in Leeds, *London* 19.9.1895, p. 793.

64. Newcastle tramways, Victory for Municipalization, *The Municipal Journal* and *London* 24.2.1899, pp. 104—105.

considerable attention in the 1890's: 'Prospects of a Municipal Water Supply'⁶⁵ or 'Edinburgh's New Water Supply'⁶⁶.

Nor did the journal limit its observations to domestic developments. It was also eager to present, from 1893 onwards, scores of examples of successful municipalization policies carried out abroad, as in Paris⁶⁷, in Vienna⁶⁸, in some Italian cities⁶⁹ as well as in Budapest, Brussels and some German cities.⁷⁰ On February 19th 1904 the *Municipal Journal* reported on the Dresden Exhibition of German towns under the headline 'Municipal Enterprise in Germany, the New Era and Its Work'

"Standing as it does on the threshold of a new municipal era, the Exhibition at the same time naturally gives a resume of the results of German municipal activity in the past. Foremost in interest — especially for municipal workers in this country — among the forms of that activity come, of course, those relating to what we mis-term municipal 'trading'. In this domain the German municipalities, it may be stated at once, pursue less a social object,

65. Prospects on a Municipal Water Supply London 22.2.1894, p. 114.

66. Edinburgh's New Water Supply, The Municipal Journal 11.10.1894, p. 654.

67. Municipal work in Paris, London 22.10.1896, pp. 1007—1009; Underground Paris. A Curious Aspect of Municipal Work, The Municipal Journal 19.1.1900, p. 47; Notes and Comments. Municipalization at Paris, The Municipal Journal 20.1.1905, p. 51; Lessons from Paris I, The Municipal Journal 16.2.1906, pp. 171—173; Lessons from Paris II, The Municipal Journal 23.2.1906, pp. 199—200; Lessons from Paris III, The Municipal Journal 2.3.1906, pp. 233—234; Lessons from Paris IV, The Municipal Journal 9.3.1906, pp. 261—262; Lessons from Paris V, The Municipal Journal 16.3.1906, pp. 284—285.

68. The Congress of Capitals, by Sir Edwin Cornwall, The Municipal Journal 29.12.1905, p. 1455.

69. Municipal Italy. The Growth of the municipal Movement, The Municipal Journal 5.4.1901, p. 259.

70. Eg. Municipal Enterprises in Germany, London 30.11.1893, p. 707; L. H. Hayter, Municipal Work in Berlin, London 23.1.1896, pp. 74—75; Municipal nursing Home. Another Object, Municipal Journal 21.6.1901, pp. 457—458; Germany and England, The Municipal Journal 1.1.1904, p. 12; German Municipal Institutions, The Municipal Journal 31.3.1905, p. 310; Frankfurt Tramway Service, The Municipal Journal 22.6.1906, p. 679; W. H. Dawson, The Government of Berlin, The Municipal Journal 4.12.1908, p. 985. See also L. H. Hayter, Municipal Work in Buda-Pesth, London 9.4.1896, p. 334; L. H. Hayter, Municipal Work in Brussels, London 20.2.1896, p. 167.

as that, for instance, the elimination of the private speculator in monopolist concerns, than the purely financial one of relieving the burden of the rates . . . (The German municipalities have developed their activities: 1899 out of 48 towns (with a population of and over 50,000) who have made a return 41 own their own gas works and manage their own gas supply. All the 48 towns mentioned above had their own waterworks and 20 supply their own light.) What we find here is something that must shock every municipal worker here."

According to observers what was significant in the municipal works in Germany were the huge profits, which were compared with the relevant British figures.⁷¹

In the United States also the press strongly reacted to the issue of municipal trading (public ownership). According to a study by David E. Nye "Every newspaper carried editorials on public versus private utilities; every politician had to take a stand on the subject". Existing works of research dealing with these matters have proved that the arguments employed by Americans were the same as those used in Britain. The notion of public utilities was attacked because of apprehension of too rigid control. Manufacturers as well as economists of the *laissez faire* school of thought were afraid of the possible transfer of power to the hands of politicians, who might be guided by other principles than those of business economics. The possibility of corruption was appalling as was the likelihood that public ownership would prevent free competition. It was also assumed that public sector could not follow the latest technological developments at the same rate as the private sector that the publicly owned enterprises were not able to employ adequately competent personnel.⁷²

The supporters of public ownership on the other hand emphasized that this form of ownership would guarantee the same opportunities for all consumers. Examples of successful

71. Municipal Enterprise in Germany. The new Era and its Work, The Municipal Journal 19.2.1904, p. 147.

72. Winthrop M. Daniels, Municipal Ownership, in: American Economic Association, Publications, series 3, vol 7, n:o 1, New York 1906, pp. 133—134.

municipalization policies were taken from the experience of Birmingham, Glasgow and some German cities and particular attention was at that time paid to the ownership of tramways. Of the American developments the municipal ownership in Chicago also aroused great admiration.⁷³

German discussion on municipal enterprises

Information on municipal enterprises in Germany were efficiently disseminated by statistical publications, like the *Statistisches Jahrbuch Deutscher Städte*, and by a great variety of periodicals as well as by the series *Schriften des Vereins für Socialpolitik*.⁷⁴ A particularly strong advocate of municipal ownership was the socialist Hugo Lindemann and the periodical, the *Kommunale Praxis*, published jointly with Albert Südekum, which gained a wide circulation among municipal authorities in America as well as in the Nordic countries.⁷⁵

On the basis of every source it was possible to become convinced that at the turn of the century the German cities were far ahead of other European towns and cities so far as the ownership of municipal enterprises, and in particular of infrastructure, was concerned, and comparisons, for example,

73. Nye 1984, footnote 5, p. 34; Charles Whiting Baker, *Monopolies and the People*, New York 1899; see also Frederic C. Howe, *The City, the Hope of Democracy*, New York 1905; and Howe 1913, pp. 43—67.

74. E.g. *Städte-Zeitung*, *Zeitschrift für Kommunaltechnik*, Berlin 1903/04—1912; Paul Mombert, *Die Gemeindebetriebe in Deutschland*, *Allgemeine Darstellung*, *Schriften des Vereins für Socialpolitik*, Bd. 128, Leipzig 1908.

75. *Kommunale Praxis* for example was easily available also in Finnish libraries and its articles were summarized in the following periodical: *Yhteiskuntataloudellinen aikakauskirja* 1906—1912; Together with the *Kommunale Rundschau* it is also mentioned as one of the most important municipal information journals in the book Yngve Larsson, a Swedish local politician and the secretary of the Swedish Town Association, Yngve Larsson, *Kommunalförvaltningens organisation och arbetssätt. I Sveriges, Englands, Frankrikes, Preussens, Österrikes, Danmarks och Norges städer*, Stockholm 1909, p. 146.

with regard to water, gas and electricity works were published within the framework of municipal statistics from every country.⁷⁶ As the editor of the *Municipal Journal* pointed out on January 1st 1904:

"As our readers are aware from the articles that have from time to time appeared in our columns, municipal enterprise in Germany is much more advanced than here."⁷⁷

The enterprise of German cities was much admired and it was claimed that finance and economic profit were the real incentives for their municipalization policies.⁷⁸ Indeed, some observers had preferred to speak about municipal capitalism rather than municipal socialism⁷⁹ and the correspondent of *The Times* made the point in his article that

"Municipal activity in Germany has, generally speaking, nothing to do with 'Socialism' and it is often most highly developed in localities where there is not a single Socialist on the Council."⁸⁰

While the British were emphasizing the social grounds for municipal trading⁸¹ the German municipal enterprises were acknowledged to be managed on sound business principles.⁸² So for example profitability was the reason why it was thought desirable in Germany to take gasworks into municipal ownership⁸³ — the profit they yielded being the highest when compared with other municipal business enterprises. Also electricity works, ports, docks and harbour railways as well as cattle yards and slaughterhouses were considered profitable,

76. See for example the Finnish Official Statistics XXXI 1 and 3—4, Helsinki 1910—1919.

77. Germany and England, *The Municipal Journal* 1.1.1904, p. 12.

78. Municipal Enterprise in Germany, *The Municipal Journal* 19.2.1904, p. 147.

79. Waller 1983, p. 300.

80. Municipal Enterprise in Germany. The new Era and its work, *The Municipal Journal* 19.2.1904, p. 147.

81. Industrial Conditions in Germany (*The Times* 1904), quoted in the *Municipal Journal* 1.1.1904, p. 12.

82. Dawson 1914, pp. 208—224.

83. See for example *Zeitschrift für Sozialwissenschaft* 1907, Heft 7/8.

while some hesitation was expressed over constructing sewers, subways and pedestrian bridges.

"We have seen that the sewerage and drainage system is in the care of the city administration and this is also more often than not the case with gas, electricity and water works. There are good grounds for that. These undertakings use the street network of the city and thus it is appropriate that they are managed centrally."⁸⁴

These enterprises were almost always monopolistic in nature and as a general rule these monopolies were managed by the city administration for private monopolies would easily have lead to the exploitation of consumers. The other reason for the city control of these undertakings was the fact that the flawless functioning of these institutions was vital for every big municipality.

So far as the tramways were concerned it was also stressed that an extensive traffic policy, in which financial matters were not the only consideration, had an especial significance for the building of houses and consequently for the standard of housing. Therefore it was the most important part of social policy.⁸⁵

The city's economic performance was, however, the most decisive factor. There could be no dispute that a city took responsibility for enterprises which were either necessary or desirable for the general public and which were not sufficiently profitable to attract private capital — for example markets, market places, slaughterhouses and cattle yards as well as economic functions demanded by trade and industrial enterprises like ports, docks and harbour railways.

German sources acknowledged also the impact in Germany of the pioneering work of the British Fabian socialists promoting public services and the Burgomaster of Frankfurt am Main, Dr. Adickes, for example returned to this in his lecture at the First German City Conference in Dresden in 1903

84. v. Kaufmann 1906, p. 47.

85. Jaffe 1908, pp. 432—433.

and stated that the Fabian Society was the actual founder of Municipal Socialism.⁸⁶

When examining the question of private/public enterprise in cities H. Lindemann started by investigating with which capital and by whom the gas and electricity works and tramways were originally built. In the case of transfers to municipal ownership Chambers of Commerce and representatives of private enterprise in particular had objected — for example to the production of gas with the use of public funds — on the grounds that after municipalization very few improvements could be expected. "In der Tat sind es die Privatgesellschaften die das Tempo angeben" — it was though that lack of competition killed technological development. This meant that the contest over price had become a contest over quality. In order to dispel this claim Lindemann, however, presented examples of infrastructural services which pointed to the contrary conclusion. Taking as an example gas, launched with the aid of British and Belgian capital, and measuring the efficiency of lighting by the number of gaslights in every year from 1895 to 1900 Lindemann was able to claim that there had not been significantly less gaslight in cities with public gasworks than in those with private gasworks (Aachen, Augsburg, Dortmund, Frankfurt am Main, Frankfurt an der Oder, Hanover, Munich, Strasbourg, Stuttgart). He also pointed out that unit price of gas as well as the cost of the construction of gasworks were cheaper in the large cities where gas was produced by public funds — this applied whether gas was produced for lighting, heating or industrial use.⁸⁷

The ownership of the enterprise was reflected also in the fees paid by the consumers. For example Paul Mombert divides the cities so far as waterworks were concerned into three groups,

86. Franz Adickes and Otto Beutler, *Die sozialen Aufgaben der deutschen Städte. Zwei Vorträge gehalten auf dem ersten deutschen Städtetage zu Dresden am 2. September 1903*, Leipzig 1903. In British publications the achievements of German cities as providers of municipal services were used as arguments from the 1890's onwards.

87. Hugo Lindemann, *Arbeiterpolitik und Wirtschaftspflege in der Deutschen Städteverwaltung*, Bd. II *Wirtschaftspflege*, Stuttgart 1905, pp. 48—53, 125.

- 1) cities which paid no depreciations on the basis of the value of the works in addition to the repayments of the capital debts,
- 2) cities which paid depreciations according to the common practice, which approximately meets the wear and tear on the works and machinery,
- 3) cities which paid percentage depreciation (in general 1—2 per cent), the size of which was decided beforehand.

These choices determined generally the water-rates demanded from consumers.⁸⁸

The development of technology had a decisive influence on the nature of infrastructural services. In the early years of the 20th century the launching of electricity first in lighting, then as a general form of power also partially altered opinions on the municipal ownership of services. In criticisms of municipal business enterprises some of its drawbacks were, however, also set out clearly,⁸⁹

- the hands of public enterprise were tied too much, for the civic administrative organization was often too restrictive so far as for example hiring competent management for enterprises was concerned, as happened in Strasbourg;
- often in the meetings of City Councils and similar bodies very few experts were present with the necessary business skills and foresight;
- the calculated profit surpluses in many cases did not materialize or were unexpectedly small because of increases in wages, decreases in tariffs etc.

It was also thought that the need for industrial electricity in particular, demanded of the municipal enterprises more flexibility in the framing of agreements and in price policy. There had been difficulties in getting the necessary special agreements accepted by the decision-making bodies in many municipalities. In addition it was claimed that the linking of industrial enterprises to the electrical network was carried out slowly and this created dissatisfaction with municipal enterprises among the industrial entrepreneurs.

88. Paul Mombert, *Die Gemeindebetriebe in Deutschland*, Schriften des Vereins für Socialpolitik Bd. 128, Leipzig 1908, pp. 15, 17.

89. Passow 1923, pp. 128—129.

So far as tramway undertakings were concerned personnel policy created special problems, because party political and electioneering tendencies were also beginning to have an influence on municipal politics.

The solution to these problems was either the joint municipal and private ownership of enterprises, advocated by Passow, or a return to private business enterprises, suggested by Robert Haas who thought that municipalization reflected socialism.⁹⁰ The problem of ownership was particularly acute in the cases of electricity and gas works as well as tramways. In their anti-socialism the German supporters of private ownership, like Emil Schiff, based much of their argument on opinions presented by the British Lord Avebury.⁹¹

Joint private and public companies (*Gemischt privat und öffentlichen Unternehmungen*) are business enterprises where the capital stock is shared by private entrepreneurs and the community both of which also jointly participate in the management of that particular enterprise. Although this type of enterprise had existed earlier it gained more importance only when it became common as a means of providing electricity and gas supplies and tramway systems.⁹² The model for this type of enterprise was taken from Rheinisch-Westfälische Elektrizitätswerk and later on many other enterprises adopted the same format

- by changing old private or public enterprises to jointly owned companies of the above type,
- by establishing new companies which were jointly owned as described above.

Passow's arguments sound quite convincing. The case of Essen for example demonstrates that it was possible to produce electricity cheaply. Rheinisch-Westfälische Elektrizitätswerk

90. Robert Haas, *Die Rückstellungen bei Elektrizitätswerken und Straßenbahnen. Ein Lehrbuch aus der Praxis für Betriebsverwaltungen, Ingenieure, Kaufleute und Studierende*, Berlin 1916, p. IV. Haas takes part in a fierce dispute — Passow and Rehn on one side and Schiff on the other — about the municipal, private or joint ownership of business enterprises. Emil Schiff, *Wertminderungen an Betriebsanlagen*, Berlin 1911.

91. Emil Schiff, *Unternehmungen oder Gemeindebetriebe*, Leipzig 1910.

92. Passow 1923, pp. 1—4.

AG. in Essen was launched with the capital collected by banks in Frankfurt am Main. The industrialists Hugo Stinnes and August Thyssen became shareholders when the capital of the company on April 1st 1900 was 2.5 million marks. In 1903 it was raised to 10 million marks and in 1912 the capital of the company had increased to 38 million marks. As a source of financing a huge number of bonds were issued. Besides, the company gained long term loans from the surrounding municipalities for building electricity lines and gas mains.⁹³

Passow argues for this type of enterprise in quite a modern way, for example by pointing out that technological and economic circumstances imply that the institutes and works are no longer limited to serving only the needs of one particular municipality, but that larger areas can also be serviced. Similarly the advantages of mass production must be seized because of the high costs of constructing for example a waterworks, in the case of which many investors and consumers are needed for the efficient establishment and use of plant; in other words the geographical area from which consumers are drawn should be large. Municipalities often preferred to negotiate with private enterprises rather than with other municipalities in particular because often there was a certain amount of conflict between large cities and neighbouring areas, and the smallest municipalities were suspicious of the actual intentions of their bigger neighbours. Passow draws attention also to the fact that the smaller municipalities did not have adequate technological knowledge. Nor in the jointly owned form of enterprise were municipalities loaded with huge debts. Because of long term concession agreements municipalities were often obliged to employ private or jointly owned companies, and as was mentioned earlier, it was easier for cities to act as guarantors for the loans of private entrepreneurs than to raise loans for themselves: "... zu letzterem brauchen sie überdies regelmässig keine staatliche Genehmigung, wie das bei Aufnahme eigene Anleihen der Fall ist".⁹⁴ In his article *Kommunal- und Privatbetrieb für Gas-, Wasser- und Elektrizitätswerke* published in the *Kommunale Rundschau* O. Smreker, a civil engineer from

93. Passow 1923, pp. 5—11.

94. Passow 1923, pp. 130—135.

Mannheim, pointed out that it was easier for private entrepreneurs to negotiate with people representing several municipalities than with the representatives of municipal enterprises in those cases where the activities of the enterprises were covering larger areas than one single municipality.⁹⁵

When comparing the discussion of municipal trading carried out in Germany with that in Great Britain or in the United States it is obvious that in Germany the principle of municipal ownership was no longer questioned at the turn of the century unlike in both of the Anglo-American countries. This may be due to the fact that positive experiences in the successful operations of municipal enterprises and even in municipal contract work (e.g. in Düsseldorf) were disseminated to every decision-maker in the German Empire and even beyond its boundaries through efficient statistical presentations, meetings of associations of towns and cities and the trade press as well as through exhibitions, a matter which is evident from the previous chapters and which will again be discussed later.

In England the crux of the matter can be found in the antithesis between the principles of self-help and state-help as was suggested in a booklet published by the Property Defence League. There some sceptics linked the concept of municipal ownership with socialism,⁹⁶ dubious being a foreign ideology, which in the 19th century was often confused with anarchist 'bomb throwing'. Others considered socialism a synonym for 'unlimited public expenditure'. In addition in England there was lacking such a tradition for joint ventures and joint enterprises, which were obvious in Germany from the Middle Ages onwards and from Nordic countries⁹⁷ at least from the 17th century onwards. In England even some roads were

95. O. Smreker, *Kommunal- und Privatbetrieb für Gas-, Wasser-, und Elektrizitätswerke*, *Kommunale Rundschau* 29.2.1908, pp. 167—171.

96. *Finer* 1945, p. 3.

97. See for example Eino Jutikkala, *Suomen talonpojan historia*, Helsinki 1958, pp. 218—219 concerning the duties of the local population to maintain roads and bridges and to build parish churches and vicarages. Later on this tradition expressed itself in the establishment of voluntary fire brigades in municipalities and in many cases they formed the social hub of the town. All this was naturally paving way for the adoption of the notion of joint, communal, municipal ventures and later on also for the acceptance of municipal enterprises as a natural phenomena.



Figure 9.

In Finland municipal ownership was never debated as strongly as in England. This may have been the result of an active interest in German developments in the field as well as the fact that traditionally roads and bridges were maintained communally. In Finland villages had commonly-owned grain larders as well for times of crisis. In the towns wells were among the first communal services providing free water. The photograph shows a communal well in the centre of Helsinki in 1869. The well was dug in 1838 and it first provided spring water and later mains water. (Photo: C. A. Hårdh, Collections of the Helsinki City Museum)

maintained by private individuals⁹⁸ and fire brigades were provided by private insurance companies. For long time the only public service was the police.⁹⁹

In Scotland it was possible to put even extensive municipalization projects into practice because of their particular form of municipal administration unlike in the

98. E. L. Hasluck, *Local Government in England*, Cambridge 1936, p. 26.

99. Hasluck 1936, pp. 254—255.

English or Welsh towns and cities where the tradition of local voluntary initiative was strong.¹⁰⁰

Because this principle of municipal ownership had been generally adopted in German cities in relation to many infrastructural services the models they provided, backed by the experiences gained in Glasgow and Birmingham, awoke considerable enthusiasm in British and American progressive circles.

In Finland there was very little public discussion on the municipal ownership outside the Social Democratic Circles. This may be partly due to the fact that during the period under review Finland faced a phase of acrimonious struggle over the use of native languages and the political pressure from the tsarist Russia.¹⁰¹

Only after the establishment of the Association of Finnish Cities in 1912 more attention was paid to the European, especially British and German discussion.¹⁰²

In Sweden the dispute about the municipal tramway system of Stockholm encouraged opponents to seek foreign examples for support of their standpoints. In connection of this debate the opinions of Lord Avebury came familiar not only to Swedish but also to Finnish public in large.¹⁰³

100. Derek Fraser, *The Evolution of the British Welfare State. A History of Social Policy since the Industrial Revolution*, London 1973, pp. 7—9.

101. Suomalaisen puolueen puoluekokous 12.—13.12.1899, 22.—24.10.1906 ja 28.—29.12.1909. Suomalaisen puolueen arkisto K 3. Nippu 1; Nuorsuomalaisen puolueen puoluekokous 6.—7.4.1906 ja 9.—10.12.1906 Nuorsuomalaisen puolueen arkisto 3, National Archives of Finland.

102. B. Vuolle, *Kuntien teknilliset liikeyritykset. Ensimmäisten kaupunkipäivien pöytäkirja*. Helsingissä 16. ja 17. p:nä syyskuuta 1912, Helsinki 1912, pp. 88—103; Georg Estlander, *Kuntien liikeyritykset ja osakeyhtiömuoto*. Suomen Kunnallislehti, Helsinki 1916/2; Otto Nikula, *Yksityisten yhtiöiden kuntainväliset liikeyritykset*. Yhteiskuntataloudellinen Aikakauskirja, Helsinki 1916, pp. 216—223.

103. Åbo Underrättelser 28.3., 31.3, 10.4, and 15.4.1915.

11. Development of Various Infrastructural Services

Some aspects of empirical analysis

The rapid urbanization which began during the second half of the 19th century presented a great challenge to large European cities. They had to look after the welfare of their inhabitants and not only did they have to provide them with basic services, such as water, food, lighting, heating and housing, health care and communications but they also had to arrange for their education and instruction. At a later stage they also appeared to pay more attention to leisure time and recreation services, which belong to the third category. Thus the cities became, in fact, the harbingers of the multifaceted process of modernization.

In an empirical analysis of the development of services I endeavour to observe this process at two levels:

- 1) at the intermediate level, by comparing services between different cities and various groups of cities;
- 2) at the international level by studying mainly the dissemination of new ideas related to services.

At both levels a strong emphasis is also placed on the assumption that cities together form a framework of reference for each other.

The first analysis compares how the cities differed from each other in respect of services. The problems investigated are:

- how and in which sectors the supply of services differed as between various types of cities
- whether it is possible to distinguish differences in the volume of services between cities at various stages of

growth, i.e. at the stages of take-off, accelerating growth and slackening growth.

For the analysis the *most representative variables* have been included from various services, i.e. from the infrastructure, health care, educational and leisure services, while those variables on which the data was most incomplete were rejected (see Appendix XIII).

In order to explore how quickly the volume and range of services were adapted to the growth of cities some selected services from different service sectors are observed in various types of cities. As mentioned already in chapter 6. attempts were made to classify cities into different categories. The following variables are employed to provide other useful *background information*:

- different types of cities (classification)
- the population of cities
- the rate of growth of cities
- the location of the city (east—west)
- the location of the city whether in Southern and South-Western Germany, the Ruhr area, Central Germany, North-Western or Eastern Germany
- the industrial structure of the city
- the income of the city (measured by daily wages)

In addition attention is to some extent also paid to the cities' traditions and their historical development as well as to their interactions and mutual rivalries. As a first hypothesis it is suggested that *the rivalry between cities can to some extent explain their policies on the development of services*.

The second approach to this subject is to analyse the development of services in an international framework. In the course of this attention is paid to the reference groups of cities and in particular to the spreading of service innovations from one country to the other — primarily between Great Britain, Germany and the Nordic countries. This relates to a further hypothesis *that identification with some model city could advance the development of services*.

William Harbutt Dawson noted in his *Municipal Life and Government in Germany*, published in 1914, that

"Germany has applied the principle of municipalization to economic undertakings upon a

far more extensive scale than any other country, and it has done this as the result not of any considered acceptance of economic theories, but of the force of tradition and still more of modern conditions”¹

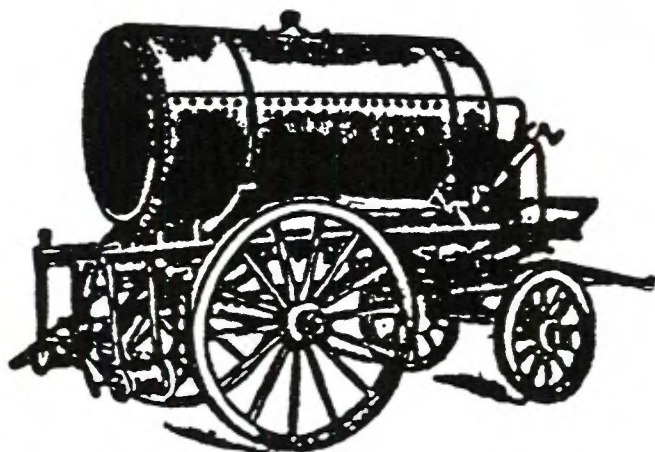
The German *Handwörterbuch der Kommunalwissenschaften* includes an interesting description by Fuchs of the establishment of municipal undertakings in a number of European countries. According to him the establishment of services in Germany after 1860 went through six different phases. The establishment of municipal waterworks, which were already operating in Britain at the beginning of the 19th century, marked the beginning of the first phase in post-1860 Germany. In the second phase, in the 1870's, Germany got its first slaughterhouses on the French model, whereas in Britain they were not established until ten or twenty years later. The third phase, during the 1880's and 1890's, was marked by the establishment of municipal gasworks in Germany whereas in Britain a few were already operating some twenty years earlier. The establishment of municipal electricity works both in Germany and in Britain took place from the 1880's and 1890's onwards forming the fourth phase and this development actually coincided with the fifth phase which saw the starting of the municipal tramway networks. The sixth phase was marked by the launching of municipal milk and food supplies as well as of a number of municipal enterprises, (e.g. ports, warehouses, mills). So far as municipal trading policy was concerned Germany and Britain differed in one respect at least: the municipalization of trams took place first in Britain and only later in Germany whereas the establishment of municipal electricity works was carried out in reverse order, first in Germany and then in Britain.²

Fuchs presents also an interesting analysis of *the speed of municipalization* in different German and British towns and cities. According to him the explanation of the rapid expansion in municipal activities in Germany can partly be found in the ancient rights for city self-government and the old established

1. Dawson 1914, p. 208.

2. Carl Johannes Fuchs, *Gemeindebetriebe*, in: *Handwörterbuch der Kommunalwissenschaften*, Bd. II, Jena 1922, pp. 242—243.

G. A. Händel
Königliche Sächsishe Feuerspritzenfabrik
Dresden-A.



Abteilung Strassenreinigungsmaschinen.
Sprengwagen
in 5 verschiedenen Konstruktionen
Kehrmaschinen
Illustr. Prospekte sofort franko.

Figure 10.

Street cleaning was part of the development of public hygiene. An advertisement for a street cleaning wagon in the Städte-Zeitung.



Figure 11.
Street cleaning equipment of the city of Helsinki in the 1910s.
(Collections of the Helsinki City Museum)

practices of civic economy in that country. For a long time past German towns and cities had possessed, for example sandpits and quarries (Sand- und Steingruben), stables (Marstall) and transport services (Fuhrwesen). Not only was the development of municipal activities speeded up by this tradition of municipal ownership but also by the availability of high class officials. Indeed, Fuchs maintains that German municipal enterprises were the productions of municipal bureaucrats whereas in Britain they were mainly created by individual merchants and manufacturers. Thus the excellent body of German civic officials carried out tasks which were left unattended to by the industrial and commercial circles of that country.³

The systematization by Fuchs illustrates well one of the most frequently employed way of studying the origins of services i.e. scrutinizing the order of their establishment. Another, quite

3. Ibid pp. 244—247.

common method is *to evaluate services according to the profits* they had yielded or would produce. So for example in an article, mentioned above, by Fr. W. Schirmer about debts in German cities, published in the *Städte-Zeitung*, the debt incurred by various German cities were compared in relation to their respective service provision.⁴

In 1912 W. H. Harland, an Englishman, expressed the following opinion on the profitability of municipal trading:

"Municipal trading enterprises can be divided into three classes — those that nearly always show a surplus, those that almost invariably record a deficit, and those that fluctuate between a profit and a loss. Into the first go electricity works, gas works, tramways, markets, allotments and telephones... into second, baths and washhouses, cemeteries, harbours and docks, slaughter-houses and water works; and into the third workmen's dwellings."

The non-paying enterprises — baths and wash-houses and waterworks — also furnish convenient public services, but as regards most of them use was compulsory or desirable and charges therefore had to be fixed on a basis to suit the general need. Baths and washhouses never exhibited even a trading profit in only one year out of the ten. The deficit on the former ranged from £132,400 to £435,200, the annual mean being £308,900 equal to 12 per cent on capital. These were the worst examples of the nonmunerative class, the comparative loss on harbours and docks, slaughterhouses and waterworks being small.⁵

The third point of departure often employed is to compare the *basis of the ownership of services*, such as the percentage of shares owned by the city in water, gas or electricity works, and the profits these enterprises yielded. Once municipal ownership had become commonplace and information on the work force employed by municipal enterprises became available researchers also began to be interested in comparing the status,

4. W. Schirmer, Das Anleihewesen der deutschen Großstädte, Städte-Zeitung 22.11.1907, pp. 96—98.

5. W. H. Harland, Municipal Trading Results, The Local Government Review 2/1912, Vol V, p. 49—51.

Table 16.

Articles published in the *Technisches Gemeindeblatt* between 1898/99—1905/06 discussing the practical applications of urban technology.

Year	1898/99		1899/00		1900/01		1901/02		1902/03		1903/04		1904/05		1905/06	
Variable	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%	abs.	%
Transport	1	2	1	2	1	3	2	7	6	12	3	5	2	7	3	8
Lighting and heating	0	0	0	0	2	5	0	0	0	0	0	0	0	0	0	0
Energy production	3	7	5	11	2	5	0	0	0	0	0	0	2	7	2	5
Fire fighting	3	7	0	0	0	0	2	7	1	2	1	2	3	11	0	0
Construction technology	8	18	13	29	8	21	6	21	4	8	15	27	9	32	7	17
Public sanitation	8	18	11	24	5	13	5	18	7	14	8	15	7	25	5	12
General hygiene	8	18	7	16	6	16	3	11	6	12	3	5	0	0	2	5
Water supply	14	30	8	18	14	37	10	36	27	53	25	45	5	18	21	53
LAST 3																
TOGETHER	30	66	26	58	25	66	18	65	40	79	36	65	12	43	28	70
TOTAL	45	100	45	100	38	100	28	100	51	101	55	99	28	100	40	100

Table 17.

Articles published in the *Städte-Zeitung* between 1903/04—1906/07 discussing the practical applications of urban technology.

Year	1903/04		1904/05		1905/06		1906/07	
Variable	abs.	%	abs.	%	abs.	%	abs.	%
Transport	3	5	2	4	6	11	2	5
Lighting and heating	4	6	5	9	2	4	2	5
Energy production	8	12	5	9	5	9	2	5
Fire fighting	5	8	7	13	2	4	4	9
Construction technology	17	26	9	17	8	15	9	20
Public sanitation	12	18	7	13	9	16	6	14
General hygiene	2	3	0	0	6	11	6	14
Water supply	15	23	18	34	17	31	13	30
LAST 3								
TOGETHER	29	49	25	47	32	58	25	58
TOTAL	66	101	53	99	55	101	44	102

Source: Based on Jaakko Pöyhönen's analysis of the content of articles.

salaries and wages as well as the working conditions of city employees with those of other occupational groups.⁶

An interesting approach to the question of infrastructural services which at the same time indicates the areas considered to be in need of most urgent attention is provided by articles published in the *Städte-Zeitung* and the *Technisches Gemeindeblatt*. Tables 16. and 17., which are based on a content analysis of articles in both periodicals at the turn of the century, clearly demonstrate the concern municipal planners of large cities felt towards water supply and sewerage and later also to refuse collection as well as public hygiene in general.

Both the *Technisches Gemeindeblatt* and the *Städte-Zeitung* were, due to their specialist nature, mainly oriented to dealing with matters relating to construction engineering. At the period of this study more than 20 per cent of articles in both journals discussed these topics even if the overwhelming majority of the pieces were written about matters related to supply and quality of water. The discussion of filtration of water was also at its peak at that time. Efforts to ensure clean drinking water were connected with the battle against infectious diseases. All in all along with the pieces discussing water supply the writings dealing with cleansing and public hygiene formed approximately half of all the articles actually published in the *Technisches Gemeindeblatt* in 1898—1906 and in the *Städte-Zeitung* in 1903—1907.

The results presented above point in the same direction as the results noted by Christian Engeli in his study of issues presented at the regional meetings of the associations of towns and cities in Germany. According to Engeli during the period 1900—1914 town planning and housing questions were already much more frequently discussed at those meetings than issues relating to social welfare and health care which had been considered important in the closing years of the 19th century.⁷

The development of infrastructural services follows a certain hierarchy of needs. When roughly comparing the growth rate of various services it can be concluded that, when measured by length, roads, streets and railways were largely complete by the

6. Dawson 1914, pp. 256—259.

7. Engeli 1980, p. 184.

beginning of the research period, for the scale of their construction grew significantly only in the most industrialized cities, the average growth in the research period being a mere 8 per cent. During the same period the cities increased their network of water mains by 47 per cent and the supply of gas by 40 per cent when measured by the length of gas mains. When assessing these figures it is worth bearing in mind, however, that the increase in the number of floors in town houses reduces the need to extend the networks of gas, electricity, water mains and sewers. By far the greatest growth occurred, nevertheless, in the tramway system, which increased by 126 per cent.

Table 18.

Development of certain infrastructural services in 44 German cities, average per 100,000 inhabitant.

	1890	1900	1910	1890—1910 increase per cent
Roads, streets, railways (ha)	233	228	252	8
Gas mains (km)	75	81	104	40
Water mains (km)	77	96	113	47
Sewerage (km)	47	64	82	75
Tramways (km)	16	31	36	126

Sources: Statistisches Jahrbuch Deutscher Städte Jg. 2, p. 90; Jg. 11, p. 466; Jg. 19, pp. 570—573.

The growth of nearly all infrastructural services is generally associated with industrialization and, indeed, the rate of construction of tramways, sewerage and drainage systems as well as of gasworks was fastest in the most industrialized cities. Investigating further in which size of cities the growth of infrastructural services took place most quickly, it can be concluded that it was at its most rapid, for example in the case of tramways, in the cities with 100,000—200,000 inhabitants.

Water supply and sewerage

The development of water supply and the sewerage systems belongs to the history of modern urban hygiene, being, the two most important aspects of the age in urban sanitation. Similarly they can be considered to belong among the biggest technical and social achievements of the time.⁸

Of the modern researchers interested in these matters John von Simson analyses particularly well the reasons for the development of urban hygiene in the great European capitals, Berlin, London and Paris. According to him the biggest problem in the 19th century, in relation to water supply and sewerage turned out to be sewage disposal, for the main bulk of rubbish was got rid of by simply dumping it into the gutters.⁹ By 1850 only a few towns had yet constructed a sewerage system and rain water mixed with animal excrement and all kinds of household rubbish and other wastes were allowed to flow in the gutters. Therefore it was hardly surprising that in the 1840's the question of public hygiene had become an issue of lively public debate in the fast expanding European cities.¹⁰

The immediate cause of this increased interest in urban hygiene can be traced to the five cholera epidemics during the first half of the 19th century, which were observed to spread particularly rapidly in those towns and cities with an imperfect or no system of drinking water inspection. The second, underlying reason was demographic development during the early decades of the 19th century, as a result of which a number of cities, and Paris, London and Berlin among them, witnessed the doubling of their total population between 1800 and 1850. It proved to be a very difficult task to supply the rapidly growing population with water from wells, especially because the river water in many cities was becoming increasingly polluted as a result of the advance of urbanization and industrialization. In addition the new factories

8. Briggs 1975, p. 17.

9. John von Simson, *Water Supply and Sewerage in Berlin, London and Paris*, in: Hans Jürgen Teuteberg (ed.), *Urbanisierung im 19. und 20. Jahrhundert. Historische und geographische Aspekte*, Cologne 1983, pp. 429—439.

10. v. Simson 1983, p. 429.

substantially increased the demand for soft water for their production processes. As the third reason for the increased awareness of sanitary problems Simson mentions the public health movement in Great Britain¹¹ and one might add as the fourth reason for the urgent construction of public water mains the increasing urgency which was felt, particularly in the Nordic countries, over the need to improve fire prevention measures. Indeed, in the North, where the main stock of townhouses were built of timber, this seems to have been one of the main reasons for the establishment of public water systems and it was used for example in Stockholm¹² and in Helsinki¹³ as the main argument during debate in support of various plans for constructing municipal water systems.

In Britain the *Sanitary Report on the Fifty Largest Towns* by Edwin Chadwick in 1842 discussed sanitary matters condemning strongly all private enterprise in this area, an opinion which was often repeated in later reports during the 1840's. According to Chadwick ill health was one of the most important causes of destitution and pauperism which also cost taxpayers' money and he pointed out that an improved water supply was absolutely necessary. In addition only by adopting a system of swift removal of all waste products from urban areas, could the sanitary conditions of the working classes be substantially improved.¹⁴

After several severe cholera epidemics in Great Britain blocks of infected dwellings were demolished in many towns and the construction of a public sewerage system was begun in the mid 19th century. A new method of disposing of sewage was also employed by conducting it to fields for fertilizing soil and by 1870 all the largest British towns had allocated special fields for this purpose.¹⁵

11. v. Simson 1983, pp. 430—432.

12. Betänkande af Herr Lejonancker från 17. Juni 1853, quoted: Stockholms vattenledning, in: Tidskrift för Byggnadskonst och ingenjörvetenskap utgifven af G. Nerman och A. W. Edelswärd. 4. årgång 1862, p. 5.

13. Jorma Kallenautio, Kunnallistalous, yhdyskuntatekniikka, liikelaitokset ja joukkoliikenne 1875—1917, in: Suomen kaupunkilaitoksen historia 2, Vantaa 1983, pp. 311—312.

14. Edwin Chadwick, *Report on the Sanitary Condition of the Labouring Population in Great Britain* (1842), reprinted, Edinburgh 1965.

15. Krabbe 1985, p. 32.

The history of urban hygiene in Paris starts with the memorandum by Georges Haussman in 1854 in which he strongly advocated the establishment of a dual water supply system for the city. The perennial problem, the removal of night-soil, he proposed to solve by constructing a subterranean refuse-collecting system.¹⁶

These proposals in Britain and France for dealing with sewage waste were based on the idea of continuing the natural interaction between cities and countryside, advocated by the famous German agricultural chemist, Justus von Liebig in Berlin. According to Liebig the use of night-soil as a fertilizer was essential for the growth of national strength, because he considered that increases and decreases in population were dependent on the fertility of soil. Consequently Liebig's theories remained an issue of lively debate until the beginning of the First World War.¹⁷

So far as the water supply and sewerage were concerned at first Britain and France were the two model countries. In 1847, the legislation was amended in Britain so that municipalities were from then onwards allowed to establish their own waterworks or to transfer private water companies to municipal ownership.¹⁸ This greater experience was acknowledged also in Berlin when a Prussian engineer, Eduard Wiebe, was sent by the Prussian authorities to Paris and London, after bad experiences of the private waterworks established in Berlin in 1852, to study the sanitary methods used there. In his report of 1862 Wiebe proposed the establishment of a combined water carriage system to Berlin. Later, amid the advancing pollution of the major German rivers, cities in the most western parts of Germany and in Holland were forced to consider new methods of obtaining

16. According to Haussmann one idea for a subterranean scavenger system envisaged that the cesspools of every house in Paris could be made accessible by a passageway large enough for workers to pass through. These passageways would be connected to the public sewers through which labourers could push carts loaded with nightsoil to largest sewers. In these, tracks might be laid so that a subterranean railway system could be used to transport the waste products to the countryside to be used as a fertilizer. Described in v. Simson 1983, pp. 436—437.

17. v. Simson 1983, p. 438.

18. Kallenautio 1983, p. 312.

fresh water: it was necessary either to develop more efficient filters for the utilization of surface water or to use ground water instead. Consequently, in the 1880's the study tours from the Nordic cities (Helsinki and Stockholm) were directed both to cities using ground water, such as Barmen, Frankfurt am Main, Leipzig and Utrecht and to those utilizing surface water, like Altona, Hamburg and Berlin. In 1889 the head of the Helsinki Waterworks, C. Hausen, submitted a report of almost 600 pages on one of these fact finding tours to waterworks in Swedish, German, Dutch, British and Belgian cities¹⁹ (see Map 1).

Partly due to these foreign influences the prospects of using ground water began to be explored in Helsinki at the beginning of the 20th century. Simultaneously attempts were made to follow closely the developments of surface water purification methods and to carry on local tests using both physical and chemical purification methods.²⁰

For the establishment of a sewerage system a special municipal commission was appointed in Germany and after years of deliberation under the chairmanship of Rudolf Virchow, a distinguished scientist and politician, it recommended the plan of James Hobrecht, a German engineer whose socio-political ideas closely matched those of Chadwick. Hobrecht's plan consisted of the establishment of a combined water-carriage system, the dividing up of the municipality into smaller drainage areas and the pumping of the sewage to numerous sewage farms located around the city. Work on the project was begun on these lines in 1873. Almost simultaneously, plans were made for a new, municipally owned water supply.²¹

Officials of the Nordic countries also recognized early on the importance of these matters. Already in 1876 the Municipal Engineer of Helsinki, Reuter, had applied for funds from the

19. Helsingfors Stadsfullmäktiges tryckta handlingar för 1902, n:o 22, Handlingar rörande frågan om vattenledningsvattnets rening; n:o 34, Förslag till aflagringsbassiner för Vandaåvattnets rening; n:o 36, Handlingar rörande frågan om aflagringsbassiner för Vandaåvattnets rening; Helsingin kaupunginvaltuuston painetut asiakirjat 1908, n:o 8.

20. Waller 1983, p. 301.

21. v. Simson 1983, pp. 438—439.

City Council in order to explore sewerage systems in different countries²² and two years later, in 1878, Th. Tallquist completed a plan for the construction of a sewerage system in Helsinki on the scale common elsewhere in Europe even though the population of Helsinki at that time was a mere 40 000 people.²³

Water works were rapidly established in the largest cities of Great Britain and Germany the reason given being most often the sanitary one, but the English in particular were unwilling to emphasize the remunerative aspects of these municipal undertakings. As a result in Britain, by 1871, 250 of 783 urban districts provided some water supply, while eight years later, in 1879, 413 of 944 urban districts were doing so with 290 being supplied by companies. Only 241 urban districts were then without any piped water supply and generally these were smallish towns. But it was not until the late 1890's that a domestic water supply became practically universal in towns and cities. By 1914 in England two-thirds of the population were supplied by a public authority: by that time 51 county boroughs, 151 municipal boroughs and 298 urban districts managed their own waterworks.²⁴

The Germans on the other hand considered waterworks as typical potentially profitable municipal enterprises, the establishment of which could be argued on sanitary grounds.²⁵ Besides it was commonly observed that the price of water went down when the city/commune took over the waterworks or established its own.²⁶

In Imperial Germany 47 per cent of towns with 2,000—25,000 inhabitants had a network of watermains at the turn of the century. While all towns and cities over 25,000 inhabitants had a network of watermains.²⁷ German cities with a population of 5,000—20,000 had some kind of water system it was still absent in half of the rural communes.²⁷

22. Berättelse angående Helsingfors stads kommunalförvaltning 1875—1878, p. 172.

23. Ibid, p. 360.

24. Waller 1983, pp. 301—303.

25. Mombert 1908, pp. 11—12.

26. Carl Johannes Fuchs 1922, p. 243.

27. E. Grahn, Die Städtischen Wasserwerke, in: Die deutschen Städte, Robert Wuttke, (ed.) Bd. I, Leipzig 1904, p. 309.

The differences between towns and cities were even greater. In 1900 all Prussian cities with more than 25,000 inhabitants had a water system whereas of those with less than 25,000 inhabitants only 38 per cent had a network of water mains. Similarly the situation in the east was substantially different from that in the west: in the small towns of Eastern Prussia only 4 per cent had a water system whereas in the Rhineland areas 76 per cent of comparably sized towns had their own network of water mains.²⁸

The differences between large cities, small towns and rural communes were, if possible, even greater so far as sewerage systems were concerned. The smaller the commune's total population the less common also was a sewerage system. So for example by 1907 all cities with more than 100,000 inhabitants had established a sewerage system but it existed in a mere 1 per cent of communes with a population of less than 2000.²⁹

Pointers to the necessity of constructing sewerage systems in Germany were given not only by the surveys conducted by Petenkofer and Koch but also by the severe cholera epidemic which occurred in Munich in 1854—55. The beneficial consequences of the establishment of a system there in 1872 emerged quite quickly: whereas mortality in Munich had been 40.4 per thousand in 1872 it declined considerably during the following two decades, being only 26.6 per thousand in 1892. The city of Hamburg had got its sewerage system somewhat earlier, in 1868, and it was constructed following the plans of an Englishman, William Lindley. This example was later followed by the cities of Berlin, Danzig and Breslau.³⁰

In many cases it is, however, rather difficult to define accurately the actual time of construction of the sewerage system, because in many German towns some kind of system had been already operating and was merely modernized at the end of the 19th century. This process could, however, be a lengthy one, for example the renovation of the sewerage system in Düsseldorf took two decades, from 1889 to 1909. Some researchers have pointed out that the establishment of a modern sewerage system was delayed until the 1870's because

28. Grahn 1904, p. 309.

29. Matzerath 1985, p. 339.

30. Krabbe 1985, pp. 31—35.

of the lack of know-how in Germany concerning the 'deep construction' methods essential for the construction of the modern underground network of sewers. But once started the process was rapid indeed: the 1880's already saw the establishment of a system of sewers in a number of large industrial cities, first in Essen and then in Dortmund and Breslau, and their example was followed by cities in the Ruhr and Rhineland areas, like Cologne, Düsseldorf, Frankfurt am Main and Elberfeld.³¹ Thus it emerges that the large commercial and industrial centres of western Germany again proved to be the pioneers in applying the achievements of modern technology to urban circumstances.

What are the differences between the various cities of this study so far as waterworks were concerned?

As Table 19. demonstrates there was a clear tendency among the largest cities to begin the *establishment of municipal enterprises* by first constructing their own waterworks. Of the 44 German cities dealt with in this study 17 were already provided with a water system before 1870. The following decade saw the establishment of such a system in 22 other towns, and of the remaining 5 cities Aachen, Barmen, Kiel, Mannheim and Munich got their water system in the 1880's. Most of these waterworks were owned by the municipalities even if it is not clear on the basis of the sources available in which cases the waterworks originally belonged to the city and in which cases they were transferred only later from their private owners to the municipality. From the table it also emerges clearly that the waterworks were the most common type of municipal enterprise. In 1900 for example of 846 German towns and cities with a centralized water supply system only 8 per cent, did not have their own municipal waterworks.³²

It was the city of Hamburg which first followed the British example by establishing such a waterworks in 1849. Berlin and Würzburg constructed their works next, in 1856, followed by Altona, Frankfurt a.M., Magdeburg and Mulhouse (1859), Mainz (1863), Essen (1864), Brunswick, Metz and Posen (1865), Stettin and Leipzig (1866), Lübeck (1867), Halle (1868) and

31. Reulecke 1985, pp. 58—59; Krabbe 1985, p. 31.

32. Grahn 1904, p. 311; Blaum 1931, p. 492.

Table 19.

The years of foundation of some infrastructural services in 44 German cities.

City	Tram-ways	Water-works	Gas-works	Elec- tricity works	Elec- trified tramways
Aachen	1880	1880	1838	1893	1895
Altona	1878	1859	1858	1892	1896
Augsburg	1876	1879	1847	1902	1898
Barmen	1874	1883	1846	1888	1894
Berlin	1865	1856	1826	1885	1895
Bremen	1876	1873	1854	1893	1892
Breslau	1877	1871	1847	1891	1893
Brunswick	1881	1865	1852	1900	1897
Cassel	1877	1873	1851	1891	1900
Chemnitz	1880	1875	..	1894	1893
Cologne	1877	1872	1840	1891	..
Crefeld	1883	1877	1853	1899	..
Danzig	1873	1869	1853	1898	1896
Dortmund	1881	1872	1857	1897	1894
Dresden	1872	1875	1828	1895	1893
Düsseldorf	1876	1870	1846	1891	1896
Elberfeld	1874	1879	1837	1887	1896
Erfurt	1883	1876	..	1901	1894
Essen	1894	1864	1856	1898	1893
Frankf. a.M.	1872	1859	1828	1894	1884
Frank. a.O.	1898	1874	1854	..	1898
Görlitz	1882	1875	1854	1896	1897
Halle	1882	1868	1856	1900	1891
Hamburg	1866	1849	..	1888	1894
Hanover	1872	1878	1826	1891	1893
Karlsruhe	1877	1871	1846	1892	1898
Kiel	1881	1880	1887	1901	1896
Königsberg	1881	1874	1852	1890	1895
Leipzig	1872	1866	1838	1895	1896
Lübeck	1881	1867	..	1887	1894
Magdeburg	1877	1859	1853	1896	1899
Mainz	1883	1863	1847	1898	1904
Mannheim	1878	1888	1851	1899	1900
Metz	1876	1865	..	1885	..
Mulhouse	1885	1859	..	1888	1894
Munich	1876	1883	1850	1893	1895
Nuremberg	1881	1871	1847	1896	1896
Posen	1880	1865	1856	1894	1898
Potsdam	1880	1876	1855	1902	..
Stettin	1879	1866	1848	1889	1897
Strasbourg	1878	1879	1840	1895	1895
Stuttgart	1868	1876	1845	1895	1895
Wiesbaden	1875	1871	1847	1898	1896
Würzburg	..	1856	1855	1899	..

Sources: Heinrich Silbergleit (ed.), *Preussens Städte*, Berlin 1908, pp. 234—235, 237, 238, 239, 240; *Statistisches Jahrbuch Deutscher Städte*, Jg. 1., pp. 133, 237; Jg. 2, pp. 140, 357; Jg. 5, p. 323. Jg. 6, p. 281; Jg. 8, pp. 92—93; Jg. 9, pp. 73—74; Erich Keyser (ed.), *Deutsches Städtebuch* (several volumes); E. Grahn, *Die städtischen Wasserwerke*, in: Robert Wuttke (ed.), *Die deutschen Städte*, Bd. I, Leipzig 1904, pp. 310, 318—338; C. Höffner, *Die Gaswerke*, in: Robert Wuttke (ed.), *Die deutschen Städte*, Bd. I, Leipzig 1904, pp. 198—199; *Elektrotechnische Zeitschrift* 16.4.1907.

.. valid data not found

Danzig (1869). Table 19. also shows that the spread of the water system took place quite evenly across the country. It is also very difficult to discern any differences between various types of cities unless one considers it as significant that the commercial cities and the old Hanseatic towns were slightly ahead of the others so far as the establishment of waterworks was concerned.

It is, however, worth bearing in mind, that the order of establishment does not necessarily have any great value as a guide to the importance placed on water matters by the authorities or on the actual time schedule of related activities. So for example the Southern German states of Bavaria, Baden and Württemberg established their own organization for the development of a water supply and sewerage even though their cities, with the sole exception of Würzburg, constructed their waterworks later than the cities in Northern Germany. The main task of this organization was to plan and to supervise the construction of public water main systems. Again in Prussia a decree of 1899 stipulated that District Medical Officers should act as health inspectors responsible also for the inspection of water. In addition a special institution was established for the inspection of water main systems and sewerages (*Staatsanstalt für Zwecke der Wasserversorgung und Abwasserbeseitigung*).³³

As in the case of many other infrastructural services the genesis of water systems at a certain period was also affected not only by the active involvement and know-how of British companies, much in evidence especially in the early stages of some of the developments already mentioned above, but also by the active interest shown by the decision-makers of the city.³⁴

Krabbe in particular is interested in investigating the initiatives leading to the establishment of different waterworks and is fully convinced of the decisive impact on further developments of the active role played by town Councils. When for example the Council of Magdeburg learned about the plans of Oberbaurat Moore in Berlin, they immediately invited him to submit a plan also for the construction of waterworks in Magdeburg while in Frankfurt am Main and in Leipzig the original initiative also came from the City Councils. Essen

33. Krabbe 1985, pp. 28—29.

34. Grahn 1904, p. 312.

provides an exception, for there the initiative came from industrial circles and they also provided the necessary starting capital.³⁵

At the turn of the century all the towns and cities included in this study already had a system of water mains fully in operation. Therefore it is possible to investigate whether there were any differences between cities so far as the consumption of water was concerned this being frequently employed by researchers as an indicator of the standard of living, and, together with the rate of infant mortality, it has also been used as a measure of the general level of development in a particular area.³⁶

In 1912 the *consumption of water per inhabitant* in the 44 German cities was on average 121.9 litres a day. This figure was more than doubled in Augsburg (265.2 l) and the amount of 200 litres was exceeded also in Dortmund (238.5 l), Munich (229.4 l), Metz (207 l) and Würzburg (203.7 l). Water consumption was greatest in the cities of the west and the south as well as in the textile cities where water was needed for production processes, but also some wealthy commercial cities (Frankfurt am Main, Cologne, Altona, Hamburg, Lübeck) as well as the multidimensional Düsseldorf were quite big water consumers not to mention the cities of Dortmund, Essen and other metal cities. (see Appendix VIII). The smallest amount of water per capita was used in the cities of the east, i.e. in Chemnitz, Stettin, Leipzig, Königsberg, Danzig, Erfurt, Potsdam, Görlitz and Halle. This group at small consumers also included, however, the western garrison cities of Kiel and Mainz (see Tables 20. and 21.).

In the following *step-wise regression analysis* was applied in order to explain how various background variables affected the development of different services.

The principle of step-wise regression analysis is to provide the greatest possible degree of explanation with the least possible number of valid variables. The model selects at each step the independent variable with the greatest partial correlation with the dependent variable. In other words the

35. Krabbe 1985, pp. 28—29.

36. Dawson 1914, p. 232.

Table 20.

Water consumption per inhabitant (litres/day) in German cities according to the applied classification in 1890, 1896, 1900, 1905, 1910 and 1912.

	Commer- cial Cities	Adminis- trative Cities	Metal Industry Cities	Textile Industry Cities	Garrison Cities	Regional Centres	On Average	Tail prob- ability ¹	(N) ²
Consumption of water per inha- bitant (litres/day)									
1890	136.0	74.7	90.3	103.1	60.6	71.8	88.8	0.108	(42)
1896	134.1	93.1	103.9	138.3	72.9	69.3	100.1	0.108	(40)
1900	141.2	97.7	114.9	149.6	72.4	88.9	109.5	0.173	(42)
1905	135.1	103.9	120.9	137.8	84.7	94.1	112.5	0.318	(43)
1910	137.4	107.2	127.4	150.4	97.6	100.0	118.7	0.336	(43)
1912	132.8	112.8	137.0	152.8	105.9	101.9	121.9	0.499	(44)

Sources: Calculated on the basis of Statistisches Jahrbuch Deutscher Städte, Jg. 2, pp. 90–91; Jg. 7, pp. 77,81; Jg. 11, pp. 466–467; Jg. 15, p. 535; Jg. 19, pp. 574–577; Jg. 21, pp. 435–437.

Applied classification:

Commercial Cities: Altona, Bremen, Cologne, Frankfurt a.M., Hamburg, Leipzig, Lübeck

Administrative Cities: Berlin, Brunswick, Breslau, Cassel, Dresden, Hanover, Karlsruhe, Königsberg, Magdeburg, Munich, Strasbourg, Stuttgart

Metal Industry and Mining Cities: Chemnitz, Dortmund, Düsseldorf, Essen, Mannheim, Nuremberg

Textile Industry Cities: Aachen, Augsburg, Barmen, Crefeld, Elberfeld, Mulhouse

Garrison Cities: Kiel, Mainz, Metz, Potsdam

Regional Centres: Danzig, Erfurt, Frankfurt a.O., Görlitz, Halle, Posen, Stettin, Wiesbaden, Würzburg

1 Equality of group means was tested with one-way analysis of variance which indicate whether the means of city groups into which the material was divided are significantly different from each other. Differences between the city groups are significant in cases where the tail probability approaches zero. For example in the year 1890 consumption of water per capita was in commercial cities (the greatest value) over 100 per cent higher than in garrison cities (the lowest value). In the year 1912 consumption was 50 per cent higher in textile cities than in regional centres. Accordingly tail probability was low (0.1) in 1890 and greater in 1912 (~ 0.5).

2 Missing: 1890: Mulhouse, Stettin

1896: Danzig, Elberfeld, Mulhouse, Würzburg

1900: Frankfurt a.O., Mulhouse

1905: Frankfurt a.O.

1910: Frankfurt a.O.

Obs: Data concerning either calendar year or fiscal year.

Table 21.

Water consumption per inhabitant (litres/day) in German cities grouped according to geographical location in 1890, 1896, 1900, 1905, 1910 and 1912.

	In the Ruhr area	In Southern and South Western Germany	In North- Western Germany	In Central Germany	In Eastern Germany	On Average	Tail probability	(N) ¹
Consumption of water per inhabitant (litres/day)	1890 106.1 1896 120.5 1900 138.6 1905 138.0 1910 151.8 1912 157.2	95.7 116.5 130.1 136.1 142.0 148.1	105.2 114.9 117.8 116.7 116.9 114.6	65.4 66.8 71.4 73.8 81.1 83.1	61.1 71.3 69.4 73.2 76.8 85.5	88.8 100.1 109.5 112.5 118.7 121.9	0.165 0.064 0.011 0.002 0.0004 0.0002	(42) (40) (42) (43) (43) (44)

Sources: Calculated on the basis of Statistisches Jahrbuch Deutscher Städte, Jg. 2, pp. 90—91; Jg. 7, pp. 77, 81; Jg. 11, pp. 466—467; Jg. 15, p. 535; Jg. 19, pp. 574—577; Jg. 21, pp. 435—437.

Geographical location of the city:

In the Ruhr area: Aachen, Barmen, Cologne, Crefeld, Dortmund, Düsseldorf, Elberfeld, Essen

In Southern and South-Western Germany: Augsburg, Frankfurt a.M., Karlsruhe, Mainz, Mannheim, Metz, Mulhouse, Munich,

In North-Western Germany: Altona, Brunswick, Bremen, Cassel, Hamburg, Hanover, Kiel, Lübeck

In Central Germany: Berlin, Chemnitz, Dresden, Erfurt, Halle, Leipzig, Magdeburg, Potsdam

In Eastern Germany: Breslau, Danzig, Frankfurt a.O., Görlitz, Königsberg, Posen, Stettin

¹ Missing 1890: Mulhouse, Stettin

1896: Danzig, Elberfeld, Mulhouse, Würzburg

1900: Frankfurt a.O., Mulhouse

1905: Frankfurt a.O.

1910: Frankfurt a.O.

Obs. Data concerning either calendar year or fiscal year.

Table 22.

Length of water mains (metres/100 inhabitants) in German cities according to the applied classification in 1890, 1900 and 1910.

	Commer- cial		Adminis- trative		Metal Industry		Textile Industry		Garrison Cities		Regional Centres		On Average		Tail pro- bability	(N) ¹
	Cities		Cities		Cities		Cities		Cities		Cities					
Length of water- mains (metres/100 inhabitants)	1890	81.5	64.5		97.8		81.1		68.9		71.9		75.9		0.181	(40)
	1900	109.4	84.7		102.2		122.2		80.4		89.7		96.3		0.255	(42)
	1910	121.6	101.3		113.2		125.9		117.7		111.5		113.1		0.613	(44)

Sources: Calculated on the basis of Statistisches Jahrbuch Deutscher Städte, Jg. 2, p. 90; Jg. 11, p. 466; Jg. 19, pp. 570—573.

Applied classification:

Commercial Cities: Altona, Bremen, Cologne, Frankfurt a.M., Hamburg, Leipzig, Lübeck

Administrative Cities: Berlin, Brunswick, Breslau, Cassel, Dresden, Hanover, Karlsruhe, Königsberg, Magdeburg, Munich, Strasbourg, Stuttgart

Metal Industry and Mining Cities: Chemnitz, Dortmund, Düsseldorf, Essen, Mannheim, Nuremberg

Textile Industry Cities: Aachen, Augsburg, Barmen, Crefeld, Elberfeld, Mulhouse

Garrison Cities: Kiel, Mainz, Metz, Potsdam

Regional Centres: Danzig, Erfurt, Frankfurt a.O., Görlitz, Halle, Posen, Stettin, Wiesbaden, Würzburg

1 Missing: 1890: Elberfeld, Mulhouse, Stettin, Würzburg

1900: Frankfurt a.O., Mulhouse

result is (statistically) the best combination of all available variables.

When applying step-wise regression analysis in investigating *water consumption per inhabitant* it was observed that water consumption was best explained by the dummy variables of geographical location of the cities. In model number 1 (Appendix IX) the only acceptable variable was location in the eastern part of the country (the dummy variable has the value 1 if the city is located in the eastern part of Germany, otherwise the value is zero). This dummy variable of area explained 30 per cent of the total variance of water consumption ($R^2 = .30$).

The analysis was further developed by replacing the independent dummy variable of east — west with the more precise dummy variables of geographical location (i.e. cities of Southern and South-Western Germany, the Ruhr area, Central Germany, North-Western and Eastern Germany). In this model the best variables proved to be location in the Ruhr area or in Southern and South-Western Germany; $R^2 = .33$ (see Appendix IX, model 2). This can, perhaps, be explained, not only by the need for water in the metal and textile industries as noted above, but also by the interdependence of the Southern and South-Western German cities and their mutual frames of reference.

When comparing *the length of water mains per inhabitant* in various types of cities the former picture based on water consumption remains unaltered. The length of mains per capita was clearly greater in the commercial, textile and metal cities even if the differences were evening out during the first decade of the 20th century (see Table 22.). On the other hand the main differences between cities located in Eastern and Central Germany and cities located in the Ruhr area, Southern and South-Western Germany and North-Western Germany did not appreciably change in the period 1890—1910 (see Table 23.).

If we compare, on the basis of figures given in the Comparative Municipal Statistics, the water consumption of German cities with that of English, Welsh, Scottish and Irish cities it is obvious that water was used somewhat more abundantly in London (159.3 l), Leeds (154.1 l), Liverpool (158.7 l), Manchester (153.9 l) and Newcastle (146.0 l) than in German cities whereas the figures relating to Birmingham

Table 23.
Length of watermains (metres/100 inhabitants) in German cities grouped according to geographical location in 1890, 1900 and 1910.

Length of water- mains (metres/100 inhabitants)	In the Ruhr area			In Southern and South- Germany	In North- Western Germany	In Central Germany	In Eastern Germany	On Average	Tail probability	(N) ¹
1890	96.2	75.3	82.5	70.2	52.2	75.9	0.133	(40)		
1900	120.1	101.7	100.7	88.6	58.3	96.3	0.011	(42)		
1910	122.2	129.9	115.1	99.8	84.1	113.1	0.010	(44)		

Sources: Calculated on the basis of Statistisches Jahrbuch Deutscher Städte, Jg. 2. p. 90; Jg. 11. p. 466; Jg. 19, pp. 570—573.

Geographical location of the city:

In the Ruhr area: Aachen, Barmen, Cologne, Crefeld, Dortmund, Düsseldorf, Elberfeld, Essen
In Southern and South-Western Germany: Augsburg, Frankfurt a.M., Karlsruhe, Mainz, Mannheim, Metz, Mulhouse,
Munich, Nuremberg, Strasbourg, Stuttgart, Wiesbaden Würzburg

In North-Western Germany: Altona, Brunswick, Bremen, Cassel, Hamburg, Hanover, Kiel, Lübeck

In Central Germany: Berlin, Chemnitz, Dresden, Erfurt, Halle, Leipzig, Magdeburg, Potsdam

In Eastern Germany: Breslau, Danzig, Frankfurt a.O., Görlitz, Königsberg. Posen, Stettin

1 Missing: 1890: Elberfeld, Mulhouse, Stettin, Würzburg

1900: Frankfurt a.O., Mulhouse

(118.4 l), Bristol (123.0 l), Cardiff (131.1 l) and Sheffield (116.3 l) are very near the German average. On the other hand the amount of water used in some Scottish and Irish towns was astonishingly great: in Glasgow 294.4 l, Dundee 235.4 l, Edinburgh 207.0 l and Aberdeen 180.2 l. The figure for Belfast was 178.7 l and for Dublin 170.2 l.³⁷

It is possible to conclude that water consumption in Germany indicates extremely well the standard of development of the municipal infrastructure. The high consumption figures of textile and metal cities can be explained by the need to satisfy industry. In addition the high water consumption figures relate to cities in the Ruhr area and in Southern and South-Western Germany. This reflects also the fact that cities formed reference groups for each other, especially when they were located in close proximity.

The differences in the water consumption of the various towns and cities of the British Isles may be explained by methods used by Scottish and Irish towns in constructing their water mains systems. In Scotland the transfer to the use of ground water had taken place at an early stage.

The Nordic contribution to the discussion on water supply and sewerage

When studying the development process of large European cities scholars hardly ever consider how important it was for the Nordic large cities to keep abreast of international developments. For the bourgeoisie in Stockholm as well as in Helsinki the reference group was, indeed, the large European cities and it is very interesting to analyze which particular city was used as a model for each particular service.

Another interesting aspect is to study the speed with which new innovations, like the water system for example, was adopted in various cities. In the Nordic countries it was

37. Comparative Municipal Statistics, Vol. I, 1912—1913, pp. 104—107.

customary already in the mid-19th century to send an expert to investigate on the spot the applications of new inventions and this was a common practice when developing urban technology.³⁸

During the period of this research Finland, an autonomous Grand Duchy, was part of the Russian Empire, but traditionally the contacts of educated Finns lay either in Sweden or in Germany. Finland had been part of Sweden since the 12th century until 1809 and Swedish was the mother tongue of the Finnish elite of the time. Since the Middle Ages Finns had been pursuing academic studies first in French and later in German universities. The dominance of the German and French languages in grammar schools and of German and English in commercial schools, trade contacts and regular traffic across the Baltic to Stettin, Stockholm, Gothenburg and from there even to England, all these contributed to the maintenance of lively contacts with the European continent. New disciplines, technology and economics, followed closely the German developments of the equivalent branches of knowledge and Finns also acquired models for their plans from that country. In addition many Finnish doctors and veterinary surgeons got their professional training in Germany.³⁹

Finnish local politicians considered the right of self-government enjoyed by German towns and cities an inspiring example, as is evident from a statement by Yrjö Harvia, the chairman of the Finnish Association of Cities,

"The municipal policy of the German cities has traditionally been followed by the Finnish municipal politicians with great interest. We have great respect for the excellent results which the German cities have achieved in organizing and running their administration. It is quite probable that we in

38. It is especially noteworthy that those who worked educational services made study tours to the continent in the middle of the 19th century. See e.g. Aimo Halila, *Suomen kansakoululaitoksen historia I—IV*, Turku 1949—1950; Taimo Iisalo, *Suomen reaalikoulut. Väliasteen koulut maassamme vuosina 1860—1884*. Helsingin yliopiston kasvatustieteen laitoksen tutkimuksia 25, Helsinki 1973.

39. Paasivirta, Juhani, *Suomi ja Eurooppa I*, Helsinki 1978, pp. 404—408.

Finland continue to follow the example of German Cities in municipal government.”⁴⁰

Before Finnish independence in 1917, towards the end of so-called Period of Russification, the Finnish cities and towns were assumed to have to take the leading role in the country's cultural and economic development, because very little could be achieved on the political front.

”When all progress is prevented by the government, the municipalities must, whenever it is possible, on the basis of their self-government, take the role of the State and support and promote material, intellectual and social development.”⁴¹

In addition to Germany other European countries and large cities were also the destinations of fact finding tours. In the course of time the number of these trips increased as did the number of cities visited. For example during the most intensive period of the city's growth, in the 1890's, Helsinki City Council sent scores of experts representing various fields to investigate solutions achieved elsewhere in Europe. Interestingly enough, the increasing follow-up of technological inventions and the development of infrastructural services encouraged the experts to direct their journeys also to small European towns, and small countries, so that the Netherlands, Belgium and Switzerland were included in their itineraries alongside the other Nordic countries, Germany, Great Britain, France and Austria-Hungary.⁴²

Further evidence that the Nordic cities considered large European cities a suitable reference group is provided by the fact that in Stockholm plans for a waterworks were already

40. Yrjö Harvia, Suomen kaupunkien tulevaisuuden tehtävät (Die Zukunftsaufgaben der finnischen Städte), undated, Yrjö Harvian kokoelma, Helsinki City Archives.

41. Mietintö siitä miten kaupunkien etuja voitaisiin yhteisvoimin parhaiten edistää. Suomen Kaupunkiliiton pöytäkirjat 1912, Archives of the Association of Finnish Cities.

42. Esim. Reseberättelse afgiven till Drätselkammaren i Helsingfors af C. Hausen. Helsingfors stadsfullmäktiges tryckta handlingar för 1889; K. Relander, Kertomus hygieniseltä opintomatkalta Eurooppaan 1894—95 (Lääkintöhallitus, Matkakertomukset 1894—1896, National Archives of Finland).

being prepared as early as 1853 and even in Helsinki, only eight years later such a project was under consideration although the population of the city was then merely 22,228. Indeed, Helsinki only entered the league of large cities (over 100,000 inhabitants) in the early years of the 20th century.⁴³ (Cf. Appendix VI.)

So at the same time that the engineer Wiebe from Berlin was visiting London and Paris a Swedish Captain F. V. Leijonancker was making a study tour in 1853 as representative of Stockholm's waterworks and road department to inspect waterworks in England and Scotland. After a tour covering fifty different cities he prepared a plan for the establishment of a waterworks in Stockholm. In his report, which clearly displays his thorough familiarity with the Chadwick Report, Leijonancker uses the need to improve the circumstances of the working class on humanitarian and political grounds as an argument for action in this area. According to him not only tidier dwellings and improved personal hygiene but also the provision of pure water were necessary preconditions for the physical and moral wellbeing of the population. When reporting on the low mortality in the better parts of London and the good physical state of Aberdonians he concluded that they were partly due to the use of ground water supplies. Leijonancker's plan was submitted to a committee established to develop it in more detail and, in addition, an English expert, Th. Hawksley, was invited to Stockholm to give his comments on the plan, after which the plan was finally accepted by the city authorities.⁴⁴

A clear indication of the inability of decision-makers to forecast rapid urban growth is the fact that the Swedish plan was originally made for a city with only 120,000 inhabitants whereas the total population in Stockholm already exceeded 110,000 in 1860.⁴⁵ This meant in practice the use of four million

43. Statistisk Årsbok för Finland 1909, ny serie, Helsingfors 1909, p. 10; Statistisk Årsbok för Finland 1939, Helsingfors 1939, tab. 10.

44. Stockholms Vattenledning, in: Tidskrift för Byggnadskonst och ingenjörvetenskapen, utgifven af G. Nerman och A. W. Edelswärd, 4. årg, Stockholm 1862.

45. The population of Stockholm in 1860 was 112,391 (2.9 per cent of the total population of Sweden); The population of Helsinki in 1860 was 22,228 (1.3 per cent of the total population in Finland), sources: Oscar Nikula, *Kaupunkilaitos 1721—1875*, in: *Suomen kaupunkilaitoksen historia* 1, Vantaa 1981, p. 286.

pottles or two million gallons a year. It was also decided to raise a loan for the construction of the water system and the actual building took two years, from 1859 to 1861. Even if the first clientele of the waterworks consisted only of forty houses in fact the city of Stockholm was in European terms on the move relatively early, especially given that hydrants were soon erected in various parts of the town to provide households with free tapwater. By 1865 four Swedish towns in all had already got their own waterworks. An interesting detail worth mentioning is that the city of Gothenburg collected water charges only from industrial customers leaving private consumers to enjoy free use of water. In Finland in some smaller towns the funds for constructing the water system were boosted from the profits made by local licensed companies⁴⁶. It was also generally accepted that on no condition should the provision of water be allowed to make private entrepreneurs rich as happened in London where eight private water companies operated.⁴⁷

By 1900 50 Swedish towns had already established waterworks and by 1909, the total number of waterworks had risen to 81, all of which were owned by municipalities. Of these 43 towns used ground or spring water, 31 surface water and 7 made use of a mixture of ground and surface water.⁴⁸

When a debate was launched in Helsinki, in the Imperial Senate of Finland, in 1861 on the need for public water mains, the aspect most emphasized was the necessity to improve fire precautions. The Senate appointed as planner a Norwegian engineer, Erik Lekve, and he was able to become familiar with innovations in Altona and in Hamburg without needing to make the long and tiring journey to Great Britain.⁴⁹ In due

46. A. Lagergr  n, *N  gra anteckningar om vatten-, gas- och electricitetsverkens samt elektriska sp  rv  gnarnas utveckling i v  ra samh  llen*. Minneskrift utgifven av Svenska Stadsf  rbundets Tidskrift till 50-  rsdagen av f  rordningen om kommunalstyrelse i stad den 21 mars 1862, Stockholm 1912, pp. 267—268; Bengt Svensson, *De f  rsta kommunala industrif  retagen*, in: *Hundra   r under kommunalf  rfattningarna 1862—1962*, Stockholm 1962, p. 145.

47. Adolf Damaschke, *Kunnallispolitiikan teht  vist  *, (Translation in Finnish by Eino Kuusi), Porvoo 1908. [Originale Auflage: *Aufgaben der Gemeindepolitik*. ("Vom Gemeindesozialismus.") Jena 1901]

48. Lagergr  n 1912, p. 271; Kallenaution 1983, p. 311.

49. E. Lekve, *F  rslag till vattenledning f  r Helsingfors stad p   grund av   fverhettligt uppdrag*, Helsingfors 1866.

course the construction of the Helsinki water system was completed in 1876 by a private construction company, Huber Ltd from Berlin, and a few years later, in 1880, the city transferred it to municipal ownership. The purchase of the water works proved to be a quite remunerative act, for after 6—7 years in municipal ownership the works started to produce a profit, and in 1900, for example, the fees from water consumption were enough to meet not only the normal operational costs of the works but also to provide free water for the general needs of the city, for its public buildings, cleansing of streets and for prevention of fires.⁵⁰ It is worth noting, that matters relating to the water and sewerage systems were discussed in Helsinki City Council and in its Finance Department (which was also an executive body) as issues of business economics, in other words, economic profitability actually decided the final outcome. — By 1900 four further towns, Turku, Tampere, Oulu and Viborg, had established their own waterworks.⁵¹

In the early years of the operation of the waterworks water consumption per inhabitant in Helsinki was still quite modest. In 1880 it was 24 litres, ten years later 64 litres and in 1910 81 litres per person.⁵² These figures correspond with the respective figures for the Central and Eastern towns and cities of Imperial Germany.

In explaining the relatively modest water consumption in Helsinki one has to bear in mind that Helsinki was not an industrial city but an administrative city dominated by civil servants and other officials. In addition the Finnish habit of spending summer seasons on the seacosts and lake shores as well as the Finnish sauna tradition excluding the taking of 'tub' baths were bound to reduce in any case the level of private water consumption.

The history of the *Helsinki waterworks* is an excellent example how intensively European developments were followed in Finland. Often new ideas were conveyed by persons

50. Berättelse angående Helsingfors stads kommunalförvaltning år 1900, pp. 139—140.

51. Kallenautio 1983, p. 312.

52. Åström, Sven-Erik, Kaupunkiyhteiskunta murrosvaiheessa. Helsingin kaupungin historia IV:2, Helsinki 1956, p. 200.

with engineering or chemical training but initiatives came also from other municipal administrators. For example the Helsinki Water Engineer, C. Hausen, was sent in 1889 on a foreign study tour largely because of an initiative taken by a Deputy Mayor, E. Öhman.⁵³ In general the investigations by the City Council and various municipal bodies into foreign circumstances were undertaken (most often on the initiative of private persons or business enterprises) either to introduce entirely new areas of infrastructure to Helsinki, such as gasworks, a water system, tramways, electricity etc., or to improve already established forms of urban technology, by, for example, constructing new premises for the fire services and improving their equipment. In the latter case the first steps were often taken by the city officials themselves.

Openness to new ideas was also shown during deliberations on the modernization of harbour construction. At that time the Harbour Construction Committee proposed that a delegation should be sent to the largest foreign cities to investigate in detail the management of port traffic in the actual locations so that troublesome and expensive mistakes could be avoided. In the first place the members wanted to learn about harbour cranes as well as about power supply and lighting systems and it was decided that a three man delegation, consisting of the Municipal Engineer, Municipal Architect and an electrician, should be sent to Copenhagen, Lübeck, Hamburg and Bremen and "possibly to some other ports".⁵⁴

Helsinki had purchased its waterworks in 1880. During the closing decades of the 19th century, however, a continuous problem was caused by the fact that because of the quite primitive physical filtration methods used no pure water of a quality likely to satisfy consumers had so far been produced from the humous and clayey waters of the river Vantaa. In spite of occasional periods when the water was relatively translucent, users kept on complaining about its yellowish colour and during the early summer it occasionally had also an

53. Reseberättelse afgiven till Drätselkammaren i Helsingfors af C. Hausen I—II. Helsingfors stadsfullmäktiges tryckta handlingar för 1889, Helsingfors 1890.

54. Berättelse angående Helsingfors stads kommunalförvaltning år 1893, pp. 108—109.

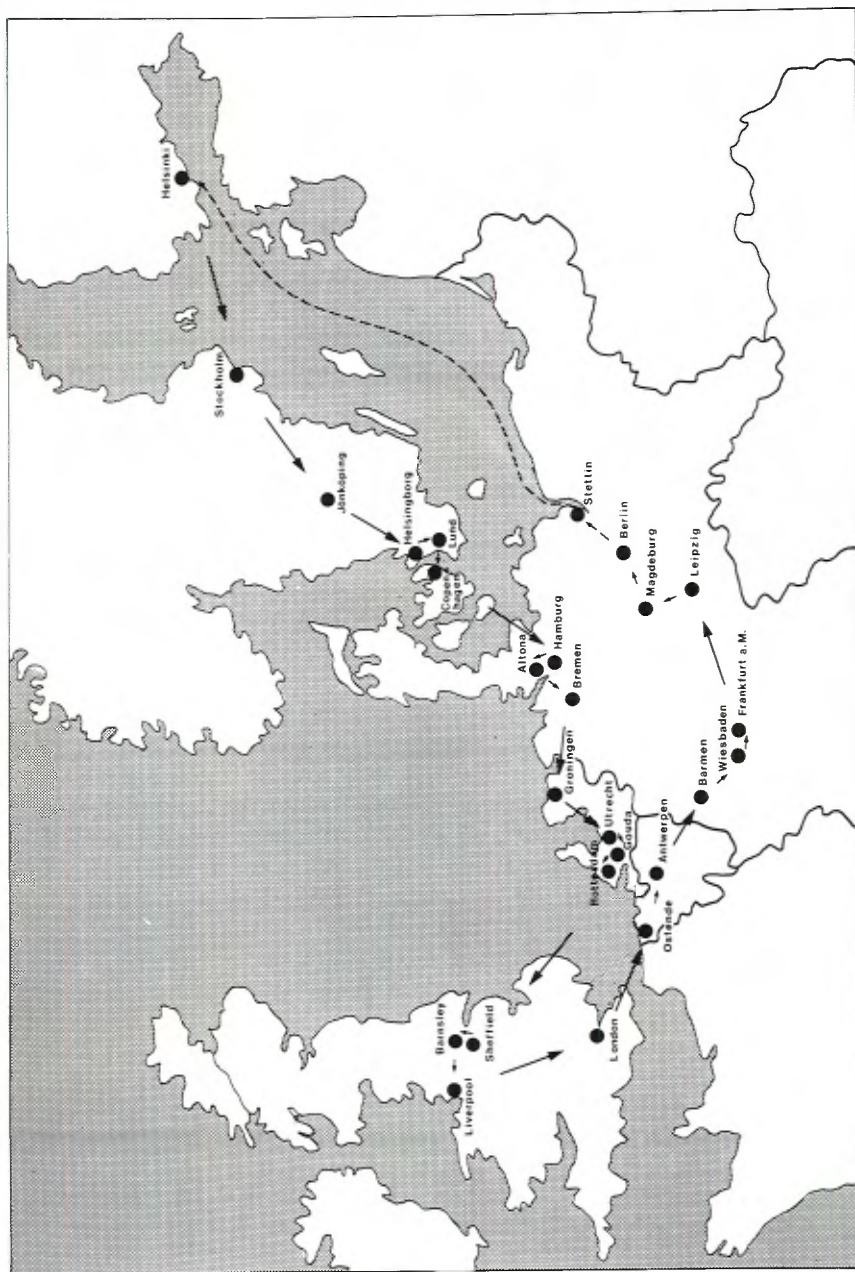
unpleasant smell. In addition, the rapid population growth in Helsinki at that time required the otherwise quite parsimonious city councillors to consider the possible expansion of the waterworks and of the watermains network.⁵⁵

The supply of pure water was considered especially important in Finland after various epidemics, such as cholera in 1892.⁵⁶ In addition the Public Health Care Order, enacted in 1879, and following in the main the principles of the British 1874 Health Act and the equivalent Swedish Health Care Order, obliged the cities to control the quality of water. After all pure water was essential in fighting against epidemics. Consequently the tap water as well as the river water from the Vantaa began to be inspected on a regular basis in Helsinki.

Meanwhile great progress had been made both in Europe and in America so far as water filtration techniques were concerned. In 1889 the Helsinki Municipal Water Engineer was sent to investigate the developments and achievements of water system technology as well as to collect evidence on the most modern methods of filtration. The authorities expressed the hope that new information gathered on this tour would be utilized in the extensive water main construction work which they had decided to embark upon in that same year. All in all Municipal Engineer C. Hausen visited waterworks in 22 European towns and cities as well as the Water Departments in Frankfurt am Main and Wiesbaden where he investigated also the financial aspects of water treatment. In addition he collected information from various other institutions and had discussions with a number of experts. In his detailed report Hausen analysed first the various filtration methods and their suitability for the Helsinki water system. Most of the waterworks he visited used sedimentation basins with a meter thick sand layer base for water purification. Chemical methods were only employed in three Dutch towns and according to Hausen there was no adequate evidence available about the superiority of this method; besides it was also more expensive to use. In addition, in the Groningen waterworks for example, it proved possible to get rid of the yellowish colour in the

55. Helsingfors stadsfullmäktiges tryckta handlingar för 1890, n:o 13; 1893, n:o 25; 1902, n:o 22.

56. Åström 1956, pp. 198—199.



Map 1. The study tour of the Helsinki Water Engineer C. Hausen to various European cities during the period January 19th to April 16th 1889. Hausen collected information on the newest achievements in water system technology for extensive water main construction work. He was especially interested in the most modern methods of filtration. (His return route from Berlin is unknown.)

water by mixing a sulphate soil with it, though as 'side-effects' the content of solid particles in water increased by 63 per cent, its calciferousness by 22 per cent and its sulphuric acidity by 702 per cent. These figures must have had a negative influence on the city councillors, whose knowledge of chemistry was relatively slight, as, indeed, Hausen may well have intended. In any case he recommended the improving of mechanical filtration method based on the use of sand, simultaneously with the lengthening of the standing time of water in the sedimentation basins.⁵⁷

Not only does Hausen's Report contain information on matters related to water purification but it also includes a wealth of detail on the pumping systems used in different waterworks, the lengths of water main systems, the diameters and materials of pipes, the water pressures used in the mains, the structure and maintenance of hydrants, water meters, water consumption, water prices as well as the organization of waterworks' administration in various towns and cities. Finally Hausen proposes a number of new measures for improving the Helsinki waterworks. "If the above mentioned proposals are carried out our waterworks need not fear comparison with any foreign waterworks in any respect."⁵⁸

It was also partly due to Hausen's tour that the capacity of Helsinki waterworks was increased (the pumping capacity of the pumps was raised by 250 per cent of the maximal water consumption in 1889) as was the efficiency of the filtration methods while the network of water mains was also expanded. To finance these projects the city employed a total of 1.6 million marks, part of the proceeds of a bond issue in 1892.⁵⁹

In spite of the improved mechanical filtration methods the quality of tap water remained unsatisfactory in Helsinki. The matter caused lively debate in the press and various bodies,

57. Reseberättelse afgiven till Drätselkammaren i Helsingfors af C. Hausen I—II. Helsingfors stadsfullmäktiges tryckta handlingar för 1889, Helsingfors 1890.

58. *Ibid.*, p. 59.

59. Data concerning the use of bond 1892 in Helsinki. E.g. Helsingin kaupunginvaltuuston painetut asiakirjat 1908, n:o 10, Asiakirjoja, jotka koskevat Helsingin kaupungin tilejä ja tilinpäätöstä vuodelta 1907, pp. 78—79.

including the Tekniska Föreningen (The Association of Engineers), proposed the investigation of new methods.⁶⁰

Thus after ten years, in 1899, the Financial Department of Helsinki no longer insisted on the use of a mechanical filtration system only. An added encouragement was received from the fact that the director of the Municipal Institute for Research into Foodstuffs, Allan Zilliacus, had achieved promising results in his laboratory attempts at purifying the Vantaa water using ferric chloride (FeCl_3).⁶¹ The following spring the Department sent him to investigate the chemical purifying methods used in Dutch water works and so Allan Zilliacus visited towns, such as Groningen, Delft, Shiedam, Gouda and Vlaardingen, which all used surface water like Helsinki.⁶²

As a result of his journey Zilliacus became convinced of the superiority of chemical filtration methods and proposed, on his return, that the use of chemicals for purifying Vantaa water would be the only feasible way to provide an adequate amount of high quality tap water in Helsinki.⁶³

Consequently Zilliacus embarked on purification experiments using ferric chloride and ferrous sulfate (FeSO_4) and became an opponent of the Municipal Water Engineer, Hausen, who still believed in the old mechanical purifying method. Basing his arguments on the statement of the Municipal Board of Public Health Zilliacus disproved Hausen's assumptions on the possible health risks caused by chemically purified water. Hausen for his part belittled the test results obtained by Zilliacus and there was also a general tendency to consider the Dutch models as unrepresentative.⁶⁴

Because of the negative stand taken by Hausen, then the Director of the Waterworks Office, the City Finance Department did not make any decisions in favour of either method pointing to the disagreements between expert opinions.

60. Helsingfors stadsfullmäktiges tryckta handlingar för 1902, n:o 22, Handlingar rörande frågan om vattenledningsvattnets rening, p. 1.

61. Ibid., pp. 1—3.

62. Ibid., pp. 4—11.

63. Ibid., pp. 10—11.

64. Helsingfors stadsfullmäktiges tryckta handlingar för 1902, n:o 34, Förslag till aflagringsbassiner för Wandavattnets rening; 1902, n:o 36, Handlingar hörande till frågan om aflagringsbassiner för Vandaåvattnets rening.

After this episode attention was again transferred, to the trends to be observed in other European cities and to a more active search for sources of ground water. Supplies of this kind of water discovered in the Helsinki area were found, however, to be inadequate for the needs of the municipal water supply.⁶⁵

The population of Helsinki grew explosively in the 1890's and the early years of the 20th century (by 50 per cent between 1890 and 1900)⁶⁶ and concern about the capacity of the municipal waterworks increased from one year to another because the upper limit of the supply of filtrated water was almost approached. Finding solutions became easier after a change of director at the Waterworks Office and in spring 1907 the new Director, Albin Skog, a civil engineer, and Zilliacus were sent abroad to investigate the applications of quickfilter in Europe.⁶⁷

In his report on the tour Skog indicated the following trends prevailing in cities and towns he had visited

"I would like to sum up my observations during my journey as follows:

Good waterworks which use surface water as their raw water are being abandoned and a transfer is taking place to the use of ground water (Berlin).

In places where there are no adequate reserves of ground water available they are not satisfied with filtering surface water just once but they are using, if necessary, sedimentation basins and double filtration (Bremen, Zürich and Magdeburg).

At the times of the year when sedimentation and filtration do not yield perfect water chemical substances and sulphuric clay are being, applied (Bremen, Gouda and Groningen).

In localities where construction of great sand filter

65. Kertomus Helsingin kaupungin kunnallishallinnosta 1905, II, p. 46; Helsingin kaupunginvaltuuston painetut asiakirjat 1908, n:o 9, Lausunto ehdotuksista, joka tarkoittaa Vantaan veden puhdistamasta kemiatuotteilla ja suodattamista amerikkalaisilla pikasuodattimilla, pp. 2, 5—6.

66. The population of Helsinki increased by 52,1 per cent between 1890 and 1900. Statistisk Årsbok för Finland 1939, tab 10.

67. Helsingin kaupunginvaltuuston painetut asiakirjat 1908, n:o 9, p. 1.

systems and large sedimentation basins are not feasible or where they would involve extensively high costs or where the aim is to apply the simplest methods possible the American quickfilters and chemical water purification are employed (Trieste, Gera and Ysselmonde)."⁶⁸

The tour had convinced Skog of the usefulness of the quick-filter used together with chemical filtration and he also convinced the city councillors with the aid of his experiments on the Vantaa water.

With a quick-filter (Jewell) it was possible to purify a greater amount of water per time unit than when using the sand filtration method. Therefore the purified water did not become essentially more expensive than when using the older method. The use of quick-filter clearly required also a smaller number of filtration basins than the former method. The actual investment costs were estimated to be 940,000 marks for the old method and 610,000 marks for the method employing chemical and quick-filtrations.⁶⁹

During the discussions about municipal water supplies, stretching over many years, *the Helsinki City Council did not rely only on the observations and reports of its own officials. They also invited comments from foreign experts, such as Professor Richert, who is considered the creator of the modern Swedish water system, as well as A. O. Alrutz, the Director of Stockholm Waterworks. Likewise in 1907, at the suggestion of the Waterworks an expert was invited, from the Jewell Export Filter Company based in New York, to give more detailed information about quick-filters.*⁷⁰ In addition the leadership of the Waterworks *had direct personal contacts with directors of European waterworks*; so for example Hausen expresses his gratitude, at the end of his report, to the Director of the Stockholm Waterworks, A. O. Alrutz as well as to Mr. Ollgaard in the Copenhagen Waterworks and Mr. Eaton, head of the Sheffield Waterworks, whose letter of recommendation opened the doors of Mr. Parry in Liverpool and Mr. Hawksley in

68. Ibid., p. 28.

69. Ibid., pp. 2—4, 9—18.

70. Ibid., p. 1; Kertomus Helsingin kaupungin kunnallishallinnosta 1905, II, p. 46; 1907, II, p. 62.

London. Hausen's host in Berlin was engineer Piefke.⁷¹

Information about foreign waterworks was also obtained by following specialist literature. Hausen's report contains for example a list of the most relevant literature in this field published in Germany, Britain and Denmark.⁷²

After the construction of the water mains systems *other matters relating to public sanitation and hygiene* became of topical interest both in Stockholm and in Helsinki. At the turn of the century Karl Tingsten made a study tour travelling not only to the European cities but also to the United States.⁷³ As a

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71. Reseberättelse afgiven till Drätselkammaren i Helsingfors af C. Hausen, II. Helsingfors stadsfullmäktiges tryckta handlingar för 1889, Helsingfors 1890, pp. 59—60.
72. Ibid., p. 61; Hausen used quite a lot of publications when preparing his proposals, for example the following list in Hausen's report:
- Devonshire, E. Three years experience of water purification by means of iron in Anderson's revolving iron purifier. 3 Whitehall Place. London 1888. La purification des eaux. Gand 1889.
 - Dupont, F. J., Over microscopisch Drinkwateronderzoek gedurende het jaar 1887. Rotterdam.
 - Festschrift zur XXIII Jahresversammlung des deutschen Vereins von Gas- und Wasserfachmännern. Berlin 1883.
 - Gill, H. and Foelsch, A., Hamburger Stadtwasserkunst. Hamburg 1881.
 - Grahn, E., Statistik der deutschen Wasserversorgungen. Munich 1878.
 - Grahn, E., Die Art der Wasserversorgung der Städte des deutschen Reiches. Munich 1883.
 - Grahn E. and Meyer, F. A., Reisebericht einer von Hamburg nach Paris und London ausgesandten Commission über künstliche centrale Sandfiltration. Hamburg 1877.
 - Kjøbenhavns Kommunalbestyrelse. Fremstilling af forskellige Kjøbenhavnske Kommunale Forhold. Kjøbenhavn 1888.
 - Parry, J., Water. London, Frederick Warne & Co.
 - Piefke, C., Mittheilungen über natürliche und künstliche Sandfiltration. Berlin 1881.
 - Reichardt, E., Grundlagen zur Beurtheilung des Trinkwassers. Halle a. S. 1880.
- S. — Samuelsson, S. A., Sandfiltration und konstante Wasserversorgung. Hamburg 1882.
- Stadtbauamt München. Auszug aus den Regulativen und den Preistarifen für die Wasserversorgung von 51 Städten Deutschlands, Oesterreichs und der Schweiz. Munich 1883.
 - Tiemann, F. and Gärtner, A., Die chemische und mikroskopisch-bakteriologische Untersuchung des Wassers. Brunswick 1889.
 - Wibel, F., Die Fluss- und Bodenwässer Hamburgs. Hamburg 1876.
73. Karl Tingsten, Stockholms renhållningsväsen från äldsta tider till våra dagar, Stockholm 1911.

result it was eventually agreed to establish a sewerage system and refuse collection in Stockholm. Funds for constructing a sewerage system in Helsinki were included in the budget of the city in 1878.⁷⁴

The main reason for attempts to *purify sewage* was the eutrophication of Helsinki waters, which has started to become evident especially in shallow inlets, such as Töölönlahti, inside the actual city. Sewage, which contained mainly various kinds of household sewage, such as dishwater, washing and bathing waters as well as water closet waters, polluted shallow bays and this was considered to form a health risk for the inhabitants of the city.⁷⁵

The same comparative method and the following of the latest foreign solutions and their further development as in the case of water purification were evident also in the investigations concerning the purification of sewage. Because the circumstances in Helsinki differed, however, from those abroad mainly because of more inclement climate (e.g. winter frost) and because of 'other circumstances' the Finns were concerned to find the most efficient methods in relation to the funds available. It was therefore decided to perform at home experiments using various foreign methods of sewage purification.⁷⁶

The experiments with regard to purifying sewage running into the Töölönlahti were executed by a Finnish Professor A. Palmberg, an internationally renowned hygienist. According to him there were three methods to choose from: chemical, mechanical and biological. Following foreign examples Palmberg chose the biological method for the operational principle of his experiment station both for cost reasons and for achieving the best purification result.⁷⁷ The idea behind the biological method was to let the water stay first in sorting basins (where heavy particles fell to the bottom) and oxidize it in the special oxidation plants.⁷⁸

74. Kallenautio 1983, pp. 271—282.

75. Helsingin kaupunginvaltuuston painetut asiakirjat 1905, n:o 11, p. 8; 1909, n:o 47, pp. 2—6.

76. Helsingin kaupunginvaltuuston painetut asiakirjat 1905, n:o 20, p. 3; 1909, n:o 47, p. 25.

77. Helsingin kaupunginvaltuuston painetut asiakirjat 1905, n:o 11, p. 5.

78. Ibid., pp. 5—6.



Figure 12.

Illustrations from Albert Palmberg's text-book A Treatise on Public Health and its applications in different European countries. (Orig. Allmän hälsovårdslära på grund af dess tillämpning i olika länder, Borgå 1889). Palmberg was a Finnish professor of hygiene and his book was first translated into Spanish and later into French and English. It is known to have been used in the academic teaching of medicine at least in England and Spain.

This kind of combined sorting and oxidation plant had, according to the survey by Palmberg, been in operation for years in Great Britain, for example in Exeter, Sutton, Sheffield, Liverpool, Yeovil, Leeds and Hampton. Already in October 1900 the highest official responsible for health in England had issued general guidelines for the establishment of such purifying plants. In America the situation was the same. In Germany such plants were operating, at least in Stargard, Waldhof-Elgerschausen and in Grünewald. According to Palmberg all the various biological methods (like the effect of mere oxidization) had in general been the subjects of experiments in the Königliche Prüfungsanstalt für Wasserversorgung in Berlin.⁷⁹ Their publication *Mitteilungen aus der Königlichen Prüfungsanstalt für Wasserversorgung und Abwasserbeseitigung* as well as for example the *Gesundheits-Ingenieur* and technical literature discussing sewage matters were quite widely used also among the health authorities of Helsinki.⁸⁰

Professor Palmberg did not, however, content himself with simply imitating the methods of foreign experts and authorities (such as Professor Dunbar in Hamburg), but *developed his own purifying method* which essentially departed from them. True, the first stage in the Palmberg's plant also contained sorting basins (applying the septic tank idea), but he totally abandoned the phase of oxidization. Instead he filtered waters from the sorting basins with peat filters.⁸¹

The officials responsible for the purification of the city's sewage, the Municipal Engineer and the health authorities, were in 1905, however, not very convinced of the "excellence" of Palmberg's inventions, but rather preferred the application of foreign models.⁸² The final outcome was that two smallish septic tank plants (with the combined capacity to deal with a population of 6,000 people) were established in the city for the purification of sewage and their general plans were prepared

79. Ibid., pp. 11—12.

80. See e.g. Helsingin kaupunginvaltuuston painetut asiakirjat 1905, n:o 20, p. 3 and G. K. Bergman, Tutkimuksia Helsingin laskuveden vaikutuksesta vesiin kaupungin ympäristössä kesällä 1908, in: Helsingin Terveystieteidenlaitoksen vuosikertomus vuodelta 1907, Helsinki 1908.

81. Helsingin kaupunginvaltuuston painetut asiakirjat 1905, n:o 11, p. 8.

82. Ibid., pp. 2—4.

by the Septic Tank Company in Copenhagen.⁸³ The principal method proposed to prevent the damage caused by sewage disposal in the shorewaters of Helsinki was simply the piping of the untreated sewage further from the city's shoreline to some deeper bays in the sea.⁸⁴

The example of the city of Helsinki indicates how many channels of innovation diffusion were actually used. In the take-off stage of the growth of the city caution was employed in taking risks, efforts were made to avoid bad investments. Well-known foreign experts were consulted and personal contacts exploited. As the growth of cities accelerated so also the channels for searching information became more varied.

In an endeavour to get familiar with new water main and sewerage systems in several different places not only were extensive tours round Europe carried out and experiences gained during these journeys compared with each other but also the literature and increasingly specialized trade press were followed keenly. Finnish journals also published special 'From Abroad' columns where the most eager could get information on the latest innovations from various fields. It is interesting to notice that already at the turn of the century the Finnish Professor Palmberg and his team had developed a method for purifying sewage water which creditably competed with suggested foreign methods. Thus Helsinki had reached already in the early years of the 20th century the stage during which the city was even able to become the party supplying innovative ideas to others.

Gas and electricity

"It is due to the British entrepreneurial spirit and capital that German cities got the supplies of fresh drinking water and gas for lighting"

83. Helsingin kaupunginvaltuuston painetut asiakirjat 1909, n:o 47, p. 14; Kertomus Helsingin kaupungin kunnallishallinnosta 1909, pp. 60—62.

84. Helsingin kaupunginvaltuuston painetut asiakirjat 1909, n:o 47, pp. 2—3, 10.

claimed a German engineer, Hans Dominik, in an article published by the *Städte-Zeitung*.⁸⁵ Indeed, the aims of the Imperial Continental Gas Association, founded in London in 1824, was to establish gasworks in European cities. It was due to this association that a gasworks was established in Hanover in 1825, followed by others in Berlin in 1826 and Frankfurt am Main and Dresden in 1828.⁸⁶

In Great Britain Manchester was the first city to have a municipal gasworks, established in 1817.⁸⁷ The introduction of gas was much encouraged by the pursuit of safety and no search for profits was involved. Street lighting by gas was first introduced in London and after the discovery of the industrial use of gas, gasworks soon began to be established in the largest British cities. In the beginning the mutual competition of the companies was very keen. Some towns were served by more than one gas company, but through amalgamations, price-fixing, and agreement on territorial spheres competition practically ceased in the provinces by 1850 and in London by 1860. Nine municipalities assumed control of their gas supply before 1850; another 18 did so in the 1850's, 22 in the 1860's 76 in the 1870's 24 in the 1880's 50 in the 1890's and 25 between 1901 and 1910. Over two thirds were Northern and Midlands towns, but several large cities, Liverpool, Sheffield, Newcastle and Bristol as well as London, remained in the grip of private companies.⁸⁸

As Wolfgang R. Krabbe's thorough investigations show, the idea of establishing gasworks in the German cities originated with the initiatives of the municipal officials and in particular with those who were responsible for public safety. The provision of adequate street lighting was one form of action to that end. Thus Berlin for example was indebted to the Minister of Interior and Munich and Königsberg to the leadership of

85. Hans Dominik, Hundert Jahre kommunaler Technik, *Städte-Zeitung* 19.11.1908, p. 109.

86. Gerhard Stuber, Die Energie-und Wasserversorgung als Voraussetzung für die moderne Stadtentwicklung, in: Jürgen Südwow (ed.), *Städtische Versorgung und Entsorgung im Wandel der Geschichte. Stadt in der Geschichte, Veröffentlichungen des Südwestdeutschen Arbeitskreises für Stadtge-schichtsforschung*, Bd. 8, Sigmaringen 1981, p. 14.

87. Carl Johannes Fuchs 1922, p. 243; Krabbe 1985, p. 40.

88. Waller 1983, pp. 303—305; H. E. Finer, *Municipal Trading*, London 1941.

their Police Departments for their gasworks. With the exceptions of Dresden and Leipzig all of the early gasworks were owned by private companies. In general the contract period was some 20 to 25 years, during which the city allowed the companies to use the streets of the city for laying the gas mains and was rewarded with gas at cut price. All cities included in this study had got their gas mains system constructed by the 1850's and before that time the transferring of the gasworks to municipal ownership was never even discussed, because the decision-makers shunned such risk taking and the city officials were still too inexperienced to carry out such municipal business ventures. On the contrary, it was not infrequently that the experts from private gas companies are mentioned as having acted as economic advisors to the municipalities. Nevertheless the gasworks were later transferred to municipal ownership relatively quickly.⁸⁹

The industrial use of gas as a source of power became increasingly important during the 19th century. The introduction of the gas engine helped the operations of the smaller enterprises in particular during the second half of the century. So far as private households were concerned two inventions facilitated the use of gas: the gas mantle and the slot meter and consequently the use of gas in cookers and heaters increased rapidly.⁹⁰ The invention of the incandescent gas lamp at the end of the 19th century finally consolidated the use of gas in street lighting.⁹¹

Among city councillors the production of gas was increasingly considered as a monopolistic activity. The establishment of municipal gasworks or the transfer of private gas companies to municipal ownership was, nevertheless, a less simple operation than the municipalization of waterworks, which could always be argued for on health and sanitary grounds. Joseph Chambèrlain made the point when defending the purchase of some gasworks before the Birmingham City Council.

"When the purchase of the Water Works comes before you it will be a question concerning the health

89. Krabbe 1985, pp. 41—45.

90. Waller 1983, p. 304.

91. Stuber 1981, p. 15.

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FOR INCANDESCENT



No. 5118.—Enamelled Steel and Gold.

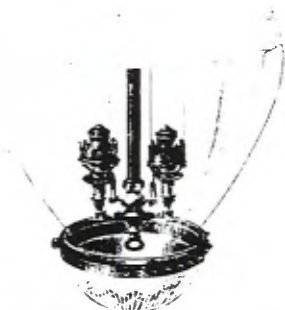


No. 2820.
With RIMING Globe.
Enamelled Steel Case.

**RAIN & Wind proof
BURNERS easily
accessible.
PATENT BY-PASS
ARRANGEMENT.**

LAMPS

GAS LIGHT.



No. 5174.—Copper throughout, Japaned Chrome and Gold.

Figure 13.

Gas was used for lighting streets long after the spread of electrification. Advertisement in *The Municipal Journal*.

of the town; the acquisition of the Gas Works concerns the profits of the town".⁹²

The municipalization of gasworks was much furthered by the claims not only of the price charged but also of the bad quality of gas provided by the companies. Thus for example in Scotland, where the municipalization of gasworks made rapid progress one argument used, as in Glasgow in 1869, was the general dissatisfaction with the operations of the local gas company. However, in spite of the policy of rapid municipalization adopted in some British cities, such as Birmingham, municipal gasworks formed only 35.9 per cent of

92. Quotation of the statement of Joseph Chamberlain in: Waller 1983, p. 304.

all gasworks in 1907 whereas the respective figure of German cities was 64.5 per cent.⁹³ The slow progress of municipalization was partly due to an admiration for private enterprise but also to the fear of the disadvantages of public ownership prevailing in Britain in the 19th century.

The following Table 24. presents the price of gas and electricity per unit as charged by private and municipal companies in 1912. It shows that the price of gas was higher in those cities which did not have municipal gasworks.

Table 24.

Gas and electricity per unit sold in some cities of the United Kingdom in 1912.

price of gas (d) per 1000 cubic meter sold		price of electricity (d) per unit sold (kwh)	
private company	municipal company	private company	municipal company
Sheffield	14.89	Birmingham	19.40
Newcastle	23.30	Belfast	21.79
Bristol	24.09	Glasgow	22.71
Liverpool	26.78	Dundee	25.51
London ¹	29.13	Leeds	25.56
Cardiff	31.67	Aberdeen	26.26
Swansea	33.61	Manchester	26.32
Dublin	39.18	Edinburgh	31.31
		Newcastle	0.91
		London ¹	2.47
		Manchester	1.08
		Birmingham	1.14
		Belfast	1.15
		Sheffield	1.25
		Dundee	1.25
		Glasgow	1.28
		Leeds	1.29
		Aberdeen	1.38
		Liverpool	1.66
		Bristol	1.74
		Edinburgh	1.80
		London	1.85
		Cardiff	2.47
		Swansea	2.80
		Dublin	2.85
mean	27.83	mean	24.86

Source: Comparative Municipal Statistics, Vol I, 1912—13, p. xxvi

¹ Several companies

In Germany, where the *laissez faire* economic policy was less dominant than in Britain, the municipalization of gasworks was much more rapid a process altogether. When the contract between the city and the gas company ended the municipality itself often bought the works and an added impetus to this policy was provided by the complaints about high rates or bad

93. Carl Johannes Fuchs 1922, p. 243.

quality of gas as well as about the fact that capacity was insufficient to satisfy the demands of the ever expanding outskirts of the cities.⁹⁴ Gasworks were acknowledged to be remunerative municipal enterprises and the specialist press gave space to articles discussing the profits that gas yielded. In 1908 Georg Jaffe wrote in the *Zeitschrift für Sozialwissenschaft* that the combined net receipts of 58 German cities was 45 million German marks, of which only 10 million was to be allocated to interest payments on basic and trading capital. Similarly the surplus from the electricity works was 17 million marks of which 5.5 million were to be earmarked for the interest paid on capital.⁹⁵

In 1860 of the total 255 gasworks in the German empire 176 were municipally owned. In 1877 the municipal share of gasworks was 45 per cent of a total 481 works. In 1896 the figure was 56 per cent of 724 and in 1913 78 per cent of 1385 gasworks.⁹⁶

In general municipalization reduced the price of gas. So, for example, when the city of Düsseldorf acquired the local gaswork in 1867 the tariffs were reduced from 55 pfennigs per cubic meter first to 19.38 pfennigs and soon to 17 pfennigs. From 1884 onwards a cheaper tariff was applied to industrial gas as well as to household gas for cooking and heating than to gas for lighting. Three years later, in 1887, an important step was taken in the scaling of the gas tariff which meant that the price of gas for power and heating was only half the price of gas for lighting. This naturally was most helpful in attracting industry to Düsseldorf and because the same tariffs were maintained from 1887 to 1905 and because after that year industry was provided with gas at an even cheaper rate, the circumstances in the city became even more attractive to incoming industry.⁹⁷ The same development took place also in Freiburg. Whereas the private gas company had sold all its gas at the same rate, scaling of the tariff was introduced when the city acquired the works. In 1885 the consumer had to pay 20

94. Stuber 1981, p. 16.

95. Georg Jaffe, Die wirtschaftlichen Unternehmungen der Städte, *Zeitschrift für Sozialwissenschaft*, Jg. 11, 1908.

96. Reulecke 1985, p. 57; Stuber 1981, p. 16.

97. Otto Most, *Gemeindebetriebe der Stadt Düsseldorf*. Schriften des Vereins für Socialpolitik, Bd. 129.2, Leipzig 1909, pp. 6—7, Tabelle 2.

pfennigs both for lighting gas and for heating gas, but later the tariff for heating gas was reduced to 14 pfennigs.⁹⁸

The municipalization of gasworks made rapid progress in Germany and consequently there were, before the First World War, only five cities with more than 100,000 inhabitants where private gas companies still operated, namely Berlin, Hanover, Frankfurt am Main, Dortmund and Strasbourg.⁹⁹

The amount of gas consumed per inhabitant is a most helpful ratio in comparing different cities, irrespective of the ownership of the gas companies. But in order to understand the real significance of gas it is necessary to explore first the development of electricity works which started to take over in the cities included in this study, after 1885. As Table 19. demonstrates, most of the electricity works were established in the 1890's.

Electricity was first introduced into hotels, theatres, restaurants, offices, railway stations and public buildings as a fire precaution. In the first stage the electricity was provided by works serving only individual buildings, then by works adequate to serve whole blocks and in the end by works big enough to cater for entire municipalities, at which point the municipal authorities became interested in this new form of energy. As was the case with gasworks the arguments for municipal electricity works rested on the expected profits. When electricity was used more extensively for industrial and heating purposes the municipal ownership of the works became an even more attractive proposition.¹⁰⁰

As Table 19. demonstrates of the cities included in this study it was Metz which acquired its electricity works first in 1885 and it was then followed by Berlin, Lübeck and Hamburg as well as by three old industrial cities dominated by textile industry, Mulhouse, Elberfeld and Barmen, the economies of which are estimated by Reulecke to have been quite healthy.¹⁰¹

98. Dr Jos. Ehrler, Die Entwicklung des städtischen Gaswerks in Freiburg i Br. von 1885—1910, Städte-Zeitung 2.9.1910, p. 656.

99. J. Engländer, Die privaten Gaswerksunternehmen, in: Handbuch der Gastechnik, Bd. X, Organisation und Verwaltung von Gaswerken, Munich and Berlin 1914, p. 1.

100. Waller 1983, pp. 305—307; Reulecke 1985, p. 126; Stuber 1981, p. 20; Mombert 1908, p. 20.

101. Reulecke 1985, p. 126.

Table 25.

Gas consumption per inhabitant (m³/yr) in 44 German cities in 1912.

1	Berlin	138.1
2	Bremen	133.5
3	Stuttgart	122.0
4	Hamburg	120.1
5	Karlsruhe	119.9
6	Elberfeld	112.7
7	Wiesbaden	109.1
8	Dresden	108.2
9	Nuremberg	100.8
10	Kiel	99.8
11	Cologne	98.8
12	Barmen	98.7
13	Lübeck	98.5
14	Breslau	98.3
15	Crefeld	97.5
16	Düsseldorf	96.1
17	Königsberg	90.4
18	Leipzig	89.4
19	Mannheim	88.8
20	Mulhouse	87.2
21	Altona	85.8
22	Essen	83.4
23	Mainz	81.9
24	Strasbourg	80.7
25	Aachen	75.7
26	Würzburg	74.0
27	Magdeburg	72.7
28	Chemnitz	71.7
29	Danzig	70.4
30	Munich	68.8
31	Görlitz	68.1
32	Cassel	66.0
33	Posen	64.7
34	Brunswick	62.8
35	Halle	61.9
36	Erfurt	57.2
37	Stettin	54.0
38	Metz	53.4
39	Augsburg	49.2
40	Dortmund	48.3

Missing: Frankfurt a. M., Frankfurt a.O., Hanover, Potsdam

Source: Statistisches Jahrbuch Deutscher Städte, Jg. 21, pp. 484—485.

Königsberg got its electricity works in 1890 followed by Hanover, Breslau, Cassel, Düsseldorf and Cologne. These were all cities where the willingness to take risks was great when measured for example by the amount of debt the city incurred for its municipal enterprises.

The most decisive factor in the further development of the use of electrical power was the electric tramway, which was first introduced at the industrial exhibition in Berlin in 1879. The electrification of tramways can be considered as the major reason for the increased demand for electricity.¹⁰² According to Waller "it is a mistake, however, to see electricity as a competitor for gas in industrial and domestic consumption."¹⁰³ For example in Manchester the electricity works, which had been established in 1893, was operating first under the authority of the Gas Committee and only four years later, in 1897 was it felt necessary to establish a separate Electricity Committee.¹⁰⁴

When relating, on the basis of Table 19., the construction of electric tramways to the years of establishment of the electricity works one can conclude that the developers of this new kind of public transport were already active before the establishment of a (municipal) electricity works in the cities. The single pioneer of electrified tramways in Germany was Frankfurt am Main in 1884, and it took eight years before they were established in Halle (1891), Bremen (1892), Hanover, Breslau, Chemnitz, Dresden and Essen (1893 in each city), followed by Barmen, Berlin, Erfurt, Hamburg, Lübeck and Mulhouse. In general the most active cities seem to have been the old administrative and commercial centres. One also notices that the tramways seemed to be a part of the image of the large cities and that the pressure for constructing them as such was great. Table 19. well illustrates this phenomenon, for by the year 1900 38 cities out of a total 39 had constructed an electric tramway system. — As an interesting example of how this group of large cities acted as a reference group it is worth

102. Stat. Jb. Deutscher Städte, Jg. 11, pp. 196—197, 212.

103. Waller 1983, pp. 306—307.

104. Douglas Knoop, The Trading Enterprises of Manchester, in: Gemeindebetriebe in Frankreich und England. Schriften des Vereins für Socialpolitik, Bd. 130.4, Leipzig 1910, p. 31.

Table 26.

Gas consumption per inhabitant (m^3/yr) in German cities according to the applied classification in 1890, 1900, 1910 and 1912.

	Commer- cial Cities	Adminis- trative Cities	Metal Industry Cities	Textile Industry Cities	Garrison Cities	Regional Centres	On Average	Tail prob- ability	(N) ¹
Consumption	1890 64.5	56.2	54.2	54.3	44.8	41.4	52.7	0.089	(38)
of Gas per	1900 70.3	63.8	60.3	62.6	68.0	49.7	61.9	0.297	(38)
inhabitant,	1910 95.5	89.5	71.4	89.2	79.7	70.7	84.0	0.170	(39)
(m^3/yr)	1912 104.4	93.5	81.5	86.8	78.4	69.9	86.5	0.084	(40)

Sources: Statistisches Jahrbuch Deutscher Städte, Jg. 3, p. 262; Jg. 11, p. 189; Jg. 19, pp. 786—787; Jg. 21, pp. 484—485.

Applied classification:

Commercial Cities: Altona, Bremen, Cologne, Frankfurt a.M., Hamburg, Leipzig, Lübeck

Administrative Cities: Berlin, Brunswick, Breslau, Cassel, Dresden, Hanover, Karlsruhe, Königsberg, Magdeburg, Munich, Strasbourg, Stuttgart

Metal Industry and Mining Cities: Chemnitz, Dortmund, Düsseldorf, Essen, Mannheim, Nuremberg

Textile Industry Cities: Aachen, Augsburg, Barmen, Crefeld, Elberfeld, Mulhouse

Garrison Cities: Kiel, Mainz, Metz, Potsdam

Regional Centres: Danzig, Erfurt, Frankfurt a.O., Görlitz, Halle, Posen, Stettin, Wiesbaden, Würzburg

1 Missing: 1890: Aachen, Elberfeld, Frankfurt a.M., Mulhouse, Stuttgart, Würzburg

1900: Erfurt, Frankfurt a.M., Frankfurt a.O., Hanover, Metz, Mulhouse

1910: Erfurt, Frankfurt a.M., Frankfurt a.O., Halle, Potsdam

1912: Frankfurt a.M., Frankfurt a.O., Hanover, Potsdam

Obs. Data concerning either calendar year or fiscal year.

Table 27.

Gas consumption per inhabitant (m^3/yr) in German cities grouped according to geographical location in 1890, 1900, 1910 and 1912.

	In the Ruhr area	In Southern and South- Western Germany	In North- Western Germany	In Central Germany	In Eastern Germany	On Average	Tail probability	(N) ¹
Consumption of gas per inhabitant (m^3/yr)	1890 61.3 1900 67.0 1910 86.0 1912 88.9	54.0 67.0 82.6 86.3	51.5 58.3 92.2 95.2	59.9 67.1 86.7 85.6	36.9 44.5 70.9 74.3	52.7 61.9 84.0 86.5	0.057 0.103 0.481 0.617	(38) (38) (39) (40)

Sources: Calculated on the basis of Statistisches Jahrbuch Deutscher Städte, Jg. 3, p. 262; Jg. 11, p. 189; Jg. 19, pp. 786—787; Jg. 21, pp. 484—485.

Geographical location of the city:

In the Ruhr area: Aachen, Barmen, Cologne, Crefeld, Dortmund, Düsseldorf, Elberfeld, Essen

In Southern and South-Western Germany: Augsburg, Frankfurt a.M., Karlsruhe, Mainz, Mannheim, Metz, Mulhouse, Munich, Nuremberg, Strasbourg, Stuttgart, Wiesbaden, Würzburg

In North-Western Germany: Altona, Brunswick, Bremen, Cassel, Hamburg, Hanover, Kiel, Lübeck

In Central Germany: Berlin, Chemnitz, Dresden, Erfurt, Halle, Leipzig, Magdeburg, Potsdam

In Eastern Germany: Breslau, Danzig, Frankfurt a.O., Görlitz, Königsberg, Posen, Stettin

1 Missing: 1890: Aachen, Elberfeld, Frankfurt a.M., Mulhouse, Stuttgart, Würzburg

1900: Erfurt, Frankfurt a.M., Frankfurt a.O., Hanover, Metz, Mulhouse

1910: Erfurt, Frankfurt a.M., Frankfurt a.O., Halle, Potsdam

1912: Frankfurt a.M., Frankfurt a.O., Hanover, Potsdam

Obs. Data concerning either calendar year or fiscal year.

mentioning, in this connection, that in Stockholm also the electric tramway system was considered to be part and parcel of the large city image and therefore one had also to be constructed there.¹⁰⁵

Let us now return to the matter of alternative energy sources for lighting and power and to the question of the types of cities in which various forms of energy gained ground.

When investigating the *consumption of gas per inhabitant* in German cities the highest ratios were observed in the large commercial and administrative cities. In 1912 gas consumption was 138 cubic metres per inhabitant in Berlin, in Bremen 133.5, Stuttgart 122, Hamburg 120., Karlsruhe 119.9, Elberfeld 112.7, Wiesbaden 109.1, Dresden 108.2 and in Nuremberg 100.8 (cf. Tables 25. and 26.). The spread of the use of gas can be also measured by the length of the gas mains per inhabitant (cf. Table 18.).

When comparing the consumption of gas per inhabitant in German cities grouped according to geographical location it is evident, that the differences between various group means were no more statistically significant in 1900, 1910 and 1912. This implies that the geographical grouping did not explain the differences in gas consumption (cf. Table 27.).

The consumption of gas seems to have increased roughly in step with the size of cities. This is evident from the positive correlation¹⁰⁶ between the size of population derived from the data on German cities and the amount of gas consumed per inhabitant. The correlation was .44 in 1890, and .40 in 1910.

This link of gas consumption with the size of the city was also obvious to contemporaries. So in Helsinki for example the likely increase in gas consumption was among the arguments used in the presentation to the City Council. They pointed to the figures in German towns and cities where the consumption per inhabitant had increased as follows¹⁰⁷:

105. Larsson 1967, pp. 44.

106. The level of significance for correlation is .29 ($p=.05$), when $n=44$.

107. Helsingin kaupunginvaltuuston painetut asiakirjat 1907, n:o 6, p. 4.

Table 28.

Gas consumption in German cities. Recommendation employed by the Helsinki city authorities when planning of expansion of the municipal gasworks in 1907.

population of the city	gas consumption per inhabitant m ³ /yr
3,000— 10,000	46.0
10,000— 50,000	61.7
150,000—500,000	73.0
over 500,000—	88.8

Source: Helsingin kaupunginvaltuuston painetut asiakirjat 1907, n:o 6, p. 4.

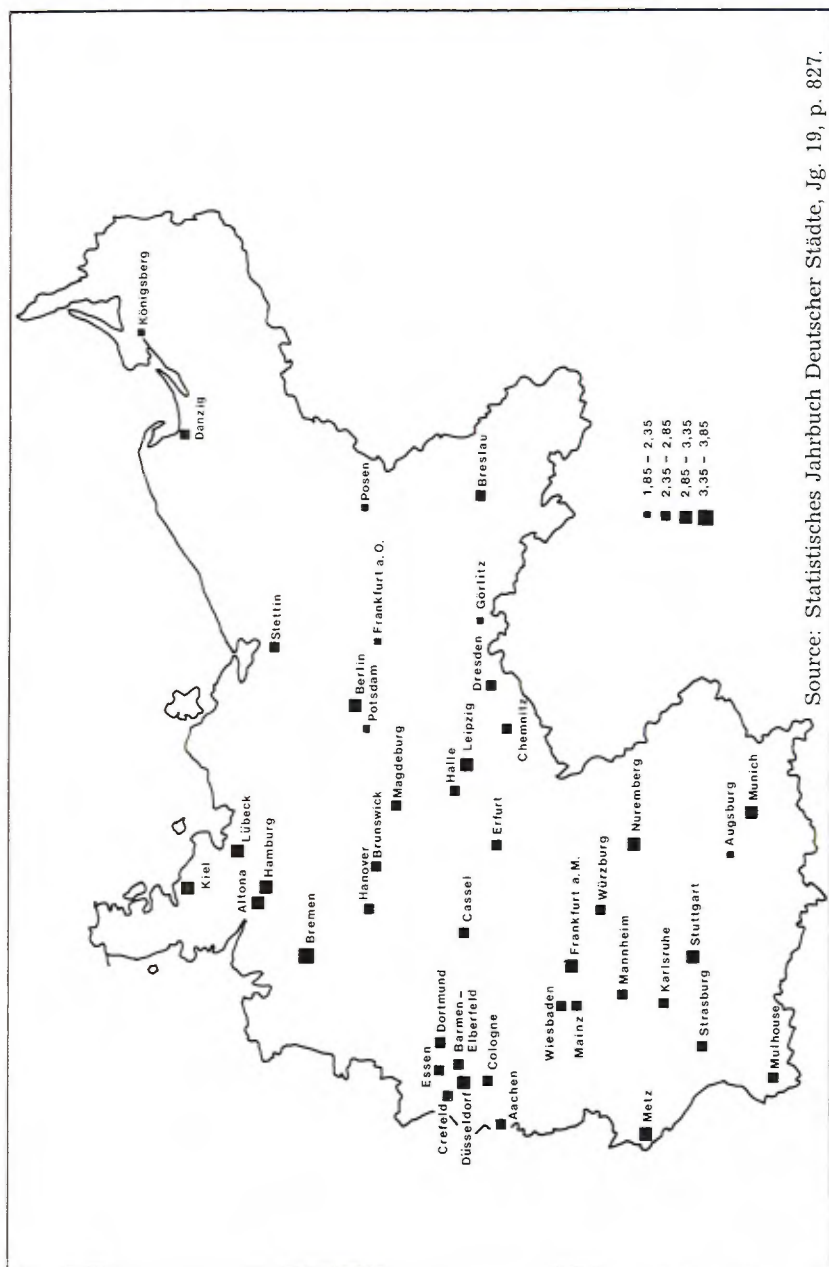
The analysis was taken further by *regression analysis* and Gas consumption was explored with step-wise regression analysis (Appendix IX, model 3). The gas consumption per inhabitant in 1912 was the dependent variable. The regression analysis selected as the independent variables daily wages¹⁰⁸ and the number of inhabitants. The square of the multiple correlation (R^2) was .34.

These results confirmed the above-mentioned analysis where we observed that the consumption of gas increased with population. From the list in Table 26. we can see that the consumption of gas per inhabitant was high in the commercial and administrative cities. On the basis of the influence of daily wages we can conclude that the gas consumption was linked to industrialised cities.

The amount of daily wages in the cities of this study in 1902 and 1912 is illustrated in two maps (see Map 2. and 3.).

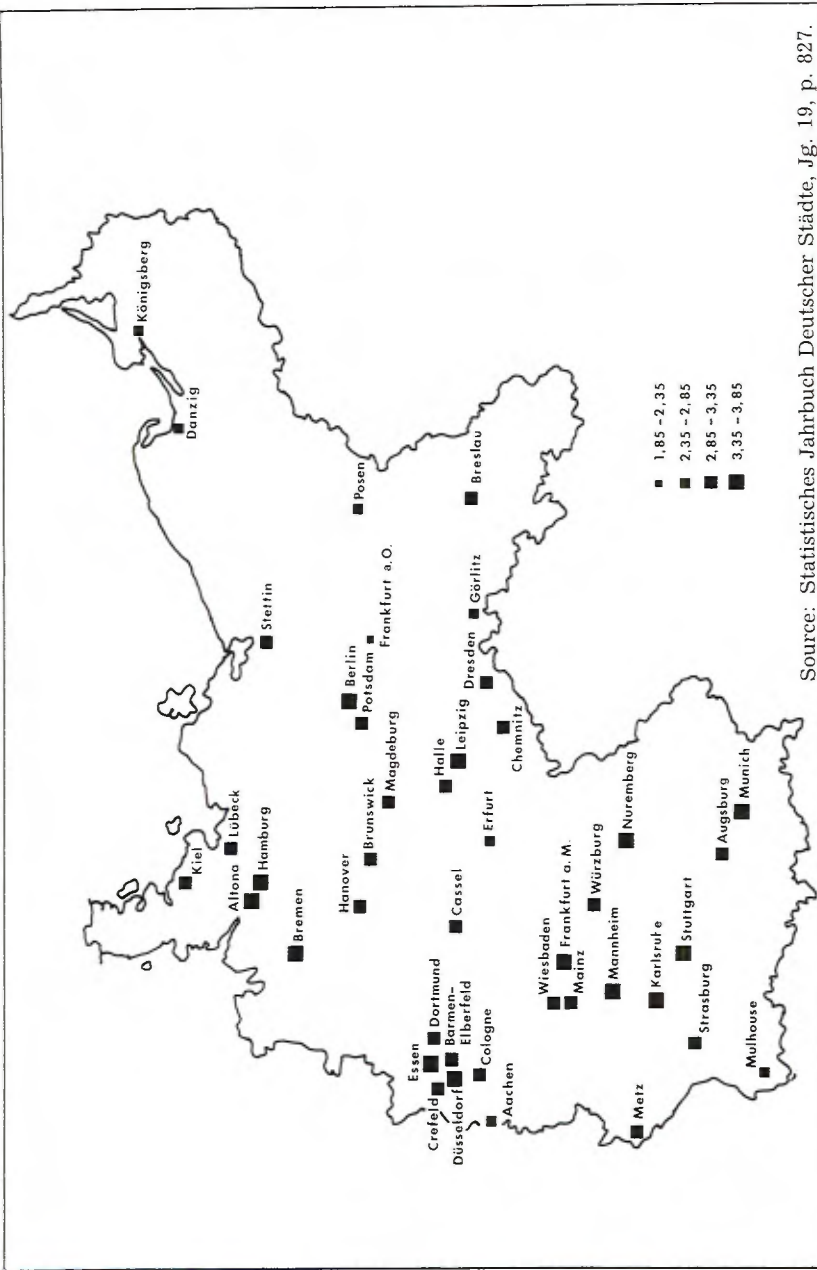
The use of electricity quickly became increasingly common not only in Berlin and Potsdam (consumption 43.9 kWh and 30.8 kWh per inhabitant in 1907) but also in the industrial cities of western Germany (see Map 4.) such as Dortmund (54.3

108. The variable "income level" was measured by daily wages (Ortsübliche Tagelöhne) in 1884, 1892, 1902 and in 1912. Stat. Jb. Deutscher Städte, Jg. 19, p. 823; Cf. Die ortsüblichen Tagelöhne, Städte-Zeitung 1911, p. 178.



Source: Statistisches Jahrbuch Deutscher Städte, Jg. 19, p. 827.

Map 2. Daily wages in 44 German cities in 1902 in German marks.



Source: Statistisches Jahrbuch Deutscher Städte, Jg. 19, p. 827.

Map 3. Daily wages in 44 German cities in 1912 in German marks.

kWh/inhabitant), Essen (35.2 kWh/inhabitant) and Elberfeld (29.9 kWh/inhabitant) as well as in Düsseldorf (25.4 kWh/inhabitant), Aachen (23.4 kWh/inhabitant) and Barmen (18.9 kWh/inhabitant). Other cities in the West and Southwest were also very active in putting electricity in use as the respective figures for these cities clearly demonstrate: Frankfurt am Main (36.8 kWh/inhabitant), Cologne (18.0 kWh/inhabitant), Mulhouse (104.6 kWh/inhabitant)¹⁰⁹, Wiesbaden (31.9 kWh/inhabitant), Mannheim (33.0 kWh/inhabitant) and Stuttgart (28.1 kWh/inhabitant). Among other cities in Central and Eastern Germany consumption was highest in Halle (20.8 kWh/inhabitant) and in Magdeburg (190.8 watts/inhabitant).¹¹⁰

The consumption of electricity increased rapidly. In 1911 the average of consumption of electricity in 44 German cities was higher (55 kWh/per inhabitant) than the highest amounts of consumption of electricity (excluding Mulhouse) in 1907.

In 1911 the consumption of electricity was highest according to applied classification in textile cities then in metal cities and smallest in regional centres (see Table 29.). The regional differences are rather big. According to geographical classification the consumption of electricity per inhabitant does belong significantly to the cities in the Ruhr Area and Southern and South-Western Germany (see Table 30.).

This result is clear also on the basis of *stepwise regression analysis* (Appendix IX, model 4). The dependent variable was the consumption of electricity (kWh per inhabitant in 1911).

In step-wise regression analysis the statistically most explanative combination of independent variables was the model where the city belonged to the group of textile industry cities (according to the applied classification), and its location was in Southern or South-Western Germany. This model explained 52 per cent of the variance of the dependent variable ($R^2 = .52$).

The introduction of electricity affected competition between the cities and led to an adjustment of their spheres of influence,

109. Mulhouse was producing and selling electricity for the surrounding communes. Cf. Passow 1923, p. 83. The greater part of consumption of electricity was for production. Stat. Jb. Deutscher Städte, Jg. 17, pp. 523, 557.

110. Stat. Jb. Deutscher Städte, Jg. 17, pp. 556—557.

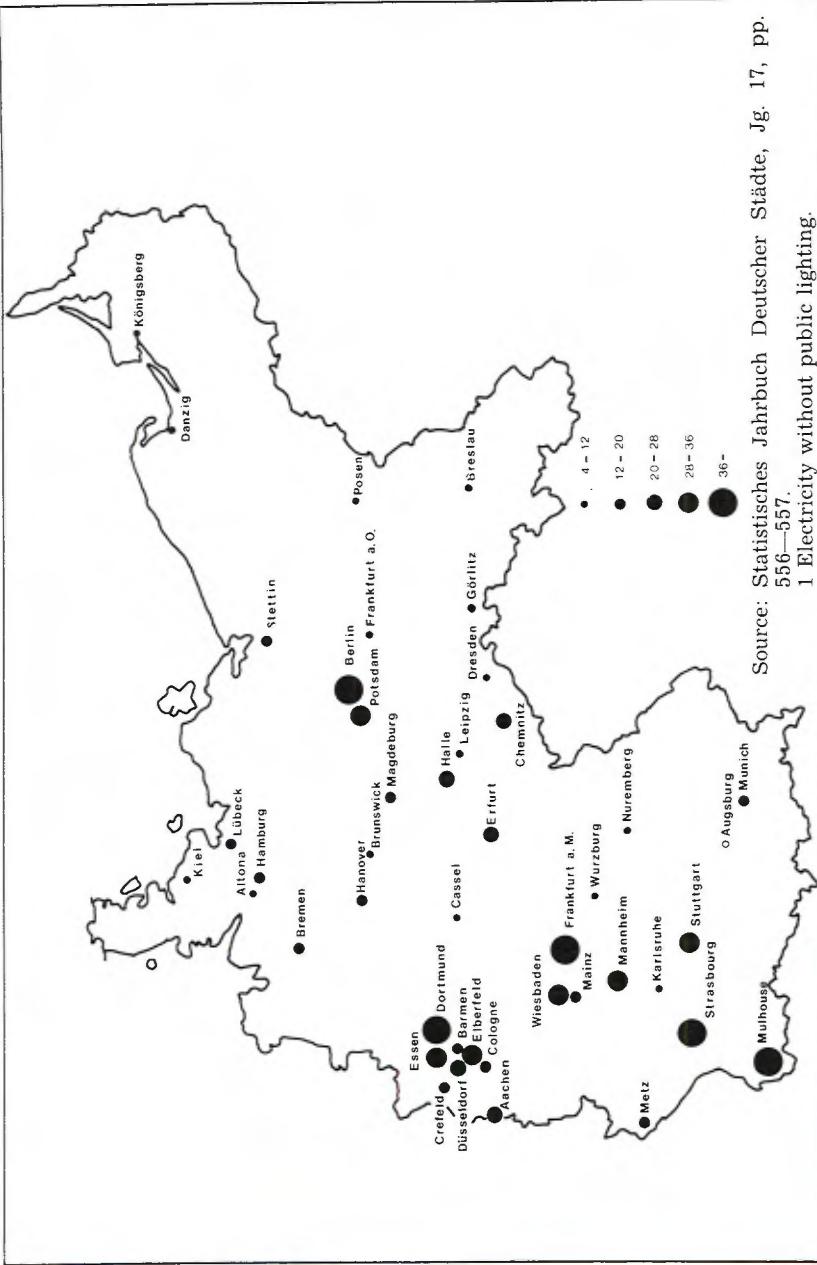


Table 29.
Consumption of electricity per inhabitant (kWh/yr)¹ in German cities according to the applied classification in 1911.

	Commer- cial Cities	Adminis- trative Cities	Metal Industry Cities	Textile Industry Cities	Garrison Cities	Regional Centres	On Average	Tail prob- ability	(N)
Consumption of electricity per inhabitant (kWh/yr)	1911 48.1	46.6	58.5	119.4	41.5	32.4	55.0	0.054	(44)

Source: Calculated on the basis of Statistisches Jahrbuch Deutscher Städte, Jg. 20, pp. 710—711.

Applied classification:

Commercial Cities: Altona, Bremen, Cologne, Frankfurt a.M., Hamburg, Leipzig, Lübeck
Administrative Cities: Berlin, Brunswick, Breslau, Cassel, Dresden, Hanover, Karlsruhe, Königsberg, Magdeburg,
Munich, Strasbourg, Stuttgart

Metal Industry and Mining Cities: Chemnitz, Dortmund, Düsseldorf, Essen, Mannheim, Nuremberg

Textile Industry Cities: Aachen, Augsburg, Barmen, Crefeld, Elberfeld, Mulhouse

Garrison Cities: Kiel, Mainz, Metz, Potsdam

Regional Centres: Danzig, Erfurt, Frankfurt a.O., Görlitz, Halle, Posen, Stettin, Wiesbaden, Würzburg

¹ Where data on the extent of the supply area was not available, production of electricity was examined in relation to population of the city concerned.

Table 30.

Consumption of electricity per inhabitant (kWh/yr)¹ in German cities grouped according to geographical location in 1911.

	In the Ruhr area	In Southern and South-Western Germany	In North-Western Germany	In Central Germany	In Eastern Germany	On Average	Tail probability	(N)
Consumption of electricity per inhabitant (kWh/yr)	1911 80.6	70.6	32.4	52.8	25.1	55.0	0.005	(44)

Sources: Calculated on the basis of Statistisches Jahrbuch Deutscher Städte, Jg. 20, pp. 710—711.

Geographical location of the city:

In the Ruhr area: Aachen, Barmen, Cologne, Crefeld, Dortmund, Düsseldorf, Elberfeld, Essen

In Southern and South-Western Germany: Augsburg, Frankfurt a. M., Karlsruhe, Mainz, Mannheim, Metz, Mulhouse, Munich, Nuremberg, Strasbourg, Stuttgart, Wiesbaden, Würzburg

In North-Western Germany: Altona, Brunswick, Bremen, Cassel, Hamburg, Hanover, Kiel, Lübeck

In Central Germany: Berlin, Chemnitz, Dresden, Erfurt, Halle, Leipzig, Magdeburg, Potsdam

In Eastern Germany: Breslau, Danzig, Frankfurt a. O., Görlitz, Königsberg, Posen, Stettin

1 Cf. Table 29.

especially when a city like Mulhouse started to sell electricity to its surrounding area. Particularly strong opposition was aroused by the 'Stinnesche Elektrizitätsmonopol' of RWE (Rheinisch Westfälische Elektrizitätswerk). For example the cities of Cologne, Munich, Gladbach, Neuss and Rheydt made an agreement that none of them would independently make contracts with RWE, and Bochum decided to establish an electricity works for the Association of Municipalities.¹¹¹

Public ownership made it possible to regulate the price of the main energy sources, i.e. gas and electricity, and thus promote municipal policies for encouraging industry. The cities of South-Western Germany were particularly active in this respect.

How the Nordic countries acquired their share of gas and electricity

The establishment of gas and electricity works in Sweden and Finland provides a good example of the rapid speed with which innovations were also disseminated in the Nordic countries. The Swedish cities tended to follow British examples when launching their gasworks in the mid 19th century. The first one was established in Gothenburg in 1846, which, even by European standards was quite early. Norrköping followed suit in 1852, Stockholm in 1853, Malmö in 1854 and the rest of the large cities in the 1850's and 1860's. As was common in most other countries the gasworks were at first owned privately but in the 1870's cities began to acquire them so that by 1910 only two of the total 31 gasworks were still in private hands.¹¹²

Gasworks were established in the large Finnish towns some ten years later than in Sweden, first in Helsinki and Viborg in 1860 and in Turku in 1862. As was the case in other European countries also, the Finnish towns themselves were able to acquire gasworks only after a concessionary period, normally some thirty years, had run out.¹¹³

111. Passow 1923, pp. 9—11.

112. Lagergréen 1912, p. 373.

113. Kallénautio 1983, pp. 316—318.

During the second half of the 19th century the improvement of street lighting and the expansion of the gas network emerged as a recurrent item on the agenda of Helsinki City Council. In 1872 a contract was signed for lighting some streets with turpentine lamps, invented by J. A. af Forselles, the number of which in the whole city totalled 168.¹¹⁴ During these decades particular attention was also paid to the diverse methods of measuring light in Britain, Germany and Sweden.¹¹⁵

German developments were being followed closely especially in the field of technology. In 1891 August af Schulten proposed the adoption, of the amylnacetet lamp as a unit of light, because of the excellent test results gained with it in Germany.¹¹⁶ Five years later it was suggested, referring to positive experiences achieved abroad, that a more advanced type of lamp (Auer lamp) should be introduced for the streetlighting in the city.¹¹⁷

In 1898 the Financial Department of the City of Helsinki appointed a Commission to investigate the future arrangements for streetlighting and gasworks in Helsinki. The Commission prepared first a cost estimate for a new gasworks and a municipal electricity works as well as of costs of the necessary wiring. A private gas company was asked to submit an estimated gas price and possible expansion plans. After hearing the representatives of the company the Commission decided to suggest the municipalization of gas supplies in line with what had happened in Turku, another of Finland's largest cities, following a trend to be observed in Sweden, Norway, Germany and increasingly also in Great Britain. Next the Commission undertook to compare the relationship of gas prices to the size of the population as well as the differences in the volume of gas consumption as between Helsinki and other cities and towns such as Turku, Stockholm, Lübeck, Stettin, Stralsund, Flensburg, Rostock and Kiel. On the basis of results it was possible to observe that the consumption of gas could increase considerably provided the price remained reasonable, as was the case in Flensburg, for example. In Turku and in Helsinki, on the other hand, the gas consumption per inhabitant was

114. Kertomus Helsingin kaupungin kunnallishallinnosta 1875—1878, p. 181.

115. Helsingfors stadsfullmäktiges tryckta handlingar 1876, n:o 30.

116. Helsingfors stadsfullmäktiges tryckta handlingar 1891, n:o 10.

117. Helsingfors stadsfullmäktiges tryckta handlingar 1896, n:o 28.



Figure 14.

The Helsinki city gasworks were municipalized in 1901. Photograph from 1912. (Collections of the Helsinki City Museum)

lagging behind the respective figures of other cities mainly because of too high pricing. The Commission concluded by suggesting the taking of the gasworks into municipal ownership and the construction of a new gasworks.¹¹⁸ Thus the gasworks in Helsinki was municipalised in 1901. Seven years later, in 1908, the managing director of a gas plant, Edward Cedercreutz, was invited together with German specialist companies to prepare a plan for the construction of a gas plant in Helsinki. The director of the Zürich gas plant, A. Weiss, was invited to comment on these plans.¹¹⁹

In the early years of the 20th century also the use of electricity in lighting was considered in Helsinki in relation to the examples of Stockholm, Berlin and Hamburg.¹²⁰ In cities, such as Viborg, where a decision had been made to switch as quickly as possible to the use of electricity the gasworks remained in private ownership for a long time. After the municipalization of gasworks the consumption of gas rocketed, due to the declining prices. But when electricity started, in the 1910's, to become a serious rival to gas so far as lighting was

118. Helsingfors stadsfullmäktiges tryckta handlingar 1898, n:o 20.

119. Helsingfors stadsfullmäktiges tryckta handlingar 1901, n:o 4.

120. Kertomus Helsingin kaupungin kunnallishallinnosta 1908, p. 56; Helsingfors stadsfullmäktiges tryckta handlingar 1908, n:o 22, pp. 2–23.

concerned, the Finnish gasworks also began to develop other uses for gas particularly in heating and cooking.¹²¹

The consumption of gas in Helsinki increased rapidly after the taking of the gasworks into municipal ownership in 1901, as the following figures indicate,

Index 1901=100		
1901	1,375,000 m ³	100
1902	1,496,000 m ³	109
1903	1,811,330 m ³	132
1904	2,149,900 m ³	156
1905	2,390,100 m ³	174
1906	2,912,660 m ³	212

Most rapid was the increase in the use of gas as a source of heating. "Nearly all new buildings within the radius of gas mains are provided with gas, and a number of older buildings also are connected with the municipal gas network every year." In 1906 the gas consumption per person in Helsinki (with 'nearly' 120,000 inhabitants) was 24.3 m³ a year, and 30.3 m³ a year if one includes only those people (some 96,000) living within the areas served by gas mains.¹²²

In 1909 the rates charged by Helsinki gasworks were compared with those demanded in Stockholm, Berlin and Hamburg, all of which used unit prices, as well as with ten other German cities, (viz. Bonn, Bremen, Cassel, Dresden, Düsseldorf, Kiel, Königsberg, Leipzig, Lübeck and Magdeburg) where the average price for heating gas was 12.55 pfennigs per cubic meter, for lighting gas 16.35 pfennigs per cubic meter and for electric lighting 58.5 pfennigs. In all these cities the gas and electricity works were municipally owned like in Helsinki, where the respective figures were 11 pfennigs per cubic meter for heating gas, 23 pfennigs per cubic meter for lighting gas and 46 pfennigs for electrical lighting. Because the consumption of lighting gas had decreased quite considerably

121. Kallénautio 1983, pp. 316—317.

122. Helsingin kaupunginvaltuuston painetut asiakirjat 1907, n:o 6, pp. 1—4.

from the level of the previous year (being 12 per cent less in August, September and October 1909 than at the same period in the previous year) measures had to be taken for halting this unwelcome trend and comparative data, which is presented above, was felt necessary for the re-estimation of the situation.

Consequently the Board of the Helsinki City Lighting Department proposed reducing the price of lighting gas from 30 pennies to 25 pennies (in Finnish currency) per cubic meter and this proposal was supported by the City Finance Department.¹²³ Drawing attention to the tough economic situation the City Council decided, however, to postpone a final decision until the completion of the new gas plant.¹²⁴

Regarding electricity the Nordic countries keenly followed continental developments as is well demonstrated for example by the active reporting of the latest innovations in the *Helsingfors Dagblad*, one of the leading dailies in Helsinki. This paper published in 1878 a lecture by C. W. Siemens in which he emphasized the advantages of electricity over gas.¹²⁵ Next year the paper introduced Edison's inventions related to the electric light bulb.¹²⁶

The progress of the idea of employing electricity was also an interesting process. The developers often were engineers who had been studying abroad. In the case of Helsinki the decisive impetus was given by a visit by Daniel Johannes Waden, a telegraph technician, to the great electricity exhibition held in Vienna in 1883. As a result of this he became convinced of the applicability of the idea to Finnish circumstances, and applied for and was granted a franchise to establish electricity works in Helsinki. The first electricity works started operations in Helsinki as early as in 1885, a relatively early date even by European standards. The undertaking soon got competitors, however, such as an electricity works established by an engineer who had studied in Hanover and Karlsruhe.¹²⁷

123. Helsingfors stadsfullmäktiges tryckta handlingar 1909, n:o 49.

124. Helsingfors stadsfullmäktiges tryckta handlingar 1909, n:o 59; 1909, n:o 60, appendix 1.

125. Helsingfors Dagblad 17.10.1878, 4.12.1887.

126. Helsingfors Dagblad 26.11.1879, 29.3.1879, 7.4.1879.

127. Oiva Turpeinen, *Energiaa pääkaupungille. Sähkölaitostointia Helsingissä 1884—1984*, Helsinki 1984, pp. 22—45.

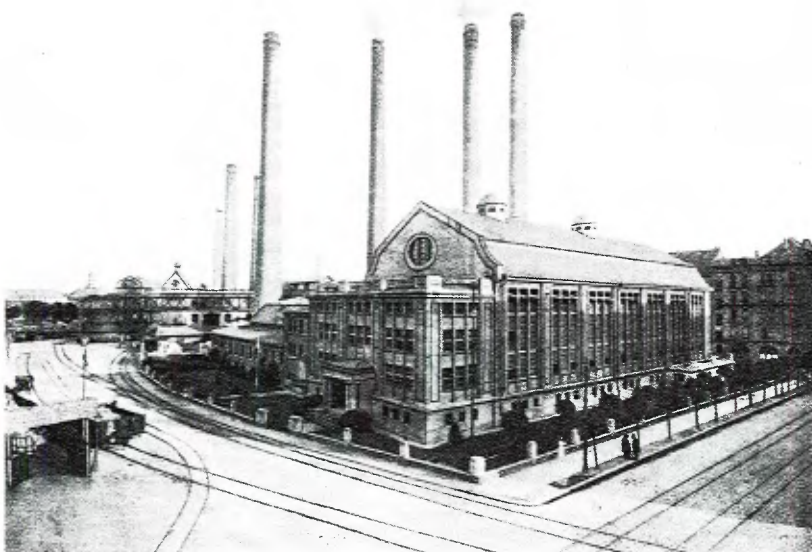


Figure 15.

The electrical plant of the city of Strasbourg served a wide area. (Max Schlenker (ed.), Die wirtschaftliche Entwicklung Elsass-Lothringens 1871 bis 1918, Frankfurt am Main 1931)

However, it is perhaps worth mentioning that these electricity experiments carried out in Helsinki were by no means the first in Finland. The Finlayson cotton mill in Tampere had its own electricity works which had begun to operate in 1882 and was one of the first not only in Finland but in Europe. The electricity works established in 1888 by the city of Tampere was the first municipal undertaking of its kind in the country.¹²⁸ By 1915 there were electricity works in all Finnish towns and cities.

The establishment of municipal electricity works had already been encouraged in the closing years of the 19th century by the fact that in neighbouring countries, and especially in Stockholm, successful experiments had been carried out on electric tramways and electric lighting. In 1899 a commission

128. Kallenautio 1983, pp. 317–318.

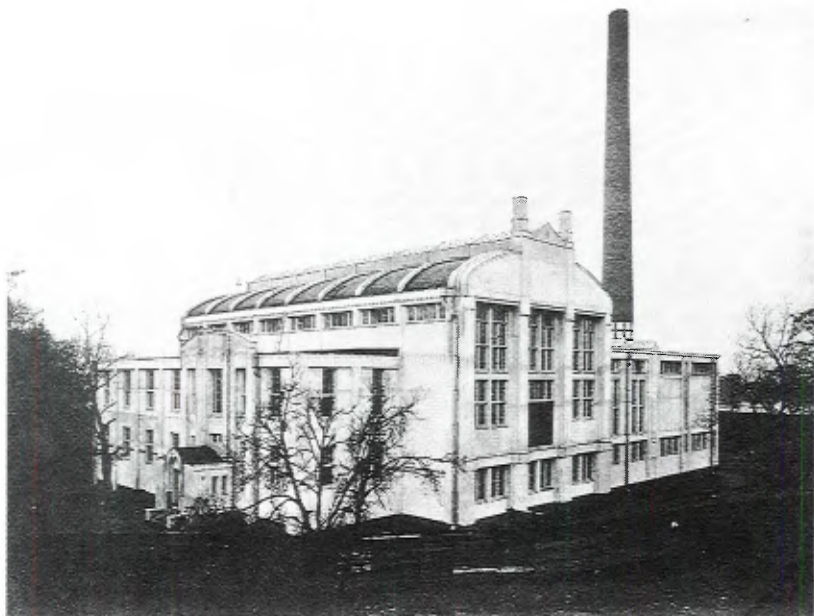


Figure 16.

The Helsinki electrical plant, designed by the architect Selim A. Lindqvist, was inaugurated on July 14, 1907 (Collections of the Helsinki City Museum)

presented its report comparing lighting in Helsinki, Vienna and Budapest, as well as in some German and British cities. The aim of the commission was to prove that electricity works do not cause health risks in the form of smoke gases.¹²⁹ Interest in the use of electricity in the service of the public had been stimulated even earlier. One reason for willingness of decision-makers to promote launching of municipal electricity works was the activity of private companies. In 1898 a private company running horse tramways applied for a licence for using electricity as a power source arguing that the use of animals had become far too expensive and examples were taken from American electric tramway systems.¹³⁰

129. Helsingfors stadsfullmäktiges tryckta handlingar 1899, n:o 8.

130. Helsingfors stadsfullmäktiges tryckta handlingar 1898, n:o 15.

The debate on the introduction of electricity in Helsinki continued into the new century. In 1901 references were made again to the examples provided by some large European cities, such as Stockholm, Copenhagen, Berlin and Hamburg.¹³¹ Next year, in 1902, plans were completed for an electricity works which would consist of a main station and several substations. A German electricity company, Allgemeine Elektrizitäts Gesellschaft, was invited to provide an estimate of the cost of the project and expert opinions were later sought on this estimate from, for example, Jordan in Bremen. During these discussions references were again made to the experiences of large European cities. This time the list included not only the names of Stockholm, Berlin and Hamburg but also Vienna, Bremen, Stettin, Munich, Dortmund, Dessau, Frankfurt am Main, Kristiania, Leipzig and Rotterdam.¹³²

Helsinki, in adopting foreign models of electricity provision, was interested not merely in being in fashion and in the fact that such innovations were likely to place the city in the vanguard of European progress. In 1904, for example, developments in this area were advocated in a City Council meeting on the grounds that electricity had proved to be the best source of power for small industries not only in a few large German cities such as Berlin but also in Zürich and Copenhagen.¹³³

The problem of the form of ownership was as urgent a question in Helsinki as in any other large city. The alternatives under consideration were whether to establish a municipal, private or a mixed company. On the basis of the practice prevalent in German towns and cities decision-makers in Helsinki tended to support the municipal ownership of electricity enterprises.¹³⁴

The planning of an electricity works was entrusted to E. Wikander, an engineer in Gothenburg. Formerly he had been employed by the Düsseldorf Electricity Works and was thus able to convey the experiences gained in German cities about the direct current system.¹³⁵ The city of Helsinki was, however, particularly active and endeavoured to acquire information

131. Helsingfors stadsfullmäktiges tryckta handlingar 1909, n:o 4.

132. Helsingfors stadsfullmäktiges tryckta handlingar 1902, n:o 29.

133. Helsingfors stadsfullmäktiges tryckta handlingar 1904, n:o 13.

134. Helsingfors stadsfullmäktiges tryckta handlingar 1904, n:o 7, pp. 11—35.

135. Helsingfors stadsfullmäktiges tryckta handlingar 1906 n:o 44, pp. 2—3.

also on the competing alternating — current system sending an engineer, Bernhard Wuolle, to investigate different alternatives. Wuolle visited Munich, meeting electrical engineer Oskar von Miller and interviewing Stadtbaurat Uppenborn. In Zürich he met the Director of the Municipal Electricity Works, Heinrich Wagner, and in Berlin he had talks with Professor Klingenberg, senior engineer Wallem and Professor Reichel about the advantages and money-saving qualities of the alternating current system.¹³⁶

Already two years earlier the leadership of Helsinki had become acquainted with the situation in Paris and had also sought advice from Professor S. Thompson, a London electrical technician, and from Eric Gerald of Luttich. At that time opinions were divided on which current system to choose. In his report Wuolle was inclined to support the alternating-current system because of encouraging opinions expressed in the Berlin consultations.¹³⁷ Support for this solution was drawn from the specialist literature (*Elektrotechnische Zeitschrift*, *Electrical World*, *Teknikern*) as well as from the statistics, published by the Vereinigung der Electricitätswerken, which contained data on German cities with a population of over 100,000 inhabitants.¹³⁸

In 1906 the City Council of Helsinki decided to establish an electricity works in the city, and it was constructed in 1908—1909 on a site owned by the municipal gasworks the total costs of the project amounting to 4,479,606 Finnish marks. From the very beginning the number of consumers exceeded the estimates to such extent that the extension of the works had soon to be considered, an extension that was eventually carried out just before the First World War, in 1912—1914. The dispute over which system was superior continued, however, at least till 1910, when the extension project was already on the agenda of the City Council of Helsinki.¹³⁹

136. Helsingin kaupunginvaltuuston painetut asiakirjat 1907, n:o 4, pp. 1—16.

137. Helsingin kaupunginvaltuuston painetut asiakirjat 1907, n:o 24.

138. Helsingin kaupunginvaltuuston painetut asiakirjat 1907, n:o 24 (*Electrical World*, December 1907, *Elektrotechnische Zeitschrift*, n:o 16, April 1907, *Teknikern*, December 1907).

139. Iisakki Laati, *Kunnalliselämä*, in: *Helsingin kaupungin historia IV:2*, Helsinki 1956, pp. 382—383; Helsingin kaupunginvaltuuston painetut asiakirjat 1910, n:o 63.

In Sweden electric lights were first used in 1885 in the coastal town of Härnösund on the Gulf of Bothnia, which was soon being frequently visited by observers and enthusiasts from the Finnish coastal towns. In general the Swedish electricity works were established from 1880 onwards and their municipalization was carried out speedily.¹⁴⁰

From the different phases of the various gas and electricity projects in Helsinki at least one fact becomes rather obvious, i.e. that large cities form the reference group for Finnish authorities. When searching for the best possible expertise they travelled, for example, to Dresden, Munich and Berlin, cities whose population exceeded that of Helsinki by many times, rather than to cities similar in size to their own, which would of course be considered, in European terms, somewhat small for major cities. Also the people whom Finns tended to consult were often advisors on their particular specialities to a number of other cities in addition to their own home towns. Thus for example the electrical engineer Oskar von Miller from Munich acted as a technical advisor to the city of Strasbourg from the 1890's to 1918.¹⁴¹

Tramways

As for the construction of tramway systems Britain was in general ahead of Germany. By 1870 it was obvious that horse trams were about to be adopted on an extensive scale in British cities, and companies were competing for franchises to operate on public streets. Parliament was opposed to direct municipal operation but cities were given the authority to construct tram tracks and to lease them for twenty-three years to a single company which was obliged to make considerable payments to the city and to observe regulations on fares and the quality of

140. Kallenautio 1983, pp. 317—318.

141. Blaum 1931, pp. 233—244. Strasbourg was a model city for the towns in Alsace Lorraine. It was in Strasbourg that the idea of "gemischt-wirtschaftliche Unternehmungen" was developed. Alfred Loewe, *Die Elektrizitätswirtschaft*, in: Max Schlenker (ed.), *Die wirtschaftliche Entwicklung Elsass-Lothringens 1871—1918.*, *Das Reichsland Elsass-Lothringens 1871—1918*, Band I, Frankfurt a.M. 1931, pp. 232—234.

service. Fares were not to exceed 1 penny per mile, with further concessions for workmen's travel. When the system extended, the adjustment of the lease led to prolonged recriminations between the cities and the operating companies. Parliamentary opposition to municipal involvement had weakened by 1890 and, with the expiry of the leases, municipalizations began in 1894.¹⁴²

So far as the introduction of electric tramways was concerned the large European cities again formed a reference group for the Nordic towns and cities. In Stockholm the first electric tramway line was opened in 1895 in Djursholm. Among the Swedish pioneers in this field was also the city of Norrköping, which was the first Swedish town to construct a tramway system, and its example was followed by Hälsingborg in 1903 and Uppsala in 1906.¹⁴³ Nor was Finland slow to adopt the new method of transport. Already in 1889 Omnibusaktiebolaget, a private tramway company, submitted an application to the Helsinki City Council for permission to construct electric tramlines in Helsinki and supported their application with a description of the functioning of an electric tramway system run by an American company, Thomson-Houston. The Municipal Engineer, Ehrström, was prepared to accept this application but because the subcommittee appointed by the City Council was not equally convinced by it the whole project came to nothing at that stage.¹⁴⁴

There was a period at the turn of the century when the municipalization of the tramways was widely debated, for example in *The Municipal Journal*. The 1870 Tramways Act in Britain had chiefly been concerned with private enterprises and, indeed, had stipulated that municipalities should not directly operate tramway systems. They were, however,

142. The first tramway was built in New York 1832 for transport, 1852 for passengers. In Europe the first ones were in Paris 1854, London 1861, Copenhagen 1862, Haag 1863, Berlin 1865, Wien 1867 and Bruxelles 1869; Report of the Joint Select Committee of the House of Lords and the House of Commons on Municipal Trading; together with the Proceedings of the Committee, Minutes of Evidence and Appendix, 1900, VII, British Parliamentary Papers; J. R. Hume, *Transport and Towns in Victorian Scotland*, in: George Gordon and Brian Dicks (eds.), *Scottish Urban History*, Aberdeen 1983, pp. 202—204.

143. Lagergrén 1912, pp. 280—283.

144. Helsingfors stadsfullmäktiges tryckta handlingar 1890, n:o 16.

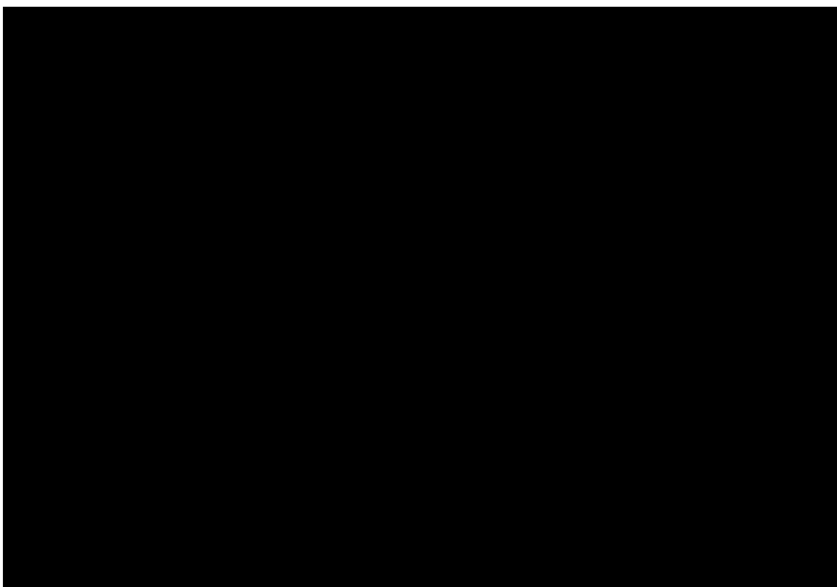


Figure 17.

The Glasgow tramways were an example of succesful municipalisation. (London June 28, 1894)

empowered to purchase private systems after 21 years, at existing structural value, and, because of their interest in the highway, they were allowed to regulate the amount and course of traffic. By 1895 33 of the country's 124 tramway systems had been constructed by local authorities and this represented a capital investment of 2 million pounds. Ten years later, in 1905 161 of the 276 systems were owned and run by local authorities and their total capital amounted to nearly 28 million pounds. This dramatic rise in investment had two causes: systems were extended from 264 to 1,196 miles of line and were also electrified. This expansion continued in the following years so that by 1913 some 1,500 miles of tramway lines were owned by local authorities. Municipal ownership embraced 63 per cent of lines, 71 per cent of capital expenditure, 73 per cent of vehicles, 75 per cent of car miles to run, 80 per cent of passengers carried, and 81 per cent of electricity consumed.¹⁴⁵

145. Albert Shaw, *Municipal Government in Great Britain*, New York 1895, pp. 204—208; C. A. Oakley, *The Last Tram*, London 1962, p. 20; Tom

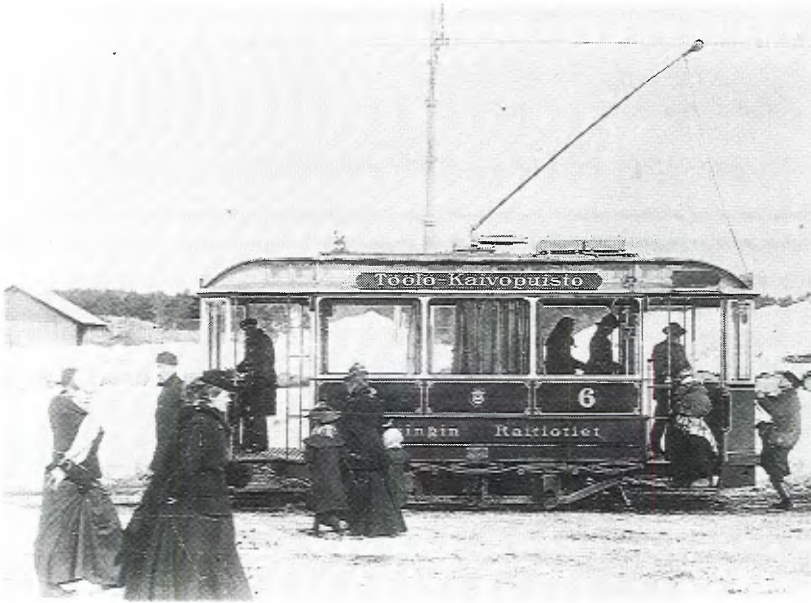


Figure 18.

In 1900 the Helsinki tramways began their electric tram service. (Collections of the Helsinki City Museum)

The issue of *transferring tramways to municipal ownership* was debated intensively in progressive circles all over the world in the 1890's, and the municipalization policies of the city of Glasgow were used as a successful model both on the continent and in America.

"For American reformers Glasgow's tramways embodied the values of an ideal urban society. Like many other British cities Glasgow had extended control of public services: gas, water, electricity, housing and even telephones... In 1894 Glasgow had municipalized her tramway system; being the first major city in the world to undertake this public

Hart, *Urban Growth and Municipal Government: Glasgow in a Comparative Context, 1846—1914*, in: Anthony Slaven and Derek H. Aldcroft (eds.), *Business, Banking and Urban History, Essays in honour of S. G. Checkland*, Edinburgh 1982, p. 197; Andrew Gibbs, *Glasgow, The Making of a City*, Glasgow 1983, p. 121.

service. . . . Between 1896 and 1903 the Glasgow track mileage was doubled to 130 miles, the number of passengers annually carried more than doubling to reach 177,1 million; and, although fares were reduced, receipts were almost doubled from 328,000 pounds to 653,000 pounds."¹⁴⁶

For Americans the tram was a symbol of democracy: it made for a greater mobility of workers, and, by making less congested housing possible, improved the health of a seemingly stable and ordered society.

Indeed, by the beginning of the First World War over 330 million passengers were being carried in Glasgow and the fare charged was normally a penny or less. Annual profits were normally quite healthy, varying from 83,000 pounds in 1896 to 68,000 pounds in the year 1911: and in 1910 the reserve funds more than covered the whole capital of nearly 4 million pounds. To meet an increasing demand on services, the number of cars rose from 220 to over 600 in 1904, when 90 per cent of them were built in municipal workshops. The morale of the workforce was improved at the same time by better wages, shorter hours and various benefit schemes; and their number had risen in thirty years from 92 in 1894 to almost 9,000 in 1914. According to American observers,

"The public enjoyed a comfortable, frequent and cheap service; Although trams were restricted in speed to eight miles an hour, a two or three minute service was maintained even on outlying routes. The junction of Jamaica Street and Renfield Street was allegedly the busiest in the world — On weekdays 466 cars an hour passed, 516 on Saturdays."¹⁴⁷

Glasgow was proud of her municipal enterprise, efficiency and profit: and the surplus, which was applied to the Common

146. Bernard Aspinwall, *Glasgow trams and American Politics*, in: *Scottish Historical Review*, 56, 1977, pp. 64—65. It was a private American entrepreneur Francis Train who built a first tram line in London and proposed to build such also in Glasgow in 1861—62. His proposal was refused by city authorities, Shaw 1895, p. 127.

147. Aspinwall 1977, p. 65, Quotation from: *The Report of the National Civic Federation: Municipal and Private Ownership and Operations*, New York 1907.

Good Fund benefited the whole city.

When presenting the succesful municipalization policies carried out in Glasgow the *London (the Municipal Journal)* referred to the experiences of that city¹⁴⁸ but equal attention was also paid to the progress in municipalization occuring in other cities, such as Newcastle.¹⁴⁹ The journal also followed the exciting competition in Glasgow between the Tramway Company and the Tramway Committee of the Corporation.

"The success of Glasgow's municipal tramways continues. The weekly income is now up to 4,100 pounds, which compares very favourably with the returns of the tramways company. Not only has the Corporation retained all the tramway traffic but has considerably increased it. This result has been obtained too by charging lower fares than the tramway company."¹⁵⁰

In 1899 The London Tramways Company was transferred to the County Council and was its first great remunerative enterprise.

"This is larger than that of any town in the United Kingdom unless Glasgow be a mile or two more in mileage."

wrote the *Municipal Journal*, commenting on the acquisition on January 5th 1899.¹⁵¹

The tramway networks in 1912 were densest in Scottish and Irish towns when measured by length of lines per area while

148. "Glasgow Municipal Tramways. The Glasgow Corporation Begins to Work its own Tram Cars on Sunday. — Notable Experiment in Collectivism. — How the New Department was Organised", London 28.6.1894, pp. 401—402;

Glasgows Tramways. Municipal Control brings safe and Comfortable cars, London 1.6.1893, p. 278.

149. Newcastle tramways. Victory for Municipalisation, *Municipal Journal* 24.2.1899.

150. A Lesson to London, London 6.9.1894, p. 563; William Smart, Glasgow and its Municipal Industries, *Quarterly Journal of Economics*, 9, 1894—5, pp. 188—194.

151. The *Municipal Journal* 5.1.1899, p. 19.

Table 31.

Length and capital expenditure of tramways on 31st December 1912 and number of passengers carried 1912—1913.

	Length of line open for public traffic km	Number of passengers per car km	Number of passen- gers per inhabitants	Length of line (km) /city area (100 ha) excl. tidal- water	Proportion of working expenditu- re to gross receipts per cent
London	237.70	5.94	113	0.8	67
Birmingham	99.10	6.40	158	0.6	64
Liverpool	102.80	6.66	178	1.5	64
Manchester	120.14	6.25	259	1.4	63
Sheffield	64.30	7.46	207	0.7	57
Leeds	87.15	6.43	200	1.0	62
Bristol ¹	49.86	5.61	146	0.7	82
Newcastle	46.56	6.83	194	1.4	53
Cardiff	27.44	6.78	154	1.1	56
Swansea	19.89	5.31	93	0.9	55
Glasgow	165.66	8.34	300	3.2	58
Edinburgh	40.16	5.99	201	0.9	51
Dundee	24.05	8.33	108	1.2	60
Aberdeen	23.04	7.18	123	0.9	53
Belfast	79.70	6.14	149	1.3	57
Dublin	79.70	4.61	187	2.5	55

Source: Calculated on the basis of Comparative Municipal Statistics, Vol. 1, 1912—13 Table 69, pp. 90—91, Table 70, pp. 92—93.

¹ The tramway expenditure is not separable from that of the carriage department.

the greatest number of passengers per inhabitant was carried in Glasgow and Manchester (see Table 31.).¹⁵²

In Germany Düsseldorf was in 1892 the first large city to transfer the local tramway system to municipal ownership. Between that year and 1900 many other towns, Barmen and

152. The low figures for London due to the fact that tram way lines were almost entirely built on the south side of the river Thames. On the north side the passenger traffic was carried by omnibuses and the underground railway, which was opened in 1863. London Statistics 1903—1904, Vol XIV, pp. 140—146.

Bochum in 1894 being among the first, either bought up existing companies or built their own tramways. In 1894 the total length of electric line was 107 miles,¹⁵³ in 1911 there were 2,700 miles.¹⁵⁴ According to Dawson's calculations the number of municipal undertakings in 1912 was 132 and 95 of those were in Prussia. The largest of the *municipal tramway systems* were now those of Dresden with a length of 71 miles, Munich 57 miles, Frankfurt am Main 49 miles, Cologne 49 miles, Düsseldorf 45 miles, Breslau 32 miles, Nuremberg 26 miles, Königsberg 26 miles and Chemnitz 23 miles.¹⁵⁵

William Harbutt Dawson commenting on the tramway systems in Germany, noted that:

"On the whole the towns which own and work tramway systems have laid more stress upon the provision of ample and efficient transport services than upon securing large profits. The fares are as a rule, moderate and cause little complaint. There are two systems of rates: the uniform fare and the zone or sectional system."¹⁵⁶

Of German cities the commercial and administrative centres in particular were among the first to promote and construct tramway systems (see Table 19.). In 1900 the length of the tramway lines per inhabitant was greatest in just such cities, such as Hanover, Wiesbaden, Strasbourg, Dresden and Leipzig. Among industrial cities the tramway construction fever was caught also by textile cities, which being already in the stage of slackening growth were well suited for this kind of infrastructural development.

From the Table 32. we can conclude that the length of the tramway lines (private companies and municipal ownership) per inhabitant was greatest in 1890 in the commercial cities and textile cities. The differences between city groups evened at the turn of the century. The construction of tramways seems to be connected with the role and the industrial structure of the city, not with the geographical location of city. The

153. See e.g. Stat. Jb. Deutscher Städte, Jg. 19, p. 272.

154. Stat. Jb. Deutscher Städte, Jg. 6, p. 74; Dawson 1914, p. 232.

155. Stat. Jb. Deutscher Städte, Jg. 20, pp. 255—256; Dawson 1914, p. 232.

156. Dawson 1914, pp. 232—233.

Table 32.
Tramlines (kilometres/100,000 inhabitants) in German cities according to the applied
classification in 1890, 1900 and 1910.

	Commer- cial Cities	Adminis- trative Cities	Metal Industry Cities	Textile Industry Cities	Garrison Cities	Regional Centres	On Average	Tail pro- bability	(N) ¹
Tramwaylines	1890 21.50	17.91	9.21	19.27	14.46	12.75	16.34	0.075	(36)
kilometer/ 100,000	1900 31.61	47.17	29.10	29.91	17.12	20.66	31.82	0.005	(41)
inhabitants	1910 33.52	40.79	31.35	45.93	33.78	31.25	36.46	0.528	(44)

Sources: Calculated on the basis of Statistisches Jahrbuch Deutscher Städte, Jg. 2, p. 154; Jg. 11, pp. 214—217; Jg. 19, pp. 268—271.

Applied classification:

Commercial Cities: Altona, Bremen, Cologne, Frankfurt a.M., Hamburg, Leipzig, Lübeck

Administrative Cities: Berlin, Brunswick, Breslau, Cassel, Dresden, Hanover, Karlsruhe, Königsberg, Magdeburg, Munich, Strasbourg, Stuttgart

Metal Industry and Mining Cities: Chemnitz, Dortmund, Düsseldorf, Essen, Mannheim, Nuremberg

Textile Industry Cities: Aachen, Augsburg, Barmen, Crefeld, Elberfeld, Mulhouse

Garrison Cities: Kiel, Mainz, Metz, Potsdam

Regional Centres: Danzig, Erfurt, Frankfurt a.O., Görlitz, Halle, Posen, Stettin, Wiesbaden, Würzburg

1 Missing 1890: Berlin, Düsseldorf, Hamburg, Mainz, Mulhouse, Posen, Stettin, Würzburg

1900: Altona, Barmen, Elberfeld

construction of tramway systems had two kind of effects: on the one hand they made agglomeration possible and on the other hand they enabled the planners to expand the network to wider areas. When employing tramways it was possible to plan for example special living areas for the working population and to allocate some other areas for industry.

Co-operation over municipal boundaries took place in the Ruhr area where a network of tramways was created to cover vast areas. The need for a quicker means of continuous communication between adjacent towns led in the industrial districts of West Germany to the formation of multi-communal companies for the joint construction and working of tramways and light railways serving wide areas. Such were the Rhineland-Westphalian Railway Company in Düsseldorf and the Upper Rhineland Railway Company of Mannheim. In some cases the Kreis Diets, the regional representative bodies, stepped in and constructed and worked tramways intended to carry inter-urban traffic.¹⁵⁷ Alongside the tramways also underground systems, city railways and omnibuses were introduced as compensatory forms of public transport.

As regards *infrastructural services* in different types of cities one can conclude that *the incidence of services is related to needs deriving from the city's industrial structure*. Thus the cities in the Ruhr area were leaders in water consumption and the innovative textile cities were among the first to switch to the use of electricity and to construct electrified tramway lines, which seem to have been a part of the administrative cities' image. This trend can be observed for example in reports of planners who used European large cities as models when planning a tramway system for the city of Helsinki. Of the infrastructural services the consumption of gas is particularly connected with large cities and commercial centres.

The public ownership of infrastructural services facilitated the regulation of industrialization policies, keeping for example industrial tariffs at a different level from those levied on private consumers. By creating the infrastructure it was also possible to control the planning of various parts of cities. In adopting new infrastructural services, and any other services, it

157. Reulecke 1985, pp. 82—86.

was important how big a financial risk decision-makers were prepared to take and what their capacity was to forecast future developments. The cities of South-West Germany, such as Frankfurt am Main, Düsseldorf and Cologne, were particularly successful at the latter.

12. Cities as Promoters of Health Care Services

General

With health care services the quality of life can be improved. Here the aim is to examine the supply of health care services and the network which provides it, that is the totality of those persons, institutions and material resources which function in order to improve the standard of health, their aim being to maintain, protect and re-establish the human being's health as well as to minimize the effects of illnesses and injuries.¹

During the 19th century and at the turn of this century the discussion of health care included not only debates on actual treatment of diseases and illnesses and on medical services but also debates on hygiene in general. At the international level the forums for this discussion were provided by various congresses (e.g. Copenhagen 1888 and Paris 1889) and exhibitions (e.g. Berlin 1883, Edinburgh 1886, Vienna 1887) on hygiene and at the national level the discussion was maintained by different health care associations, like the *Deutsche Gesellschaft für öffentliche Gesundheitspflege* in Germany and the *Public Health Medical Society in England*. In addition to conferences, associations and joint activities by medical practitioners various kinds of publication activities assumed proportions that could hardly have been forecast. The following topics began to emerge as discussion themes in

1. R. Kohn and K. L. White (eds.), *Health care. An International Study*, London 1976, p. 3.



Figure 19.

Karl Müller's Volksbad (people's baths) in Munich by the Architect K. Hocheder. (K. Singer, Hygiene & soziale Fürsorge in München. Eine Auswahl von Einrichtungen in Bild & Zahlen, Munich 1907)

congresses: housing conditions, water supply and sewerage, sewerage technology, refuse collection and disposal, street cleansing, food inspection and in particular the inspection of meat and milk, as well as the running of slaughterhouses and cattle markets.² At that time all kinds of information campaigns relating to conditions in factories and personal

2. See e.g. Reports from the International Congresses of Hygiene and Demography. VI Internationaler Kongress für Hygiene und Demographie zu Wien, Vienna 1887; Huitième Congrès International d'Hygiène et de Démographie à Budapest 1894, Budapest 1895, 1896; Albert Palmberg, A Treatise on Public Health and its Applications in Different European countries (England, France, Belgium, Germany, Austria, Sweden and Finland), 2nd ed. London 1895; Budapest Municipal and Health Exhibition, The Municipal Journal 26.11.1909; Bericht über den XIV. internationalen Kongress für Hygiene und Demographie, Berlin 1907, 4 Bd., Berlin 1908.



Figure 20

Karl Müller's Volksbad. Interior: Women's swimminghall. (K. Singer, Hygiene & soziale Fürsorge in München. Eine Auswahl von Einrichtungen in Bild & Zahlen, Munich 1907)

hygiene were common: in this connection attention was also paid to the improvement of bathing facilities and to the establishment of baths, both for the general public and in connection with schools. The large cities also began to establish separate disinfectant centres which attracted interested visitors from near and far.³

The connection between insanitary environment and the spread of diseases was known to the Middle Ages but due to the intensive urbanization process the issue was transformed

In Germany the Vorstand des Deutschen Städtetages had a Commission for collecting statistical information about the largest German Cities. Heinrich Silbergleit (ed.), *Statistische Beiträge zur Frage der Lebensmittelvesorgung in deutschen Großstädten*, Berlin 1919.

3. Marjatta Hietala, *Diffusion of Innovations, Some examples of Finnish Civil Servants' Professional Tours in Europe*, *Scandinavian Journal of History*, Vol 8, No 1, 1983, pp. 23—36.

into an acute problem requiring concrete actions from the decision-makers. Observations on housing conditions were often the point of departure for writers in the 19th century (Chadwick, Booth, Jephson). Overcrowding came, nevertheless, as a surprise to observers. The Medical Officer of Health of St. Giles, in London described such a dwelling in mid-1850's

"The houses whose rooms are occupied by single families were last year in a condition of squalor and overcrowding which is difficult to conceive surpassed . . . The air of these rooms was unbearable to a visitor, and to open the window was only to exchange one foul emanation for another."⁴

As a matter of fact in Great Britain the Asian cholera epidemic in 1831 was the first event which directed attention to the necessity of public health services, but it was not until the 1880's that health conditions in the poorer parts of the British cities began to improve. In 1849, for example, because of the inferior quality of water, cholera killed three times more people in southern parts of London than in the northern parts of the city. It was, indeed, the fear of cholera which caused the largest cities to establish special Boards of Health to undertake measures of prevention and isolation. The decisive impact was provided by the activities of private persons, such as Charles Booth, who tackled living conditions among the poorest groups of the population. Booth himself measured this 'improvement' more in general attitudes, taking note of any improvements in people's expectations and in society's sentiments about what level of poverty and personal degeneracy would be admissible.⁵

In the course of this international discussion the causes of the onset of infectious diseases were often sought in the environment — as in the quality of ground water by Pettenkofer. The discovery of bacteria as a source of a number of diseases helped to vanquish doubts concerning the damaging

4. Henry Jephson, *The Sanitary Evolution of London*, London 1907, pp. 108—109; Hasluck 1936, pp. 17—18.

5. Jephson 1907, pp. 72—73; Charles Booth, *Life and Labour of the People in London*, Final Volume, Notes on Social Influences and Conclusion, London 1903.

effects of an unsatisfactory environment.⁶ However, at the turn of the century there was still some dispute about the detrimental impact of urbanization, for example the effects of the lack of natural light in the onset of infectious diseases were still being debated vehemently.⁷

In the German empire the Imperial Board of Health was formed in 1876 to assist the Imperial Ministry of the Interior operating upon a national scale and its four sections dealt with such important matters as water supply, sewerage, disinfection and the disposal of trade effluents. The Imperial Board of Health advised local authorities on questions of sanitation, and the results of its own continuous investigations were placed at the disposal of the authorities in the form of reports and statistics. But neither the Imperial Board of Health nor the subordinate Council of Health possessed any compulsory powers to complete its findings to become part of public health policy.⁸

In the German States public health questions came under either the Ministry of the Interior or a department of the Ministry for Ecclesiastical, Educational and Medical Affairs. The medical department of the Prussian Home Office organized all measures for the combating of infectious and come other diseases and examined local schemes of water supply and sewerage as well as generally advising local authorities on matters relating to public health and sanitation. Questions of public health and sanitation in the German cities at the end of the 19th century remained, as in France, matters for the police. Later all the larger states the municipal authorities were required to form committees for the purpose of co-operating in the administration of the public health laws. So in Prussia, for example, a law of September 16th 1899 stipulated that Standing Health Committees should be appointed in all communes with more than 5,000 inhabitants. It was the duty of

6. See for example Friedrich Renk, *Die Luft*, in: *Handbuch der Hygiene und Geschlechtskrankheiten*, Leipzig 1886 and Friedrich Prinzing, *Die mannigfachen Beziehungen zwischen Statistik und Medizin*, *Allgemeines Statistisches Archiv*, Bd. VI, 1902, pp. 1—2.

7. Review of the lecture by Dr. Witt at the Technical Institute in Berlin, *Städte-Zeitung* 22.11.1910.

8. C. Goesch and J. Karsten, *Die Gesetzgebung betreffend das Gesundheitswesen im Deutschen Reiche*, Berlin 1888; Dawson 1914, pp. 163—164; Scurfield, *A Clean Milk Supply*, *The Municipal Journal* 2.3.1906.



Figure 21.

Light and fresh air were regarded as important in the care of the sick and convalescent. Hospital in Munich. (K. Singer, Hygiene & soziale Fürsorge in München. Eine Auswahl von Einrichtungen in Bild & Zahlen, Munich 1907)

these committees to become familiar, by inquiries and inspections, with the sanitary conditions of their districts, to try to cure bad sanitary conditions, to support all sanitary measures taken by the police authority, and acting in accord with the District Medical Officer, to give opinions on questions relating to public health. Particular attention was paid by the committees, as directed by the law, to the condition of dwelling houses and habitations in general, the cleanliness of the streets and public places etc, to the water supply in all its branches, the pollution of water courses, trade in food stuffs, and to public abattoirs⁹ as well as to the relation of industrial

9. In 1911 39 of 41 cities with over 100,000 inhabitants had an abattoir of their own Dawson 1914, p. 191; Palmberg 1895, p. 355; On a comparative note: In Helsinki the inspection of meat became obligatory in 1914, Åström 1956, p. 211.

undertakings to public health, the condition of schools, the condition of the poor and sick and of institutions for their care, first aid arrangements, bathing and swimming establishments, cemeteries and mortuaries.¹⁰ At the turn of the century experience in the largest cities proved that sanitary police should be separated from the state policing system in all cities and towns. At the Dresden city exhibition, in 1903, Dresden, Breslau, Hamburg and Halle put on display the achievements of their welfare polices and medical care and the city of Dresden was presented as a model.¹¹

Since the Middle Ages there had been special medical practitioners employed by communes to treat the poor and to combat infectious diseases. At the end of the 19th century the city medical officers became responsible for the administration of the public health service though some part of the public welfare services were handled by District Medical Officers, employed by each state, and by health care authorities. Their duties included the combatting of infectious diseases, the supervision of junior health care personnel, pharmacies and municipal health care institutions as well as health control in schools. In the eastern parts of Prussia these tasks were carried out by special Sanitary Police (*Gesundheitspolizei*) employed by the state whereas in the western provinces of Prussia and in the other states the duties mentioned above were the responsibility of the city.

It was Frankfurt am Main which first established, in 1883, the post of Municipal Officer of Health, an officer who was in charge of the public health services and of collecting of statistics concerning health care as well as acting as an advisor. Indeed, the range of tasks of the Stuttgart medical officer consisted mainly of acting as a technical advisor to the city authorities on issues related to public health service.

The possibility, allowed under the Prussian District Medical Officer Act, of combining state and municipal posts encouraged some towns and cities to transform district medical officers into Municipal Officers of Health. In these cases the District

10. Dawson 1914, p. 191.

11. Medizinalrat Dr Flinzer in Plauen, *Die Gesundheitspolizei in den deutschen Städten*, in: Robert Wuttke (ed.) *Die deutschen Städte*, Dresden 1904, pp. 461—463.

Medical Officer was entrusted also with the confidential tasks of a Municipal Officer of Health, such as giving expert opinions on the state of health of prospective municipal employees at the time of job interviews or pension applications. This procedure was adopted by some textile cities (Barmen, Crefeld and Elberfeld), by some metal cities (Duisburg, Essen) as well as by Hildesheim, Magdeburg, Mühlheim, Mönchengladbach and Strasbourg. On the other hand some of the cities, such as Altona, Dortmund, Düsseldorf and Osnabrück, employed only those who had qualified by examination as District Medical Officers as Municipal Officers of Health in which cases the cities were able to give them the District Medical Officer's duties too. In some cities (Frankfurt am Main, Breslau and Halle) the Municipal Officers of Health were closely subordinated to the city administration and became high-ranking municipal officials.

The state of Saxony differed from other parts of the Empire because there the state health care authorities were in the main in charge of the municipal health care provision for the cities also. — An improved state of public health services was displayed in the model, adopted by Cologne, Berlin-Schöneberg and Charlottenburg, of establishing special Municipal Medical Councils.¹²

In Britain the Public Health Care Act was passed by Parliament in 1872 and consequently the whole of England was mapped out in Sanitary Districts. The activities of the British Medical Officers and the Sanitary Inspectors attracted the attention of foreign observers in the same way as the work of the Surveyors and Clerks of the Councils.

The larger towns were the first to appoint full time officials. At the beginning of the 19th century the responsibility of the state of health care had already fallen on the Poor Law Medical Officers who were obliged to report to the Boards of Guardians. They insisted on improvements for example in the cleansing of streets, court yards and some other open spaces as well as in sewerage systems. Already in a circular, sent in 1846 to Guardians the Poor Law Commissioners had suggested

12. A. Gottstein, Stadtärzte, in: Handwörterbuch der Kommunalwissenschaften Bd. IV, Jena 1924, pp. 17—21. A. Gottstein was Sanitätsrat, a Doctor of Medicine of Charlottenburg.

"The improvement of the sanitary conditions of the poorer classes tends so greatly to remove many of the causes of destitution and pauperism, that money judiciously expended on such an object now sanctioned by the legislature . . . will be found to be the most profitably laid out even in reference to the more direct object of their duties as Guardians."¹³

Thus for example Liverpool got its first full-time Medical Officer of Health, Dr. Duncan, in 1847. Manchester, however, did not appoint such an Officer until 1868 and Birmingham only in 1875.¹⁴ Another group of officials, the Sanitary Inspectors, also played a prominent part in the dissemination of information and organizing of public campaigns for the promotion of private and public hygiene. So for example at the sanitary congress at Liverpool in 1894 in the section on Sanitary Science and Preventive Medicine a paper was read by Sir Douglas Dalton on *The teaching of hygiene in elementary schools* in which he suggested that schools should introduce children to some forms of applied cleanliness and by adding baths to every elementary school they should try to force children into a habit of washing at least once a week.¹⁵ In the early years of the 20th century cities also began to establish, more frequently than before, posts for Health Visitors. The task of these officials was to go round inspecting housing and hygienic conditions and particularly significant was their contribution to the supervising of child care in their areas.

"The work of the Health visitor is designed to cover a large field left untouched by the Sanitary Inspector, or any other agency, and one which is essential to the permanent improvement of the health of community in connection with domestic conditions of cleanliness, wise feeding, cooking and

13. Ruth Hodgkinson, *The Origins of the National Health Service*, London 1967, pp. 648—649; "Circular 8. Oct. 1848" quoted in Hodgkinson 1967, p. 647.

14. Waller 1983, p. 283.

15. *Progress in Public Health*, London 11.10.1894, p. 654.

clothing, the intelligent rearing of children, and general household management and methods.¹⁶

The health care acts, passed in Sweden in 1874 and in Finland in 1879, were very similar in their content to those in Germany and Britain. The Municipal Boards of Health were to submit an annual report to the City Council on the state of health in the town. The Municipal Officer of Health was an ex officio member of this board. Special attention had to be paid to those industrial undertakings posing possible risks to public health as well as to infectious diseases. The main responsibility for these activities was borne by municipal medical officers in the cities and District Medical Officers in the country side. The duties of the Municipal Health Commissioners was to carry out sanitary inspections and investigations in private dwellings, industrial plants and business premises.¹⁷

In Helsinki the over-all control of health care matters was entrusted after 1878 to the Municipal Officer of Health who at the same time acted as the chairman of the Municipal Board of Health. In the 1880's, at the time of the most hectic period of growth in Helsinki, several special regulations were issued, (following the models provided by European large cities), which controlled the trade in foodstuffs and matters relating to cleansing and sanitation. Already by 1884 a system of Health Police had been established, which in the beginning employed two inspectors. The years 1904—1905 saw the establishment of several other inspectors' posts, such as Inspectors of Handicraft, Smoke, Hotels, Restaurants and Housing, all of whom had to be university graduates. In 1893 the second post of Municipal Officer of Health was created in Helsinki, and the holder had to carry out inspections of forensic medicine and give medical certificates. The administrative and health care

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16. Eleanor Greg, Health visitors. Work at Manchester, *The Municipal Journal* 10.9.1909, pp. 762—763; Health visitors, London order, quoted in the *Municipal Journal* 10.9.1909, p. 763.
 17. Palmberg 1895, pp. 439—442, 479—484, 492—510; Bertel von Bonsdorff, *The history of medicine in Finland 1828—1918*, Societas Scientiarum Fennica, Helsinki 1975; Hans Kejserliga Majestäts Nådiga Förordning angående helsowården i Finland, gifwen i Helsingfors, den 22. December 1879, *Finlands författningssamling* 1879.

tasks remained the duties of the First Municipal Officer of Health.

Like many German cities and towns, Helsinki was also a working place for two regional or District Health Officers, who worked with the poorest part of the population.¹⁸ Because of its maritime location, and because industrialization there was not so advanced, Helsinki was in a more advantageous position than for example many large German cities and did not suffer from major smoke problems. Following European models a post of Smoke Inspector was, nevertheless, established also in Helsinki.

Health Care Acts passed in various European countries also had another important effect. They contributed to the more efficient compilation of statistics on infectious diseases and causes of death. Thus for example a statement of the sanitary conditions of Helsinki was given in the weekly Bulletin in Brussels. Statistics of morbidity were observed between groups differing according to occupation, age, nationality and religious background. Other aspects of the medical statistics were concerned with the birth rate, mortality and various other sort of illnesses among different population groups. As a result medical statistics developed into an independent discipline alongside demography.¹⁹

Due to this new discipline we have comparative information on the state of health, and the morbidity and death rates in different areas, which reveal the effects of environment on human health, partly caused by industrialization. The nuisances of smoke, noise and dust were not thought, however, to tell against the attraction of industry.²⁰

Major epidemics of infectious diseases gave extra work also to the health authorities in Helsinki. In 1831, cholera epidemics transmitted by the Russian troops stationed there, spread to the city killing 293 persons. They reappeared in 1849, 1853 and

18. Åström 1956, pp. 184—187; Vilhelm von Sucksdorff, Städernas särskildt Helsingfors hälsovårdshållande i jämförelse med landsbygdens, Tidskrift för hälsovård 1909, p. 31.

19. Friedrich Prinzing, Handbuch der medizinischen Statistik. Zweite vollständig umgearbeitete Auflage, Erste Halbband, Jena 1930 (1. Auflage 1906), p. 1—4.

20. Prof. O. Schwarz, Die Heranziehung von Industrien, Städte-Zeitung, 25.3.1904, pp. 335—336.

1854 through sea-borne travellers from St. Petersburg and again in 1871 and 1893 leading to the establishment of a special cholera hospital. Typhoid also provided ordeals for the city until the 1890's. In addition it was difficult to combat epidemics of measles and scarlet fever. Due to the efficient statistics it is possible to discover that for example in 1891 the number of deaths due to measles totalled 145, but in 1897—98 it fell to 93 and in 1907 to only 20 people. Scarlet fever was contracted in Helsinki by 20 to 30 per cent of all children under 10 years of age in 1911—1914. At the end of the century there were also serious influenza and fever epidemics. In 1892 there was even smallpox epidemic, spreading from the barracks of the Russian troops, which threatened the city, but it was contained by the practice of vaccination, which had been made compulsory in 1883 due to the urgency caused by previous epidemics.²¹

The creation of health insurance was also thought to affect morbidity rates, for a person was more inclined to notify himself as being ill if he could expect to get half a day's salary.²²

The more efficient collecting of statistics made it possible to compare birth rate and death rate figures also at the international level in relation to certain areas and certain periods of time. A good example of the comparison at various levels is given in the following article published in the *Municipal Journal*:

"Of the big cities of this country London still holds a place among the healthiest. Its death rate is lower than that of Manchester, Liverpool, Birmingham, Leeds or Sheffield not to mention a long list of other towns with fewer people inhabiting them... But if London can score off its sister cities, it is left behind by the cities of other countries. Time was when London was by far the healthiest city in Europe. Year after year its death rate fell very much below that of any other Continental capital... Ten years

21. Paavo Heiniö, Kunnallisen sairaanhoitotoimen synty. Kuumelasaretti eli kunnan julkinen sairaala, kunnallissairaala, kolerasairaala, in: Paavo Heiniö (ed.), Helsingin kaupungin sairaalalaitoksen historia, Helsingin kaupungin julkaisuja N:o 19, Helsinki 1968, pp. 18—19.

22. Prinzing 1930, p. 223.

ago London's death rate was 19.9. Now for 1897 that is 18.2. Here in a period of ten years we have only reduced our mortality bill by one in the thousand, but Rome which ten years ago had a death rate of 22.6, has pulled it down to 16.9; and Berlin has reduced its rate from 20.4, to 17.7. Amsterdam has the lowest record of any, having ten years ago had a death rate of 20.4, today it is only 15.8. Ten years ago Stockholm had the same death rate as London but instead of reducing it by one, as we have done it, it has reduced it by three until today the figures stand at 16.7. Brussels has come down from 20.2 to 16.6, and Copenhagen from 20.5 to 17.5. *The truth is that they have given more attention to sanitary science.* Germany for instance is far ahead of England in its zeal for public health. Even in cities which have not yet fallen below the London rate, a larger proportionate decrease is shown. Paris for example with a death rate of 22.0 ten years ago has now a rate of 18.6 and in Vienna the corresponding figures are 23.9 and 20.9. New York has reduced its rate by five, from 24.2 to 19.4. Surely here is matter for the consideration of the next Public Health Congress."²³

Some years later Germans made similar comparisons based on their statistical activities concerning health care and discovered that in this respect they were well behind not only the British but also the Scandinavians²⁴ who had already begun the systematic collection of statistics in some demographic areas during the 18th century. Not only do the Swedish Statistics of 1749 (Tabellverket) contain information on births and deaths but also data on various causes of death classified according to the age of the deceased. The statistics, based on systematic tabulatory data collection remained almost unaltered during the 19th century both in Sweden and Finland, even though Finland had become, in 1809, an autonomous state

23. Health in London compared with Provincial Cities and Continental Capitals, *The Municipal Journal* and London 5.1.1899, p. 19.

24. Die deutsche Städtestatistik auf der Internationalen Hygiene-Ausstellung zu Dresden, *Städte-Zeitung* 4.4.1911, pp. 409—410.

annexed to the Russian Empire. A hundred years later, after 1857, the District Medical Officers had begun to present in their reports systematic information on the standard of health among the population. The long tradition of the use of statistics facilitated in the Nordic countries the acceptance of new obligations for collection of statistical material.²⁵

Quantitative measurements of health care services as improvers of the state of health

In his article *Gesundheitspflege* published in 1922 A. Gottstein aptly describes the trends affecting the development of public health services in Germany and divides them to four main categories.

1. Given the spread of cholera from Asia to Europe in the 1830's and the greater incidence of abdominal typhoid fever assumptions were made about the interrelationship of uncleanness of cities and the incidence of epidemics. Following British models German towns and cities began to pay attention to the defects of medieval town planning and to the supplies of pure drinking water. All this resulted in the establishment of the water supply and sewerage systems and of slaughterhouses as well as in the control of market trade.

2. The research work by Lester and Pasteur into wound healing was of decisive importance in the establishment of modern nursing. The aim was also to isolate by other measures those who had contracted infectious diseases and hospitals were developed into proper nursing institutions.

3. The public health services as a whole were much influenced also by the notion of social insurance which

25. Edvard Arosenius, The History and Organization of Swedish Official Statistics, in: John Koren (ed.), The History of Statistics, Their Development and Progress in Many Countries, New York 1970, pp. 537—538; Medicinalstyrelsen, Årsberättelser av Provincialläkaredistricter 1857—National Archives of Finland.

originated in the activities of labour movement. After enacting social welfare legislation, attempts could be made, on the basis of positive experience, to extend social welfare laws to cover also women and children. Financial backing for this plan had to be found in municipalities, for private associations were not able to meet the high costs incurred.

4. A target, set increasingly frequently, was to maintain and improve the health of the entire population. This was achieved first of all by enacting ordinances for the obligatory notification of cases of infectious diseases, for the maintenance of public hygiene in cities and for food laws. Secondly also regulations on urban construction were enacted for this purpose. The third measure, the general teaching of hygiene also aimed at the same target. In Germany the hospitals maintained by charitable organizations or religious communities developed into public hospitals maintained by the cities. The cities also assumed responsibility for the care of the disabled and transport of the sick as well as for disinfection institutes and the whole of the infrastructure.²⁶

At the end of the 19th and the beginning of the 20th century the point was reached, where attempts could be made to measure the 'progressiveness' of the cities in the launching of measures for the improvement of health (for example the infant care and school health care systems). These matters will be dealt with later in this study.

Recently some claims have been made that the quantitative development of various service areas of public health care did not have the direct influence on health conditions that was previously assumed and similar doubts have also been expressed concerning the effects of the development of medicine and, for example, of drugs. Indeed, it is now asserted that it was the development of general social hygiene that had the most decisive influence. Therefore the development of the whole infrastructure is now considered to be one of the most important explanations of improved levels of health. This improved infrastructure was partly due to the important

26. A. Gottstein, Gesundheitspflege, in: Handwörterbuch der Kommunalwissenschaften, Bd. II, Jena 1922, pp. 362—373.

invention of a filter which directly affected the quality of drinking water.²⁷

The improvements in the sewerage system, the cleansing of streets, and disposal of refuse affected the situation in a similar way.

Besides this improvement of the infrastructure the raising of living standards has also been suggested as an explanation for the general improvement of health. Here again the interest of researchers is focussed on the differences between various social groups, occupations and localities.²⁸

On the basis of what has just been said it is possible to present two alternative hypotheses:

- that the better health care services improved the standard of health,
- that the better standard of health was not due to the improved health care services but to a rise in the standard of living and the level of hygiene and in connection with that to the development of infrastructural services.

It is, however, very difficult to verify either of these hypotheses. In addition one has to take into account the effect of the widely used natural healing methods and lay healers which is not evident in the statistics even if their actual impact was greater than has been assumed previously.²⁹

Infant mortality is a very good indicator of the standard of living in cities. The correlation between the level of income in 16 cities of the United Kingdom³⁰ and the infant mortality rate

27. For example Reinhard Spree, *Zur Bedeutung des Gesundheitswesens für die Entwicklung der Lebenschancen der deutschen Bevölkerung zwischen 1870 und 1913*, in: H. Blaich (ed.), *Staatliche Umverteilungspolitik in Historischer Perspektive*, Schriften des Vereins für Sozialpolitik, Berlin 1980, pp. 171—228.

28. Reinhard Spree, *Strukturierte soziale Ungleichheit im Reproduktionsbereich. Zur historischen Analyse ihrer Erscheinungsformen in Deutschland 1870 bis 1913*, in: Jürgen Bergmann, Klaus Megerle and Peter Steinbach (eds.), *Geschichte als politische Wissenschaft. Sozialökonomische Ansätze, Analyse, politikhistorischer Phänomene, politologische Fragestellungen in der Geschichte*, Stuttgart 1979, pp. 73—94.

29. Cf. Spree 1980.

30. Rates of wages (in building, engineering and printing). Figures showing comparison with London: London 100, Birmingham 93, Liverpool 92, Manchester 90, Sheffield 90, Leeds 91, Bristol 87, Newcastle 90, Cardiff 89, Swansea 87, Glasgow 88, Edinburgh 86, Dundee 85, Aberdeen 81, Belfast

in 1912, when calculated on the basis of the *Comparative Municipal Statistics* in the same cities is .64 and it suggests that high income levels are associated with low infant mortality (see Appendix X). The lowest infant mortality in the United Kingdom seems to occur in cities with medical schools.

In large cities the incidence of infant mortality varied from one part of the city to another. In London, according to research by Charles Booth, it varied from 17 per cent to 24.7 per cent.³¹ The average infant mortality in the cities in the United Kingdom was lower than that in German cities. Notably the rates in London (130 in 1911 and 91 in 1912) are lower than the rates in Berlin (173 in 1911 and 142 in 1912, see Appendixes X and XI). — It is worth mentioning also that in Stockholm the infant mortality in 1911/12 was 82 and in Helsinki 130. The exceptionally high figure was due to the scarlet fever epidemic prevailing in Helsinki at that time.³²

Table 33. illustrates infant mortality both in Germany and in the United Kingdom in 1911 and 1912. Due to the exceptionally hot summer the infant mortality was very high in both countries in 1911.³³

The following tables illustrate the differences between various groups of German cities.

Table 34. clearly indicates that infant mortality in 1910 was slightly higher in the regional centres and in the metal industry cities. The differences are not statistically significant. This means that the occupational structure of the city was not valid for the explanation of infant mortality.

80 and Dublin 78; Cost of Living of the Working Classes, Report of an Enquiry by the Board of Trade into Working Class. Rents and Retail Prices together with the Rates of wages in certain occupations in industrial towns of the UK in 1912 (presented to both Houses of Parliament 1913).

31. Charles Booth, *Life and Labour of the People in London*, Vol 9, Comparisons, Survey and Conclusions, London 1897.

32. A. Tunkelo, *Imeväiskuoletisuus Suomessa kahden vuosisadan aikana. Taustolaitos-Tabellverket 1748—1948*, Helsinki 1948, p. 25; A. Ruotsalainen, *Vuotta nuorempien lasten kuolleisuus Helsingissä 1911—1924*, Duodecim 1925, pp. 591—.

33. Heinrich Silbergleit, *Bevölkerungswechsel im Jahre 1911*, Stat. Jb. Deutscher Städte, Jg. 20, p. 45.

Table 33.

Infant mortality (deaths under one year off age per 1,000 births) in some cities of Germany and United Kingdom in 1911 and 1912.

1911¹

United Kingdom			Germany				
Lowest		Highest	Lowest		Highest		
Edinburgh	114	Birmingham	172	Barmen	112	Chemnitz	284
Belfast	128	Dublin	165	Wiesbaden	119	Augsburg	242
London	130	Leeds	159	Mainz	134	Stettin	243
		Dundee	157	Bremen	135	Metz	243
		Manchester	156			Leipzig	242
		Liverpool	155			Aachen	241

1912

London	91	Dundee	161	Cassel	94	Frankfurt an	
Swansea	101	Dublin	147	Wiesbaden	95	der Oder	190
Newcastle	102	Belfast	129	Elberfeld	99	Posen	182
Leeds	103	Aberdeen	127	Barmen	101	Augsburg	178
Bristol	103			Kiel	109	Chemnitz	171

1 Due to an exceptionally hot summer in 1911 the infant mortality was very high.

Sources: Comparative Municipal Statistics, Vol. 1, Table 13, pp. 18—19 and Statistisches Jahrbuch Deutscher Städte, Jg. 20, pp. 70—71; Jg. 21, pp. 76—77.

On the contrary, it seems that the regional factor is the most important. Table 35. indicates that infant mortality was very high in the cities which were located in the eastern part of Germany (infant mortality 291 in 1900 and 186 in 1910). Infant mortality was clearly lower in the cities of the Ruhr Area and in the North-Western cities.

This result is very clear also on the basis of *step-wise regression analysis*. Infant mortality in 1910 was the dependent variable (see Appendix IX, model 5).

It was discovered that infant mortality was high in the geographically most eastern German cities, and rather high in

Table 34.
Infant mortality in German cities according to the applied classification in 1890, 1900 and 1910.

	Commer- cial Cities	Adminis- trative Cities	Metal Industry Cities	Textile Industry Cities	Garrison Cities	Regional Centres	On Average	Tail prob- ability	(N)
Infant	1890	201	215	240	220	198	241	221	0.469 (44)
mortality	1900	205	232	232	233	203	257	230	0.424 (44)
	1910	143	146	164	136	151	167	151	0.329 (44)

Source: Calculated on the basis of Statistisches Jahrbuch Deutscher Städte, Jg. 2, pp. 30, 36; Jg. 10, pp. 101—103; Jg. 19, pp. 67—68.

Applied classification:

Commercial Cities: Altona, Bremen, Cologne, Frankfurt a.M., Hamburg, Leipzig, Lübeck

Administrative Cities: Berlin, Brunswick, Breslau, Cassel, Dresden, Hanover, Karlsruhe, Königsberg, Magdeburg,

Munich, Strasbourg, Stuttgart

Metal Industry and Mining Cities: Chemnitz, Dortmund, Düsseldorf, Essen, Mannheim, Nuremberg

Textile Industry Cities: Aachen, Augsburg, Barmen, Crefeld, Elberfeld, Mulhouse

Garrison Cities: Kiel, Mainz, Metz, Potsdam

Regional Centres: Danzig, Erfurt, Frankfurt a.O., Görlitz, Halle, Posen, Stettin, Wiesbaden, Würzburg

Table 35.

Infant mortality in German cities grouped according to geographical location in 1890, 1900 and 1910.

	In the Ruhr area			In Southern and Western Germany	In North-Western Germany	In Central Germany	In Eastern Germany	On Average	Tail probability	(N)
Infant mortality	1890	211	210	182	197	230	285	221	0.0003	(44)
	1900	202	221	197	252	291	291	230	0.0004	(44)
	1910	132	156	133	151	186	186	151	0.0006	(44)

Sources: Calculated on the basis of Statistisches Jahrbuch Deutscher Städte, Jg. 2, pp. 30, 36; Jg. 10, pp. 101—103, Jg. 19, pp. 67—68.

Location of the city:

In the Ruhr area: Aachen, Barmen, Cologne, Crefeld, Dortmund, Düsseldorf, Elberfeld, Essen

In Southern and South-Western Germany: Augsburg, Frankfurt a.M., Karlsruhe, Mainz, Mannheim, Metz, Mulhouse, Munich, Nuremberg, Strasbourg, Stuttgart, Wiesbaden, Würzburg

In North-Western Germany: Altona, Brunswick, Bremen, Cassel, Hamburg, Hanover, Kiel, Lübeck

In Central Germany: Berlin, Chemnitz, Dresden, Erfurt, Halle, Leipzig, Magdeburg, Potsdam

In Eastern Germany: Breslau, Danzig, Frankfurt a.O., Görlitz, Königsberg, Posen, Stettin

cities of Southern and South-Western Germany, and cities with a high proportion of people working in the metal industry with the exception of those cities in the Ruhr where infant mortality was low. The above-mentioned three variables explain 45 % of the variance of infant mortality ($R^2 = .45$) in 1910 which can be regarded as a normal year as opposed to 1911.

Death rates in the cities concerned varied also from country to country. In the United Kingdom it differed from 23.5 per thousand inhabitants in Dublin to 18.8 in Dundee, 18.5 in Liverpool, 13.8 in London and 13.6 in Swansea and Bristol. The general rate of mortality in Germany fell steadily from 20.8 in 1905 to 17.1 in 1910.³⁴

An attempt is made in what follows to investigate the development of the volume of the health care services in the various types of German cities. Some information on the personnel and the institutions is selected to illustrate the equipment available in the field of health care.

For the *preliminary study* a number of variables were selected which were related to the numbers of the health care personnel as well as to hospitals and pharmacies in 1887, 1898 and 1909.³⁵

- authorized doctors (civil doctors with a private surgery, groups of military doctors running civil surgeries, groups of surgeons, doctors working in hospitals and other institutions)
- dentists
- authorized veterinary surgeons
- "health servants", ancillary personnel, bath house attendants (qualified and non-qualified in 1909) as well as

34. Sanitätsrat Dr. med. F. Prinzing, Sterblichkeitsstatistik (internationale), in: A. Grotjahn and J. Kaup (eds.), Handwörterbuch der sozialen Hygiene Bd. II, Leipzig 1912, p. 537.

35. Die Verbreitung des Heilpersonals und der Apotheken am 1. April 1887, Stat. Jb. Deutscher Städte, Jg. 1, p. 182; Das Heilpersonal und die Apotheken im Jahre 1889 bezw. 1889/1890, Stat. Jb. Deutscher Städte, Jg. 2, p. 285; Approbierte Ärzte und Tierärzte am 1. Mai 1909, Approbierte Zahnärzte und Zahntechniker am 1. Mai 1909, Krankenpfleger, Hebammen am 1. Mai 1909, Berufsmäßige Heildiener einschl. Masseure und Desinfektoren am 1. Mai 1909, Die pharmaseutischen Anstalten und deren Personal am 1. Mai 1909, Stat. Jb. Deutscher Städte, Jg. 19, pp. 98—106.

- persons working in institutions or outside institutions, such as masseurs and innoculators
- qualified nurses, both men and women
- midwives
- pharmacies including branches
- pharmaceutical personnel including owners, apprentices and assistants

The statistical material on public hospitals in the *Statistisches Jahrbuch Deutscher Städte* in 1890 is analyzed in connection with poor relief, which illustrates the secondary status of these health care services. In 1900 hospitals already form their own group.³⁶

So far as the health services in Great Britain are concerned information comparable with that from Germany is available both about those hospitals under and those not under public management for the year 1912.³⁷ In addition statistical information is available for the largest towns and cities in the United Kingdom concerning various classes of hospitals (general, women's and children's, lying-in, consumption, ophthalmic and other special hospitals).

However, the relevant division in this study is between the hospitals under public management and those not under public management. The most useful variable is the number of beds per 1,000 inhabitants.³⁸

The *preliminary research* demonstrated that in 1887—1909 the greatest expansion had been in the following health care services in relation to the size of population in Germany (see Table 36.):

- "health servants" (Heildiener) authorized by the state, assistant nurses and bath house attendants; the percentage increase between 1887—1909 was 151.1 per cent

36. Allgemeine (öffentliche und private) Heilanstalten im Jahre 1889 bzw. 1889/90, Stat. Jb. Deutscher Städte Jg. 2, pp. 281, 283; Die allgemeinen (öffentlichen und privaten) Heilanstalten im Jahre 1900 oder 1900/01, Stat. Jb. Deutscher Städte, Jg. 12, pp. 338—343, 345—346.

37. Statistics of hospitals, general, special and infectious, 1912, Comparative Municipal Statistics 1912—13, Vol. I., pp. 34—35.

38. Information on comparative statistics is supplied by each city, supplemented with information from Burdett's Hospitals and Charities, Comparative Municipal Statistics 1912—13, Vol. I., pp. 34—35.

Table 36.

Some health care services per 100,000 inhabitants in 44 German cities of various sizes in the years 1887, 1898 and 1909.

Variable	Number of inhabitants	50,000- 100,000	N	100,001- 200,000	N	200,001- 1 000,000	N	Berlin	Mean of the Cities	N	Whole realm per 100,000 inhabitants
Authorized doctors	1887 1898 1909	73.3 88.6 73.5	23 17 8	68.3 79.9 86.6	16 9 18	85.8 104.6 88.3	4 9 17	72.8 129.8 86.0	72.6 89.4 84.9	44 44 44	33.3 45.6 48.1
Difference Percentage increase	1887-1909	0.2 + 0.0	8	18.3 + 26.8	18	2.5 + 0.3	17	13.2 + 18.1	12.3 + 16.9	44	
Dentists	1887 1898 1909	4.7 8.5 9.5	23 17 8	4.9 6.1 10.9	16 17 18	5.2 9.0 10.3	4 9 17	5.4 12.0 14.2	4.8 7.8 10.5	44 44 44	1.2 2.4 4.2
Difference Percentage increase	1887-1909	4.8 + 102.1	8	6.0 + 122.4	18	5.1 + 98.1	17	8.8 + 163.0	5.7 + 118.7	44	
Veterinary Surgeons	1887 1898 1909	11.1 13.0 14.5	23 17 8	7.0 7.9 7.8	16 17 18	8.9 8.2 7.0	4 9 17	8.1 7.2 4.9	9.3 9.9 8.6	44 44 44	6.7 7.3 4.2
Difference Percentage increase	1887-1909	3.4 + 30.6	8	0.8 + 11.4	18	-1.9 - 21.3	17	- 3.2 - 39.5	0.7 - 7.5	44	
"Health servants"	1887 1898 1909	12.5 32.2 40.1	23 17 8	12.2 21.0 29.2	15 17 18	22.0 33.7 37.9	4 9 17	38.0 67.6 45.1	13.9 29.0 34.9	43 44 44	11.7 17.4 23.3
Difference Percentage increase	1887-1909	27.6 + 220.8	8	17.0 + 139.3	18	15.9 + 72.3	17	7.1 + 18.7	21.0 + 151.1	44	
Qualified nurses	1887 1898 1909	77.9 119.4 197.5	23 17 8	83.8 124.9 168.5	14 17 18	88.5 118.9 159.3	4 9 17	87.2 65.5 155.1	80.6 120.2 169.9	42 44 44	31.3 56.6 108.3
Difference Percentage increase	1887-1909	119.6 + 153.5	8	84.7 + 101.1	18	70.8 + 80.0	17	87.9 + 130.8	89.3 + 110.8	44	
Midwives	1887 1898 1909	50.8 50.6 33.3	23 17 8	51.2 44.8 37.0	16 17 18	46.6 43.8 35.6	4 9 17	55.2 47.0 32.8	50.7 47.0 35.7	44 44 44	76.9 70.8 59.0
Difference Percentage increase	1887-1909	- 17.5 - 34.4	8	- 14.2 - 27.7	18	- 11.0 - 23.6	17	- 22.4 - 40.6	- 15.0 - 29.6	44	
Pharmacies	1887 1898 1909	12.2 14.7 2.5	23 8 8	10.3 9.8 - 0.5	16 18 18	9.1 8.7 - 0.4	4 17 17	7.2 8.8 1.6	11.1 10.2 - 0.9	44 44 44	10.0 9.7 9.7
Difference Percentage increase	1887-1909	2.5 + 20.5	8	- 0.5 - 4.9	18	- 0.4 - 4.4	17	1.6 + 22.2	- 0.9 - 8.1	44	
Pharmaceutical Personnel	1887 1898 1909	42.2 38.5 - 3.7	23 8 8	39.8 30.0 - 9.8	16 18 18	41.3 30.9 - 10.4	4 17 17	29.1 30.9 - 9.1	41.0 31.9 - 9.1	44 44 44	22.6 21.0 21.0
Difference Percentage increase	1887-1909	- 8.8 - 8.8	8	- 24.6 - 24.6	18	- 25.2 - 25.2	17	6.2 + 6.2	- 22.2 - 22.2	44	

Sources: Calculated on the basis of Statistisches Jahrbuch Deutscher Städte, Jg. 1, pp. 182-183; Jg. 8, pp. 130-151; Jg. 19, pp. 92-106; Medizinisch-statistische Mitteilungen aus dem Kaiserlichen Gesundheitsamte, Beihefte zu den Veröffentlichungen des Kaiserlichen Gesundheitsamtes, Bd. 6, Bd. 15.

- dentists 118.7 per cent
- qualified nurses 110.8 per cent

On the other hand there was some increase during the period studied in the relative number of doctors (increase approximately 17 per cent). On the basis of the Table 36. it can be concluded that the increase in the number of doctors had not yet had time to adapt itself to the rapid growth of cities. In 1909 the mean of the 44 cities was 85 doctors/100,000 inhabitants when the ratio was in 1898 already 89 doctors/100,000 inhabitants. The increase of doctors was clear in cities with 100,000—200,000 inhabitants, whereas the relative number of doctors per inhabitant remained smallest at the end of the period in cities with 50,000—100,000 inhabitants. The relative number of midwives and veterinary surgeons had somewhat decreased, the former because of the development of the hospital network and the latter because of changes in the occupational structure.

When observing more closely the supply of health care services it is possible to see that in the larger cities there were relatively more doctors and dentists. Being mostly private services they were significantly associated with the size of the population.

Changes in the development of health care services took place due to institutional reasons. Considering the level of services it might not make any difference whether or not 'health servants' were authorized by the state, and this is reflected also in the statistics. In 1887 only the 'health servants' with state authority were acceptable but in 1909 the scope of this service group had expanded, for masseurs, innoculators, disinfectors etc. were also included in the same group.

The quality of training for qualified nurses was decisively influenced by a decision of the Bundesrath on March 22nd 1906 which obliged state health care institutions to undertake the training of nurses, which could last from six months to three years.³⁹

39. Das Deutsche Reich in gesundheitlicher und demographischer Beziehung, Festschrift den Teilnehmern am XIV. Internationalen Kongresse für Hygiene und Demographie in Berlin 1907, gewidmet vom Kaiserlichen Gesundheitsamte und vom Kaiserlichen Statistischen Amte, Berlin 1907.

The relative number of authorized doctors, the 'health servants' was smallest in 1887 and 1898 in cities with 100,000—200,000 inhabitants, although in other cases the improvement of these services was recognizably in line with the size of the city. This dependance on population increased by the year 1909. In the research covering 1887—1909 the increase of authorized doctors and dentists was very strong precisely in these cities with 100,000—200,000 inhabitants. It is also worth bearing in mind that during the research period the doctors' training was intensified and consequently the number of doctors increased from 7,420 in 1867 to 20,394 in 1913. The regional differences were, however great, for example in Prussia and similarly between various types of cities.⁴⁰

The most active cities were also efficient in promoting the further training of their medical practitioners. Thus for example in Cologne the City Council granted permission in 1903 for the establishment of the Akademie für praktische Medizin and a similar measure was taken by Düsseldorf in the following year, 1904. Both of these institutes differed from the further training courses for doctors arranged in other large German cities owing to their university nature and the standard of their teaching staff.⁴¹

The differences in the levels of services appear very distinctively as between industrialized cities and non-industrialized cities. The health care services did not adapt themselves to the fast growth of industrial cities. In most industrialized cities as in area of the Ruhr, for example, the number of doctors per inhabitant was only half what it is in the less industrialized cities (see Table 38. and Table 40.).

Regarding the health care services the greatest difference between cities, when classified according to population, lay in the number of authorized doctors, dentists and hospital beds and relatively these differences even increased to a certain extent between 1887 and 1909. Moreover, the differences between these types of cities in the categories of midwives, pharmacies and pharmaceutical personnel are almost negligible.

40. Matzerath 1985, pp. 341—342.

41. A. Gottstein, Gesundheitsfürsorge, ihre Zentralisation, in: Handwörterbuch der Kommunalwissenschaften, Band II, Jena 1922, pp. 357—360.

Therefore the following variables were selected for further analysis,

1. the number of authorized doctors per number of inhabitants
2. the number of dentists per number of inhabitants
3. the number of persons employed in the health care sectors according to data derived from censuses in 1895 and 1907 per number of inhabitants⁴²
4. the number of beds in general hospitals per number of inhabitants.

Doctors, dentists and health care personnel in various types of German cities

Various cities clearly differed from each other so far as the number of doctors was concerned in the cross-sectional years of this study. The Table 37. well demonstrates that the industrial cities clearly lagged behind the regional centres and the administrative cities. As to the *number of doctors* the situation was best in 1887 in the regional centres (89 doctors/100,000 inhabitants) and in the administrative cities (84 doctors/100,000 inhabitants). By 1909 the disparity with other cities had actually increased: the number of doctors in regional centres was then 106/100,000 inhabitants and in administrative cities 98/100,000 inhabitants while in metal cities 61/100,000 inhabitants and in textile cities it was only 58/100,000 inhabitants.

The same trend was obvious also in the case of *dentists*: in 1909 the administrative cities were in the best position having 13 dentists per 100,000 inhabitants and they were followed closely by regional centres and commercial cities (11 and 12 dentists/100,000 inhabitants). Also the garrison cities markedly differed from the industrial cities so far as the doctors' and dentists' services were concerned (see Table 37. and 39.).

42. Statistik des Deutschen Reichs, Neue Folge, Bd III, Bd. 107, Bd. 109, Bd. 209, Bd. 211.

Table 37.

Number of doctors per 100,000 inhabitants in German cities according to the applied classification in 1887, 1898 and 1909.

	Commer- cial Cities	Adminis- trative Cities	Metal industry Cities	Textile industry Cities	Garrison Cities	Regional Centres	On Average	Tail prob- ability	(N)
Number of	1887	70	84	50	46	81	89	72.6	0.003
doctors per	1898	84	108	69	57	77	109	89.4	0.001
100,000	1909	83	98	61	58	78	106	84.9	0.017
inhabitants									(44)

Sources: Calculated on the basis of Statistisches Jahrbuch Deutscher Städte, Jg. 1, p. 182; Jg. 8, pp. 150—151; Jg. 19, pp. 98—99; Medizinalstatistische Mitteilungen aus dem Kaiserlichen Gesundheitsamte (Beihefte zu den Veröffentlichungen des Kaiserlichen Gesundheitsamtes, Bd. 6; Bd. 15).

Applied classification:

Commercial Cities: Altona, Bremen, Cologne, Frankfurt a.M., Hamburg, Leipzig, Lübeck

Administrative Cities: Berlin, Brunswick, Breslau, Cassel, Dresden, Hanover, Karlsruhe, Königsberg, Magdeburg, Munich, Strasbourg, Stuttgart

Metal Industry and Mining Cities: Chemnitz, Dortmund, Düsseldorf, Essen, Mannheim, Nuremberg

Textile Industry Cities: Aachen, Augsburg, Barmen, Crefeld, Elberfeld, Mulhouse

Garrison Cities: Kiel, Mainz, Metz, Potsdam

Regional Centres: Danzig, Erfurt, Frankfurt a.O., Görlitz, Halle, Posen, Stettin, Wiesbaden, Würzburg

Table 39.
Number of dentists per 100,000 inhabitants in German cities according to the applied classification in 1887, 1898 and 1909.

	Commer- cial cities	Adminis- trative cities	Metal industry cities	Textile industry cities	Garrison cities	Regional centres	On average	Tail prob- ability	(N)
Number of	1887	6.0	6.0	3.6	2.3	4.5	4.8	0.06	(44)
dentists per	1898	8.7	9.9	5.7	3.0	7.6	7.8	0.002	(44)
100,000 inhab- itants	1909	11.6	13.3	6.9	7.3	8.6	10.5	0.0001	(44)

Sources: Calculated on the basis of Statistisches Jahrbuch Deutscher Städte, Jg. 1, p. 182; Jg. 8, p. 150; Jg. 19, p. 100.

Applied classification:

Commercial Cities: Altona, Bremen, Cologne, Frankfurt a.M., Hamburg, Leipzig, Lübeck

Administrative Cities: Berlin, Brunswick, Breslau, Cassel, Dresden, Hanover, Karlsruhe, Königsberg, Magdeburg, Munich, Strasbourg, Stuttgart

Metal Industry and Mining Cities: Chemnitz, Dortmund, Düsseldorf, Essen, Mannheim, Nuremberg

Textile Industry Cities: Aachen, Augsburg, Barmen, Crefeld, Elberfeld, Mulhouse

Garrison Cities: Kiel, Mainz, Metz, Potsdam

Regional Centres: Danzig, Erfurt, Frankfurt a.O., Görlitz, Halle, Posen, Stettin, Wiesbaden, Würzburg

According to the geographical grouping of cities the supply of dental services was remarkably smaller in the cities of the Ruhr area (see Table 41.).

So far as the medical services in individual cities were concerned the best situation was in Wiesbaden where the number of doctors was about five times that of Essen or Barmen and in the case of the health care personnel the respective figure was about four times (see Table 40.). An explanation for this excellent level of health care services can be found in the great number of spas in that city with a consequently large number of trained doctors and other nursing staff.⁴³ Wiesbaden was famous also for its innovative solutions for example in the field of school health care, the so-called 'Wiesbaden system'. This system aroused great interest also in the Nordic countries and encouraged many people to undertake special fact finding tours. One of its measures was to arrange for every school child a regular medical examination every other year.⁴⁴ — Also Munich and Frankfurt am Main, Halle, Würzburg, Strasbourg, Königsberg, Posen and Hanover were well placed when comparing the number of doctors in various cities (see Table 40.).

One explanation for the high level of doctoral services is the location of universities with faculties of medicine. Table 38. indicates that the number of doctors in 1909 is significantly greater in the cities located in the southern or south-western part of the country. Numerous medical faculties were located in this area (e.g. Munich, Freiburg, Heidelberg, Bonn, Würzburg, Marburg, Strasbourg, Giessen, Tübingen, Göttingen, Frankfurt a.M.). This has had undoubtedly an impact on the supply of doctoral services.

On the basis of Table 37. as well as the *step-wise regression analysis* (see Appendix IX model 6) it can be concluded that a good standard of medical services correlates with the occupational structure and the level of income in these cities.

The number of authorized doctors per 100,000 inhabitants in 1909 is explained on the basis of step-wise regression analysis.

43. L. Grote (ed.), Die deutsche Stadt im 19. Jahrhundert. Stadtplanung und Baugestaltung im industriellen Zeitalter, Munich 1974.

44. Max Oker-Blom, Kouluhygienia. Lääkäreitä ja koulumiehiä varten, Helsinki 1910, pp. 386—387.

Table 40.

The number of doctors, dentists and personnel employed in health care services per 100,000 inhabitants in 44 German cities grouped in ranking order.

Doctors/100,000 inhabitants in 1909		Dentists/100,000 inhabitants in 1909		Health care personnel (whole)/100,000 inhabitants in 1907	
Wiesbaden	240	Strassburg	19.5	Mulhouse	—
Munich	159	Wiesbaden	18.9	Mainz	—
Frankfurt a.M.	137	Hanover	16.3	Wiesbaden	1 097
Halle	119	Frankfurt a.M.	15.3	Würzburg	1 074
Würzburg	116	Karlsruhe	15.3	Strasbourg	957
Strasbourg	110	Cassel	14.5	Munich	760
Königsberg	104	Munich	14.3	Breslau	759
Posen	104	Berlin	14.2	Aachen	737
Hanover	101	Görlitz	14.0	Karlsruhe	725
Breslau	98	Breslau	14.0	Stuttgart	718
Görlitz	93	Posen	13.3	Metz	701
Stuttgart	92	Würzburg	13.2	Frankfurt a.M.	679
Karlsruhe	90	Leipzig	12.7	Halle	654
Cologne	89	Lübeck	12.2	Görlitz	635
Cassel	89	Altona	12.1	Königsberg	630
Dresden	89	Hamburg	11.7	Posen	627
Leipzig	88	Brunswick	11.3	Hamburg	622
Berlin	86	Dresden	11.3	Dresden	609
Danzig	83	Halle	11.2	Cologne	591
Mainz	83	Stettin	10.7	Potsdam	567
Brunswick	82	Mannheim	10.6	Berlin	561
Hamburg	82	Königsberg	10.6	Stettin	554
Potsdam	82	Kiel	10.3	Augsburg	536
Nuremberg	80	Stuttgart	10.1	Hanover	530
Kiel	78	Aachen	10.1	Cassel	529
Magdeburg	76	Potsdam	9.6	Kiel	510
Stettin	74	Augsburg	9.1	Frankfurt a.O.	503
Aachen	74	Mainz	8.9	Lübeck	495
Erfurt	72	Bremen	8.9	Bremen	488
Düsseldorf	69	Magdeburg	8.8	Danzig	485
Metz	68	Elberfeld	8.4	Brunswick	460
Bremen	67	Cologne	8.3	Altona	460
Augsburg	67	Dortmund	8.1	Leipzig	455
Mannheim	64	Frankfurt a.O.	7.6	Düsseldorf	445
Lübeck	63	Nuremberg	7.3	Magdeburg	416
Crefeld	57	Düsseldorf	6.7	Elberfeld	395
Elberfeld	56	Danzig	6.5	Mannheim	390
Dortmund	56	Erfurt	6.5	Dortmund	344
Altona	53	Metz	5.6	Erfurt	340
Chemnitz	52	Crefeld	5.5	Nuremberg	323
Frankfurt a.O.	52	Barmen	5.4	Crefeld	319
Barmen	48	Mulhouse	5.1	Chemnitz	314
Mulhouse	48	Essen	4.6	Barmen	295
Essen	44	Chemnitz	4.1	Essen	244

Sources: Statistisches Jahrbuch Deutscher Städte, Jg. 19, pp. 98—100; as to the health care personnel: Statistik des Deutschen Reiches, Bd. 209, Bd. 211.

Table 41.
Number of dentists per 100,000 inhabitants in German cities grouped according to geographical location in 1887, 1898 and 1909.

	In the Ruhr area	In Southern and South-Western Germany	In North-Western Germany	In Central Germany	In Eastern Germany	On Average	Tail probability	(N)
Number of dentists	1887 2.8	5.0	7.9	4.2	4.2	4.8	0.0001	(44)
	1898 4.4	8.2	10.4	7.3	8.2	7.8	0.014	(44)
per 100,000 inhabitants	1909 7.1	11.8	12.2	9.8	11.0	10.5	0.017	(44)

Sources: Calculated on the basis of Statistisches Jahrbuch Deutscher Städte, Jg. 1, p. 182; Jg. 8, p. 150; Jg. 19, p. 100.

Location of the city:

In the Ruhr area: Aachen, Barmen, Cologne, Crefeld, Dortmund, Düsseldorf, Elberfeld, Essen
In Southern and South-Western Germany: Augsburg, Frankfurt a.M., Karlsruhe, Mainz, Mannheim, Metz, Mulhouse,
Munich, Nuremberg, Strasbourg, Stuttgart, Hanover, Kiel, Lübeck

In North-Western Germany: Altona, Brunswick, Bremen, Cassel, Hamburg, Magdeburg, Potsdam

In Central Germany: Berlin, Chemnitz, Dresden, Erfurt, Halle, Leipzig, Königsberg, Posen, Stettin

In Eastern Germany: Breslau, Danzig, Frankfurt a.O., Görlitz, Königsberg, Posen, Stettin

The best combination of independent variables was the model where a large proportion of the population consisted of people with private means, pensions or income from rented property as well as civil servants and people in liberal professions and third the city's location in Southern or South-Western Germany; $R^2 = .55$.

Good dental care services were also clearly linked to a high proportion of civil servants and people in liberal professions.

As a private service dentistry in 1909 was also clearly linked with large cities where there was a great potential demand. This came out on the basis of the step-wise regression analysis; $R^2 = .57$ (see Appendix IX, model 7).

The combination of these variables illustrate the potential demand for dentistry services. Reasons for this are the high level of income and the position of the city in the upper level of central hierarchy or demand for services from a larger area.

The third indicator, the number of persons employed in health care services/100,000 inhabitants was highest in 1907 in regional centres the average being 663 persons/100,000 inhabitants. Next came the administrative cities (638/100,000 inhabitants) and smallest were metal cities (343/100,000 inhabitants) (see Table 42.).

Assessing the situation from the geographical aspect, Table 43. shows that a high proportion of persons in health care services is to be found in cities located in Southern and South-western Germany. The proportion is remarkably smaller in the cities of the Ruhr area. The explanation for this distribution can be found in the training sector.

As to the third indicator the high standard of regional centres can be explained by the great number of hospital beds in general hospitals per number of inhabitants⁴⁵ and in the small regional centres this figure was particularly high, because these centres often provided services for quite large areas of the surrounding country.

45. Öffentliche Krankenanstalten includes staatliche, städtische und private Krankenanstalten as well as hospitals of private foundations.

Table 42.

Number of persons employed in health care (doctors, nurses etc.)/100,000 inhabitants in German cities according to the applied classification in 1895 and 1907.

	Commer- cial Cities	Adminis- trative Cities	Metal Industry Cities	Textile Industry Cities	Garrison Cities	Regional Centres	On Average	Tail prob- ability	(N) ¹
People working in health care	1895 467	438	282	337	461	504	423	0.027	(44)
(doctors, nurses etc.)/1000 inhab.	1907 542	638	343	456	585	663	560	0.006	(43)

Sources: Calculated on the basis of Statistik des Deutschen Reichs, Neue Folge, Band 107. Berufs- und Gewerbebezahlung vom 14. Juni 1895. Berufsstatistik der deutschen Großstädte. Erster Theil, bearbeitet im Kaiserlichen Statistischen Amt, Berlin 1897; Statistik des Deutschen Reichs, Neue Folge, Band 109. Berufs- und Gewerbebezahlung vom 14. Juni 1895. Berufsstatistik der kleineren Verwaltungsbezirke, bearbeitet im Kaiserlichen Statistischen Amt, Berlin 1897. Statistisches Jahrbuch Deutscher Städte, Jg. 6, p. 352; Beiträge zur Statistik des Großherzogtums Hessen, Bd. 48, pp. 237—381; Beiträge zur Statistik des Großherzogtums Baden, Neue Folge, H. 9. Die Berufsbezahlung vom 14. Juni 1895, Karlsruhe 1895, pp. 246—257. Statistik des Deutschen Reichs, Neue Folge, Band 207, Abteilung VI. Großstädte, Berufs- und Betriebsbezahlung vom 12. Juni 1907; Statistik des Deutschen Reichs, Neue Folge, Band 209, Berufs- und Gewerbebezahlung vom 12. Juni 1907. Berufsstatistik. Abteilung VIII. Kleinere Verwaltungsbezirke, bearbeitet im Kaiserlichen Statistischen Amt, Berlin 1910; Statistik des Deutschen Reichs, Neue Folge, Band 211, Berufsstatistische Abteilung X. Die berufliche und soziale Gliederung des deutschen Volkes, Berlin 1913; Beiträge zur Statistik des Großherzogtums Hessen, Band 60, Heft 1, Darmstadt 1910.

Applied classification:

Commercial Cities: Altona, Bremen, Cologne, Crefeld, Frankfurt a.M., Hamburg, Leipzig, Lübeck

Administrative Cities: Berlin, Brunswick, Breslau, Cassel, Dresden, Hanover, Karlsruhe, Königsberg, Magdeburg, Munich, Strasbourg, Stuttgart

Metal Industry and Mining Cities: Chemnitz, Dortmund, Düsseldorf, Essen, Mannheim, Nuremberg

Textile Industry Cities: Aachen, Augsburg, Barmen, Crefeld, Elberfeld, Mulhouse

Garrison Cities: Kiel, Mainz, Metz, Potsdam

Regional Centres: Danzig, Erfurt, Frankfurt a.O., Görlitz, Halle, Posen, Stettin, Wiesbaden, Würzburg

¹ Missing: 1907 Mulhouse

Table 43.

Number of persons employed in health care (doctors, nurses etc.)/100,000 inhabitants in German cities grouped according to geographical location in 1895 and 1907.

	In the Ruhr area	In Southern and Western Germany	In North-Western Germany	In Central Germany	In Eastern Germany	On Average	Tail probability	(N) ¹
People working in health care (doctors, nurses etc.)/100 000 inhab.	1895 328 1907 421	519 710	407 512	384 489	417 599	423 560	0.020 0.002	(44) (43)

Sources: Calculated on the basis of Statistik des Deutschen Reichs, Neue Folge, Band 107, Berufs- und Gewerbebezahlung vom 14. Juni 1895. Berufsstatistik der deutschen Großstädte. Erster Theil, bearbeitet im Kaiserlichen Statistischen Amt, Berlin 1897; Statistik des Deutschen Reichs, Neue Folge, Band 109, Berufs- und Gewerbebezahlung vom 14. Juni 1895. Berufsstatistik der kleineren Verwaltungsbezirke, bearbeitet im Kaiserlichen Statistischen Amt, Berlin 1897. Statistisches Jahrbuch Deutscher Städte, Jg. 6, p. 352; Beiträge zur Statistik des Großherzogthums Hessen, Bd. 48, pp. 237—381; Beiträge zur Statistik des Großherzogthums Baden, Neue Folge, H. 9, Die Berufsbezahlung vom 14. Juni 1895, Karlsruhe 1895, pp. 246—257.
Statistik des Deutschen Reichs, Neue Folge, Band 207, Abteilung VI, Großstädte, Berufs- und Betriebsbezahlung vom 12. Juni 1907; Statistik des Deutschen Reichs, Neue Folge, Band 209, Berufs- und Gewerbebezahlung vom 12. Juni 1907. Berufsstatistik. Abteilung VIII. Kleinere Verwaltungsbezirke, bearbeitet im Kaiserlichen Statistischen Amt, Berlin 1910; Statistik des Deutschen Reichs, Neue Folge, Band 211, Berufsstatische Abteilung X. Die berufliche und soziale Gliederung des deutschen Volkes, Berlin 1913; Beiträge zur Statistik des Großherzogthums Hessen, Band 60, Heft 1, Darmstadt 1910.

Location of the city:

In the Ruhr area: Aachen, Barmen, Cologne, Crefeld, Dortmund, Düsseldorf, Elberfeld, Essen
In Southern and South-Western Germany: Augsburg, Frankfurt a.M., Karlsruhe, Mainz, Mannheim, Metz, Mulhouse,

Munich, Nuremberg, Strasbourg, Stuttgart, Wiesbaden, Würzburg

In North-Western Germany: Altona, Brunswick, Bremen, Cassel, Hamburg, Hanover, Kiel, Lübeck

In Central Germany: Berlin, Chemnitz, Dresden, Erfurt, Halle, Leipzig, Magdeburg, Potsdam

In Eastern Germany: Breslau, Danzig, Frankfurt a.O., Görlitz, Königsberg, Posen, Stettin

1 Missing: 1907 Mulhouse

Some aspects of measurements of hospitals in German and British cities

In Imperial Germany the nursing of the sick was a duty imposed on the States by the Acts of June 6th 1870, March 9th 1893 and June 30th 1900. As various municipalities, associations and contributory sickness funds also began to establish hospitals the number of hospital beds increased from 72,000 in 1877 to 310,000 in 1916. In practice this meant that where there was one hospital bed per 600 inhabitants in 1877 the respective figure for 1916 was one bed per 200 people.⁴⁶

This development was almost entirely due to the rapid establishment of private hospitals. While the number of public hospitals increased between 1877 and 1916 by 73 per cent the number of private hospitals rocketed by some 600 per cent in spite of the fact that a special licence was needed for their establishment and that the private hospitals were granted tax relief only if they were also functioning as teaching and research institutions. The public hospitals, on the other hand, were exempted from many taxes and rates and operated frequently as teaching and training centres for nurses-to-be. The patients admitted often came from the poorer social classes. Thus the public hospitals were "infirmaries for the poor".

In the 44 German cities the number of beds in general hospitals per 1,000 inhabitants was in 1912 greatest in the southern, south-western and eastern cities (see Table 44.) and smallest in metal industry cities (see Table 45.).

Step-wise *regression analysis* was further applied with the number of beds in general hospitals per 1,000 inhabitants in 1912 as the dependent variable. The best model, $R^2 = .45$, (Appendix IX, model 8) was a combination of the variables of the large proportion of civil servants and people in liberal professions and low daily wages. These variables illustrate that beds in general hospitals per inhabitant did not concentrate in wealthy cities.

46. K. O. Rapmund, *Krankenanstalten*, in: *Handwörterbuch der Staatswissenschaften*, Bd. V, Jena 1923, pp. 925—932.

Table 44.

Number of beds in hospitals per 1,000 inhabitants in German cities grouped according to geographical location in 1912.

Number of beds in hospitals per 1000 inhabitants	1912	In the Ruhr area	In Southern and South- Western Germany	In North- Western Germany	In Central Germany	In Eastern Germany	On Average	Tail probability	(N)
		7.0	9.1	6.9	6.5	8.6	7.8	0.023	(44)

Sources: Calculated on the basis of Statistisches Jahrbuch Deutscher Städte, Jg. 21, pp. 110—129.

Geographical location of the city:

In the Ruhr area: Aachen, Barmen, Cologne, Crefeld, Dortmund, Düsseldorf, Elberfeld, Essen

In Southern and South-Western Germany: Augsburg, Frankfurt a.M., Karlsruhe, Mainz, Mannheim, Metz, Mulhouse,

Munich, Nuremberg, Strasbourg, Stuttgart, Wiesbaden, Würzburg

In North-Western Germany: Altona, Brunswick, Bremen, Cassel, Hamburg, Hanover, Kiel, Lübeck

In Central Germany: Berlin, Chemnitz, Dresden, Erfurt, Halle, Leipzig, Magdeburg, Potsdam

In Eastern Germany: Breslau, Danzig, Frankfurt a.O., Görlitz, Königsberg, Posen, Stettin

Table 45.

Number of beds in hospitals per 1,000 inhabitants in 1912 in German cities according to the applied classification.

	Commer- cial Cities	Adminis- trative Cities	Metal Industry Cities	Textile Industry Cities	Garrison Cities	Regional Cities	On Average	Tail prob- ability	(N)
Number of beds per 1000 inhabitants	1912 7.1	8.4	5.9	7.6	8.3	8.5	7.8	0.247	(44)

Sources: Calculated on basis of Statistisches Jahrbuch Deutscher Städte, Jg. 21, pp. 110—129.

Applied classification:

Commercial Cities: Altona, Bremen, Cologne, Frankfurt a.M., Hamburg, Leipzig, Lübeck
Administrative Cities: Berlin, Brunswick, Breslau, Cassel, Dresden, Hanover, Karlsruhe, Königsberg, Magdeburg,
Munich, Strasbourg, Stuttgart

Metal Industry and Mining Cities: Chemnitz, Dortmund, Düsseldorf, Essen, Mannheim, Nuremberg

Textile Industry Cities: Aachen, Augsburg, Barmen, Crefeld, Elberfeld, Mulhouse

Garrison Cities: Kiel, Mainz, Metz, Potsdam

Regional Centres: Danzig, Erfurt, Frankfurt a.O., Görlitz, Halle, Posen, Stettin, Wiesbaden, Würzburg

As mentioned below, it seems that the number of beds in general hospitals per 1,000 inhabitants is not a valid indicator of the standard of hospital services.

Special hospitals and private clinics were a feature of large cities both in Germany and in Britain. In the largest cities and towns of the United Kingdom there were more beds per 1,000 inhabitants in the private hospitals, i.e. hospitals not under public management, than in publicly managed hospitals. This was especially obvious in Dublin, where the churches owned many hospitals (the ratio of hospital beds per 1,000 inhabitants was 9.2). The next highest scores were in Scotland — in Edinburgh with 10 hospitals the ratio was 4.8 and the 17 hospitals in Glasgow made the ratio 3.0 beds per 1,000 inhabitants (see Appendix XII). London had 2.4 beds per 1,000 inhabitants. The main reason for the high ratios in the Scottish and Irish cities was the occurrence of medical teaching at the universities in those particular cities. Edinburgh, for example, was considered in the 19th century the leading medical centre in the whole of Europe. This explanation becomes even more convincing given that there were more hospital beds than average in the Scottish cities even in hospitals which were under public management.⁴⁷

The British tradition of nursing at home might explain the smaller number of hospital beds per number of inhabitants in the British cities as a whole when compared with the figures relating to the German cities. The median of the hospital beds per 1,000 inhabitants of the German cities was 7.75 but in the United Kingdom only 3.4.

Table 46. gives a very telling breakdown of how circumstances differed in relation to the number of hospital beds in Germany and the United Kingdom. While the majority of the 44 German cities had at least 7 beds per 1,000 inhabitants the majority of the British cities included in this study had 4 or less. The actual number of beds in German cities exceeded the recommendations that there should be at least 5 hospital beds per 1,000 inhabitants.⁴⁸

47. Adams 1978, pp. 127—154; Gwendoline M. Ayers, *England's First State Hospitals and the Metropolitan Asylum Board 1867—1930*, London 1971; Palmberg 1895, pp. 201—217.

48. J. Grober, *Krankenhäuser*, in: *Handwörterbuch der Kommunalwissenschaften*, Bd. III, Jena 1924, pp. 137—138.

Table 46.

Number of hospital beds in the 44 German cities and in the 16 towns and cities of the United Kingdom in 1912.

Beds per 1000 inhabitants	44 German cities		16 cities in United Kingdom	
	N	per cent	N	per cent
1.00— 4.00	2	4.5	10	62.5
4.01— 7.00	14	31.8	4	25.0
7.01—10.00	20	45.5	2	12.5
10.01—13.00	8	18.2	0	0

Sources: Calculated on the basis of Comparative Municipal Statistics, Vol. I, 1912—13, pp. 18—19. Statistisches Jahrbuch Deutscher Städte, Jg. 21, pp. 110—129.

On the basis of the above it can be concluded that the numbers of beds in special hospitals were high and the medical and dental services more easily available in cities where the population's standard of education was high, something which can be traced for example in the high proportion of civil servants among the population of those particular cities. The private medical, dental and hospital services required an adequate population base (large cities) and purchasing power (high level of income, commercial cities). So far as the health care services were concerned the industrial cities were clearly in a worse position in this respect.

Indeed, an analysis of various cities and groups of cities in Germany brings out interesting information on how the provision of health services lagged behind in industrial cities compared with other cities. On the other hand, the contrast between the cities of the eastern and the western parts of Germany presented in this study explains only the numbers of beds in general hospitals as well as the numbers of the entire staff engaged in health care services.

Great Britain had been the model country for Germans in many aspects related to health care and hygiene, such as provision of pure water, slum clearance and planning of the

working-class dwellings. The indicators of health care services cannot, however, provide a comparable picture about the level of those services for according to a long English tradition patients were mainly nursed at home. It is perhaps worth noting however, that especially in the early years of the 20th century English Mayors visited German hospitals to acquaint themselves with the most modern hospital equipment and hospital planning. In new German hospitals attention had been paid to the spacious location of its buildings, the efficient use of space inside them and their proximity to nature. Patients with infectious diseases were also separated from other patients in separate buildings (see chapter 14.).

Examples from Nordic countries

Data from the Nordic countries provides further evidence of the differences between the cities with a high incidence of civil servants and the industrial cities. So for example in Helsinki, where the occupational structure was very much dominated by civil servants and other officials, the number of authorized doctors in 1909 was 132/100,000 inhabitants being at the same level as the figure for Frankfurt a.M. for example. On the other hand, Stockholm, which was important also as an industrial and port city — and unlike Helsinki was not the seat of a medical faculty — the proportion of doctors was only 78/100,000 inhabitants.⁴⁹

So far as dentists were concerned their number was also clearly related in the Nordic countries to the size of the city. In 1909 the number of dentists in Helsinki was 24/100,000 inhabitants⁵⁰ — which, incidentally, was more than the respective figure for the leading German cities Strasbourg, Wiesbaden, Hanover, Frankfurt am Main, Karlsruhe, Cassel

49. Suomessa toimiva terveydenhoito- ja sairaanhoitohenkilöstö sekä apteekit vuosien 1860—1975 lopussa, Statistical Yearbook of Finland 1976 (Activ health personel and pharmacies in Finland on 31 December), p. 296; Historisk Statistik för Sverige, översiktstabeller utöver Del I och Del II, publicerade t.o.m. år 1950, Stockholm 1950.

50. Ibid.; Hietala 1984.

and Munich⁵¹ — but the ratio for Stockholm was even higher, 35/100,000 inhabitants.

All in all it was the tendency for the various doctoring services to concentrate in cities where the general standard of income was high and where there consequently was an adequate potential demand.

Regarding hospital services, interesting interrelationships can be discovered between the German and Nordic cities. When planning the establishment of an isolation hospital in Helsinki the City Council sent the Municipal Officer of Health, Quist, and architect Törnquist to investigate foreign solutions. Their itinerary included Copenhagen, Kristiania, Gothenburg, Stockholm and other Swedish towns with modern, practical hospitals. The Council wished journey to extend also to Berlin,⁵² for Prussian regulations insisted, for example, that two square metres' space should be reserved for every hospital bed and that the minimum size of a hospital garden should be one hundred square metres per every hospital bed.⁵³

The visitors sent a memorandum from Berlin proposing the establishment of an isolation hospital, constructed according to modern requirements and "taking into account the principles which are nowadays followed both in Scandinavian countries and in Hamburg and Berlin." In their opinion it was necessary to allocate enough space to a hospital, which should be constructed of stone and which should comprise several pavillons for infectious and non-infectious cases as well as essential offices and outbuildings. In addition it should have a disinfectant guesthouse and wards for mental patients. The isolation hospital was, indeed, built on the same site as the general hospital. A modern hospital was completed in 1894 and its capacity was estimated to suffice for decades to come.⁵⁴

In Germany, on the other hand, the model of 'the Nordic civilized states', such as Sweden, was much admired because there all those who had contracted infectious diseases were treated in public hospitals free of charge. The adoption of this practice was recommended also in the German public hospitals

51. Matzerath 1985, p. 346.

52. Helsingfors stadsfullmäktiges tryckta handlingar 1891.

53. Grober 1924, p. 141.

54. Heiniö 1968, pp. 77—92.

during severe epidemics. German planners also paid much attention to the Danish solution, whereby a large ward of a Copenhagen hospital was divided with screens into several smaller units.⁵⁵

School health services

The school health service is an area connected with both nursing and preventive medicine. It is also a field which can be used as a measure for the general activity of the cities and towns. Its developments were influenced by the initiatives of private individuals, the first of which in Germany was that of J. P. Frank in 1780, as well as by the reports of international congresses where research findings concerning the state of health of school children was presented. Such congresses were Die Naturforscher- und Ärztenversammlug in Innsbruck in 1869, Der hygienische Kongress in Nuremberg in 1877, Die Naturforscher- und Ärztenversammlung in Danzig in 1880 as well as der Internationale Kongress für Hygiene in Geneva in 1882. In Germany the meetings of the German doctors (Deutsche Ärztetage) took a forceful stand on the necessity of school doctors and from the mid-19th century onwards they had demanded the enforcement of sanitary control over schools and the inclusion of doctors in School Commissions. These ideas were pressed, for example, by Rudolf Virchow in 1869⁵⁶ and the importance of medical attention at schools had already been proved in practice for example during the research among Breslau school children carried out by Herman Cohn in 1866, in the course of which he discovered a high incidence of short sightedness among the youngsters. The first textbook on the

55. Grober 1924, pp. 139, 142—144.

56. M. Fürst, Schulgesundheitspflege, in: Handwörterbuch der Kommunalwissenschaften, Bd. III, Jena 1924, pp. 661—671; Paul Schubert, Das Schularztwesen in Deutschland, Hamburg 1905; T. N. Kelynack (ed.), Medical Examination of Schools and Scholars, London 1910. Kelynack mentions that, in 1910, there were school hygiene services available in England and Wales, Scotland, Canada, Australia, New Zealand, U.S.A., France, Norway, Sweden, Denmark and Switzerland.

matter *Schulbuch der Schulhygiene* was published by Baginsky in Berlin in 1877.

The concept of a school health service was considered to cover both the health of the pupils and the condition of the actual school building, including its warmth, its ventilation and the size of classrooms, playgrounds and sports fields.

The Netherlands, in 1865, was the first country in Central Europe to appoint school doctors, followed by Saxony, for in 1867 the city of Dresden appointed three school doctors for a trial period. Brussels was the next to establish such posts, in 1874.⁵⁷ It was, however, only in 1892 when the first German school doctors were appointed outside Dresden. In Leipzig 15 school doctors were appointed for the 42 schools in the city and soon such posts were also established in Saxony and Nuremberg. In Great Britain London got its first school doctor in 1891, the next year saw the appointment of two school doctors in Edinburgh and this trend was followed later by Bradford, Manchester, Salford and Halifax. In 1906 London had one senior school doctor and subordinated to him were 24 assistant doctors.⁵⁸

Soon the school authorities began to pay attention to the children's physical condition. Revelations by army doctors concerning the poor level of physique displayed by recruits during the Boer War led to the establishment of a highly efficient school medical service, which worked in many places in close collaboration with the Public Health Department. In order to combat undernourishment the School Meals Act of 1906 allowed the authorities to provide free school meals for those unable to pay.

In the beginning the school doctors in Germany had only part-time posts. Mannheim, Dortmund, Halle, Chemnitz, Augsburg, Hagen, Kiel and Schöneberg, however, provided a model for the employment of full-time doctors for school health care. Most German school doctors follow the Wiesbaden School Doctor Ordinances, which were based on the principle that every school child would be examined in the beginning of schooling and a special information card was then prepared on

57. Report on the school hygiene institutions in Europe, Oker-Blom, 1910, pp. 388—392.

58. Hasluck 1936, p. 295; cf. Kelynack 1910.

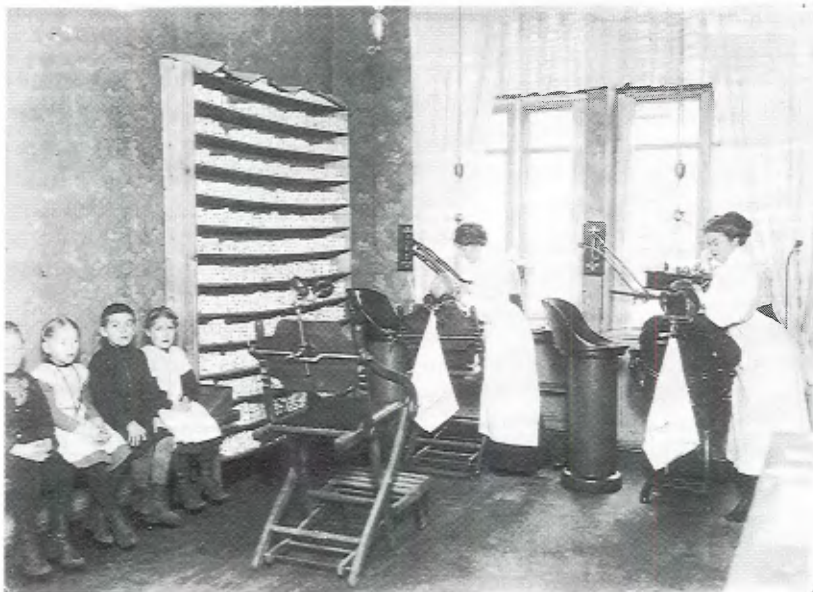


Figure 22.

Axel Aspelund and Th. Weber founded a private dental clinic for schoolchildren in Helsinki in 1907. (Collections of the Helsinki City Museum)

each child. Further regular medical examinations occurred in the second, fourth, sixth and eight school year. In addition the school doctors had a surgery once a month and were also obliged to visit classrooms for observing the children's condition as well as to notify any outbreak of infectious diseases. But the treating of sick children was not included in the tasks of the school doctor.⁵⁹ The Wiesbaden system was followed also in Denmark, Sweden, Norway and Finland. In 1899 the Meeting of the Brandenburg Association of Cities and Towns unanimously recommended that the cities of that province should establish school doctors' posts.⁶⁰

59. System of Wiesbaden started 13.5.1897, Oker-Blom 1910, p. 396.

60. Max Oker-Blom, Medical attendance of the schools, in: Albert Palmberg et.al., School Institutions and Schoolhygiene in the Grand Duchy of Finland. Second International Congress of School Hygiene, London, August 5th—10th 1907, Helsinki 1907.

By the turn of the century much experience had been accumulating on the work of school doctors. Research carried out in Darmstadt in 1901 among 2,958 pupils in elementary and secondary schools indicated that nearly half of them (1,293) had health defects, of which 575 were of the kind requiring constant follow-up. In addition some 80 per cent of schoolchildren were observed to have faulty teeth.⁶¹ By the turn of the century in addition to research reports a great number of works discussing hygiene were published, where school health services were presented as a part of the field.⁶²

Sweden, the pioneer among the Nordic countries, in 1863 appointed school doctors to control the pupils' participation in gymnastics but the School Act of 1878 actually defined in detail the tasks of a school doctor.⁶³ In Stockholm the first post of school doctor was established in 1898 and only a year later, in 1899, Tampere, a large industrial town in Finland, created a post of school doctor for grammar school pupils. The issue of school doctors had, however, been raised somewhat earlier in 1885 at the general meeting of the Finnish Association of Doctors on the initiative of M. af Schulten.⁶⁴

The school health services made progress, partly because it was at the turn of the century that the Municipal Officer of Health for *Helsinki*, Vilhelm Sucksdorf, and the District Health Care Officer, Professor Albert Palmberg, focussed their attention on preventive public health services.⁶⁵

As is discussed elsewhere Palmberg travelled much in Europe.⁶⁶

61. Damaschke 1901, p. 31.

62. Paul Schubert, *Schularztwesen in Deutschland*, Hamburg 1905; Carl Flügge, *Grundriß der Hygiene*, 5. Auflage, Leipzig 1902; *Handwörterbuch der Sozialen Hygiene*, A. Grotjahn and J. Kaup (eds.), Leipzig 1912.

63. Oker-Blom 1910, pp. 387—388.

64. Ensio Alho, *Kouluhygienia, Valtiotieteiden käsikirja*, osa 2, Helsinki 1922, pp. 66—69; Oker-Blom 1910, p. 389.

65. Promemoria of von Wahlberg, Director of the Health Board of Finland, quoted in Niilo Pesonen, *Terveyden puolesta — sairautta vastaan: terveyden- ja sairaanhoito Suomessa 1800- ja 1900-luvulla*, Porvoo 1980, p. 467; Åström 1956, p. 183.

66. A. Palmberg, *Verlden sedd från hygienisk synpunkt. Reseberättelse*, Wiborg 1887. Albert Palmberg was well known for his books on health care: *Allmän hälsovårdslära på grund af dess tillämpning i olika länder*, Borgå 1889. The French Edition of the book was published in 1890, the Spanish Edition in 1892 and the English Edition in 1893.

In 1907, at the Second International Congress on School Hygiene he presented a report, edited by himself, on the Finnish school system and school hygiene as well as on elementary school buildings, under the title *School institutions and school Hygiene in the Grand Duchy of Finland*. The contributors to this work included the leading Finnish hygienic experts and school doctors.⁶⁷

Of the special health care services the school health service was indeed an area which best displayed the desire for progress of individual towns and cities. In this respect Wiesbaden and Dresden and Edinburgh in Scotland became model cities. But it is also worth noting that the innovations in this area of health care spread rapidly both from one German city to another and the rest of Europe at a time when the growth of most of the cities was already slowing down.

In developing health care services cities and towns had an active role to play. This was particularly evident in the establishment of the post of the Municipal Officers of Health, first in British and later in German and Nordic cities.

The developments in each country were being followed keenly all over Europe and channels of influence were operated at many levels and in many directions. But it was not only the big countries and populous metropolises which were the generators of new ideas. Especially in the field of health care streams of innovations flew also from the Nordic countries to Central Europe. Thus for example the Nordic statistics of the causes of death gave new incentives to German experts as was also the case with the Swedish practice of treating patients with infectious diseases free of charge. Some innovators held in high esteem among European experts also came from non-major countries, as the example of the Finnish Professor A. Palmberg shows.

67. A. Palmberg in cooperation with Hjalmar Basilier, Valter Forsius, Lucina Hagman, Victor Heikel, Taav. Laitinen, Max Oker-Blom, Henrik Ståhl and Ivar Wilskman, *School Institutions and School Hygiene in the Grand Duchy of Finland*, Helsinki 1907.

13. Cultural, Leisure and Personal Services

Examples of educational services in German cities

The effect of human capital on the growth and the level of services has been recognized in many studies¹ concerning the recent past. At the turn of the century the following were issues of great interest:

- 1) the use of human capital, i.e. of educated experts in the administration of cities. This question is connected with another one: what was the explanation for the fast growth and success of the German cities? The American Howe presented a hypothesis concerning the effect of administrative experts on the growth of the cities. These experts had been educated at universities and technical institutes. Howe argues that the German militaristic tradition had been converted into a working bureaucracy.² The strength of the educated experts was expressed also in the city exhibitions.
- 2) The standard of education of the population at the turn of the century. It is generally thought that the improving standard of education of the population raised income and purchasing potential. Human capital had an increasing

1. G.A.N. Lowndes, *The Silent Social Revolution: An Account of the Expansion of Public Education in England and Wales, 1895—1965*, 2nd ed., London 1969; Derek Fraser, *The Evolution of the British Welfare State*, London 1973.

2. Frederic C. Howe, *The Modern City and Its Problems*, New York 1915, p. 189.

effect on the demand and the use of services. So it would be interesting to investigate the question of how important the decision-makers considered education services to be. One hint is given for example in the claim that the cities were 'sighing under the burden of educational expenditure'.³

Nevertheless, according to the 1910 survey the *Städte-Zeitung* carried out in German cities, schools were considered unprofitable⁴ (cf. chapter 3).

The comparison of educational systems in various countries is a very difficult task so far as statistical material is concerned. It is difficult to compare the German situation with the English because until 1902 elementary education in England was controlled not by the municipality but by either the churches or locally elected School Boards whose duties were limited by state legislation. Even after 1902 there was little scope for local enterprise except within defined limits. The richer classes generally used private schools. In Scotland, on the other hand, the towns had often run schools at both primary and secondary level since the Reformation and in Edinburgh, until 1858, the Town Council had even controlled the University and its medical faculty. The truth was, however, during the period of this study visitors from the rest of Europe seemed to have little interest in British schools whereas the British found German schools of great interest. For these reasons the following presentation aims only to illustrate those aspects of the German school system that attracted the attention of foreign observers.⁵

Different types of schools in Germany

Before the general act on education for Prussia which came into effect on April 1st 1908, preliminary education had been organized on the basis of several different laws and acts. In

3. D. Eckardt, Die Schullasten der Städte im Jahre 1910, *Städte-Zeitung*, 3.9.1912, pp. 944—954.

4. Ernst Fuchs, Geschichte und Aufgaben des Schulwesens, *Städte-Zeitung*, 3.9.1912, pp. 954—959.

5. Robert Bell and Nigel Grant, *Patterns of Education in the British Isles*, London 1977, pp. 54—79.

different regions in Prussia education was stipulated by landlords edicts, old church regulations, Prussian general law, French acts, provincial acts and special regulations dating from the beginning of the 19th century till the middle of the same century. In addition there were many more recent laws, local administrative regulations and special orders. The primary education system was mainly the responsibility of municipalities (*bürgerliche Gemeinde*) and School Districts (*Schulgemeinden*). However, in addition landed proprietors, factory owners, aristocratic property owners and estate owners were involved to varying degrees. In the countryside the church authorities were carrying the burden of schools. For example in East and West Prussia, Silesia, Pomerania, Saxony and the administrative area of the city of Koblenz as well as in the Cassel area there were denominational schools.⁶

In the 1910's the elementary school system almost all over the German Empire rested on a distinctly denominational basis, i.e. the children attended schools intended for Protestants or Roman Catholic and Jewish children respectively attended the schools for their own denomination. Especially in Bavaria the clerical influence in the primary schools was very strong.⁷ But Jews also maintained primary schools and the municipalities were responsible for the school system in East- and West-Prussia and Catholic Silesia as well as in the province of Rhine. Elsewhere the school system was maintained by special School Associations (*Schulverbände und Schulsozietäten*) according to the Act. Some areas had established the School Associations themselves. In addition, some political bodies had established schools or participated in their maintenance via school funds — for example in Westphalia two thirds of the schools were municipal institutions (*Gemeindeanstalten*).

In the new law it was stipulated that municipalities should bear the school burden but the state participated in the expenses. The pupils had the right to be educated in schools of their own denomination.

In the first clause of the new law it was stated that the establishing of schools was the duty of municipalities or school

6. Kommunales Jahrbuch 1908, Volksschule, pp. 197—208.

7. Dawson 1914, p. 316; Kommunales Jahrbuch 1908, pp. 199, 200.

districts (*Schulverband*). The municipalities and school districts could also join forces (*Gesamtschulverband*).

At the beginning of the century, in 1907, the idea of co-educational schools was advocated in a teachers' conference. The principle of this *Einheitschule* was that the boys and girls could have the same schooling. However, it was considered to lower the intellectual standard of the school.⁸

Regarding primary education the foreign observers were very much impressed by experimental schools in particular "... the purpose of which is to do for education what experimental farms and stations, for example, do for practical agriculture — to test teaching methods and appliances on a small scale before they are introduced into regular use. The idea took root first at Munich in 1909, and has since attracted attention in other parts of the country."⁹

In his study *Municipal Life and Government in Germany* Dawson mentioned some of the new characteristics of the German educational system:

"Here it is only pertinent to call attention to distinctive features of the general organisation of the primary school system. Great changes have been wrought in recent years owing to the institution of a system of inspection and examination by municipal school doctors. The old mechanical method of treating all children alike, whether normal or abnormal in physical and mental capacity, has been abandoned, and special schools for defective children are now common. Schools for stammerers, for the deaf and dumb, for children suffering from defective hearing, for cripples, and for the mentally deficient are found in all the large towns, and the results have proved successful beyond expectations. The Düsseldorf school authority several years ago began orthopaedic gymnastic courses for deformed children, and its example has since been followed in other towns."¹⁰

8. *Kommunales Jahrbuch* 1908, Volksschule, pp. 197—212, especially 210—212.

9. Dawson 1914, pp. 317—318.

10. Dawson 1914, pp. 318. See also *Kommunales Jahrbuch* 1908, pp. 231—241.

Among the various activities of the school authorities the following were well-known elsewhere in the world: arrangements for feeding pupils, games and other outdoor activities, holidays at the seaside and elsewhere, school baths, libraries and museums, concerts and theatrical performances as well as school gardens.¹¹ The local authorities also subsidised day nurseries and children's clubs which were carried on in the larger towns by philanthropic societies.¹²

The towns and cities were equally enterprising in providing continuation and technical schools. The continuation school system was regulated by the State law and some individual legislatures made the establishment of these schools either obligatory on communes, or an option open to them. According to these regulations attendance at continuation schools was obligatory for boys in Bavaria, Saxony, Württemberg, Baden, Hesse and a number of smaller states as well as in large parts of Prussia. The upper age limit for compulsory attendance varied from state to state between 16 and 18 years and normally the full course lasted three or four years for those who had completed the usual seven years elementary education. However, if the elementary schooling had lasted for eight years, the continuation school course was only two years. During the continuation school courses instruction was given for six to eight hours a week, preferably on weekdays, but in some cases classes were even held on Sunday afternoons.¹³

Girls were not excluded from the continuation schools either. Berlin, Munich and Nuremberg had established continuation schools for shop assistants. Three-quarters of the instruction time was given to subjects connected with their own work and the rest to domestic economy.¹⁴ Some large cities in the Rhineland area had established compulsory 'housekeeping schools' and the city of Halle developed a new type of municipal continuation school for girls who had completed the secondary school. The aim of this 'Women's school' was to train

11. *Kommunales Jahrbuch* 1908, pp. 72—74; 217—223, 231, 265; Dawson 1914, p. 319.

12. Dawson 1914, p. 319; A. Südekum, *Fortbildungsschule*, in: *Kommunales Jahrbuch* 1911/12, pp. 336—357.

13. Dawson 1914, pp. 321—323.

14. Dawson 1914, p. 323.



Figure 23.

English mayors among other observers visited different German schools. Continuation school on the Prancstrasse in Munich. (K. Singer, *Hygiene & soziale Fürsorge in München. Eine Auswahl von Einrichtungen in Bild & Zahlen, Munich 1907*)

girls "for their duties as women and mothers" and instruction was given in languages, civic science, hygiene, political economy, domestic economy, pedagogics, the history of art and culture, natural science, history, geography and 'social culture'. In addition special classes were organized for teachers of various subjects, such as languages, and for librarians and apothecaries.¹⁵

According to the *Kommunales Jahrbuch* for 1913—14 there were in Germany at the end of 1912 about 4,400 industrial and trade continuation schools of more or less municipal character.¹⁶

15. Dawson 1914, p. 323; Heim, *Die Fortbildungs- und Fachschulen Deutschlands*, *Städte-Zeitung* 1905, No 14, pp. 339—340; No 15 pp. 370—371; 1905 No 16 pp. 394—395.

16. A. Südekum, *Schul- und Bildungswesen*, in: *Kommunales Jahrbuch 1913/14*, pp. 411—425.

The secondary schools (*Mittelschulen*) had originated out of the need to give general knowledge to those who aimed to join the labour market directly. Partly they overlapped with elementary schools, but they aimed, however, at a greater depth of knowledge. This group of secondary schools included burger schools, rector's schools, boys' higher schools and city schools. In 1910 one half of the girls' higher schools in Germany were municipally owned.

The higher educational establishments delivered general education with the aim of the harmonious development of youth. They consisted of the schools preparing students for scientific careers (*Gymnasium*, *Realschule* etc.)

The State was supposed to be responsible for the provision and also, insofar as fees were inadequate, for the maintenance of the higher schools in general. The local authorities, however, were able to relieve the state of much necessary expenditure¹⁷. This was the case particularly in Prussia and in Saxony. Thus Berlin had 29 municipal high schools of different types, eight being lycees for girls; Dresden had twelve and Leipzig eleven. In Bavaria high schools for boys were mostly established by the State, and those for girls by the local authorities. Of a total of 563 gymnasia in Germany in 1911 331 were maintained by the State, 172 by the communes and 22 by the State and communes jointly; of a total of 223 real-gymnasia the state maintained 51, the communes 159 and the State and communes 11 jointly; while of the middle and higher-grade schools of other types the great majority were maintained by the communes. In Prussia two out of five of the gymnasia were municipal, while most of the other middle and higher-grade schools — including the 'burgher' schools — were municipal. The middle schools (the 'real' schools of various types), indeed, were largely established by municipal initiative, and only much later did the State begin to accept their competition with the old classical gymnasia.¹⁸

The esteem of the school system so increased at the beginning of the 20th century that the Kaiser (according to Ernst Fuchs) stated:

17. Margret Kraul, *Das deutsche Gymnasium 1780—1980*, Frankfurt am Main 1984, pp. 100—120; Dawson 1914, p. 32.

18. Dawson 1914, p. 321.

”So wird unser Vaterland vorangehen auf der Bahn der Aufklärung, der Bahn der Erleuchtung, der Bahn des praktischen Christentums, ein Segen für die Menschheit, ein Hort des Friedens, eine Bewunderung für alle Länder.”¹⁹

At this stage the school system was already being presented as a source of pride for the city and the whole country.²⁰

The aim is now to discuss in the main the higher educational institutes²¹ and only to refer to the elementary schools²² (*Volkschule*) and to secondary schools²³ in passing.

As to elementary education there are some differences between cities of various size. So for example in the larger cities there are fewer pupils per teacher and this could have an effect on the learning results.

When the relation between the number of pupils per teacher in the public elementary schools of cities is compared with the respective figures concerning the whole empire it becomes noticeable that in the cities of this study there are fewer pupils

19. Ernst Fuchs, Förderung des Schulwesens durch die Städte, Städte-Zeitung 3.9.1912, p. 962.

20. Ibid., pp. 960—962.

21. This variable consists of the following types of schools (staatliche, städtische, sonstige): Höhere allgemeine Bildungsanstalten für das männliche und weibliche Geschlecht: A 1. Männliche Anstalten (Gymnasien, Progymnasien, Realgymnasien, Prorealgymnasien, Oberrealschulen, Realschulen, Sonstige höhere allgemeine Bildungsanstalten; A2. Weibliche Anstalten: Höhere Mädchenschulen und Mit höheren Mädchenschulen verbundene Studienanstalten, Gymnasien und Oberrealschulen, Lehrerinnenseminare, Frauenschulen und sonstige Anstalten und Selbständige Studienanstalten, Gymnasialkurse für Mädchen, Frauenschulen und ähnliche Anstalten, Stat. Jb. Deutscher Städte, Jg. 2, pp. 312—314; Jg. 11, pp. 264—267; Jg. 19, pp. 711—716.

22. In the source there is information about the schools in cities according to their ownership under the title Sämtliche, Staatliche, Städtische und Sonstige Volks-(Elementar-)Schulen, Stat. Jb. Deutscher Städte, Jg. 2, pp. 316—317; Jg. 11, pp. 268—279; (in 1910 einschliesslich Hilfsschulen bezw. Hilfsklassen und Schulen in Anstalten und Seminarübungsschulen), Stat. Jb. Deutscher Städte, Jg. 19, pp. 723—725.

23. The group secondary schools (Mittelschulen) consisted of all schools irrespective of their ownership: Sämtliche, Staatliche und Sonstige Mittlere Schulen für das männliche Geschlecht, für das weibliche Geschlecht und für beide Geschlechter, Stat. Jb. Deutscher Städte, Jg. 2, pp. 315—317; Jg. 11, p. 268.

per teacher than in the whole empire. The learning situation is better in the cities (see Table 47).

Table 47.

Number of pupils per teacher in the public elementary schools in Germany in 1901.

	pupils per teacher in 1901
Cities of this study 1900/01	45
Whole German empire	61
Prussia	63
Saxony	66
Württemberg	58
Baden	67
Alsace-Lorraine	43
Hesse	60
Hamburg	38
Mecklenburg-Schwerin	46
Bavaria	59
Lübeck	35

Source: Kommunales Jahrbuch 1908, pp. 210—211; 45 for the 44 cities calculated on the basis of Statistisches Jahrbuch Deutscher Städte, Jg. 11, pp. 269—270.

The secondary schools, being schools for the bourgeoisie, were typically the educational institutions of non-industrialized cities. Their number increased greatly during the research period.²⁴

The expansion of higher educational institutes did not correspond to the growth of population; indeed the number of students per inhabitant decreased a little.

A close examination of the number of students in higher education institutes per inhabitant reveals that the number of

24. In 1900/01 the number of secondary schools (Mittelschulen) was 180 in 42 cities and towns of this study and 10 years later the number of Mittelschulen, Bürgerschulen, höhere oder erweiterte Volksschulen and gehobene Mädchenschulen was totally 346 in 44 cities and towns. Stat. Jb. Deutscher Städte, Jg. 11, pp. 267—268; Jg. 19, pp. 720—722.

Table 48.

Number of students in higher education/1,000 inhabitants in German cities according to the applied classification in 1890, 1900 and 1910.

	Commer- cial Cities	Adminis- trative Cities	Metal Industry Cities	Textile Industry Cities	Garrison Cities	Regional Centres	On Average	Tail probability	(N) ¹
Number of	1890	25.26	30.36	21.68	20.86	30.53	31.66	27.30	0.127
students in	1900	18.36	25.77	17.08	19.78	27.38	26.01	22.79	0.045
higher	1910	17.33	22.08	15.57	20.72	26.70	23.37	20.93	0.056
education/1,000 inhabitants									(41)
Difference in	1890—								(42)
higher education	1910	-7.93	-8.28	-6.12	-0.14	-3.83	-8.29		(44)
								0.003	

Sources: Calculated on the basis of Statistisches Jahrbuch Deutscher Städte, Jg. 3, pp. 314—325; Jg. 11, pp. 260—267; Jg. 19, pp. 711—718, 726—731.

Applied classification:

Commercial Cities: Altona, Bremen, Cologne, Frankfurt a.M., Hamburg, Leipzig, Lübeck

Administrative Cities: Berlin, Brunswick, Breslau, Cassel, Dresden, Hanover, Karlsruhe, Königsberg, Magdeburg, Munich, Strasbourg, Stuttgart

Metal Industry and Mining Cities: Chemnitz, Dortmund, Düsseldorf, Essen, Mannheim, Nuremberg

Textile Industry Cities: Aachen, Augsburg, Barmen, Crefeld, Elberfeld, Mulhouse

Garrison Cities: Kiel, Mainz, Metz, Potsdam

Regional Centres: Danzig, Erfurt, Frankfurt a.O., Görlitz, Halle, Posen, Stettin, Wiesbaden, Würzburg

1 Missing: 1890: Mulhouse, Stettin, Würzburg

1900: Brunswick, Mulhouse

students per inhabitant has decreased between 1890—1910 in all types of cities. This decrease was smallest in the textile industry and the garrison cities. As a whole the garrison cities and the regional centres were in a better position so far as these educational services were concerned, in 1890, 1900 and 1910²⁵ (see Table 48.).

An interesting phenomenon is the difference between the textile cities and the metal industry cities, the number of students in higher education institutes being significantly higher in the former group than in the latter one in 1910. The reason for this was partly the low growth rate of the textile cities (cf. Table 9.). In addition the textile cities had been industrialized earlier and as shown already in chapter 2 these cities had reached, according to the theory of different growth stages, the stage of slackening growth. The attention could be paid to other services than those linked with the urban technology. The greatest decrease in the number of students occurred in the regional centres (average -8.29), in the administrative cities (average -8.28) and the commercial cities (average -7.93 per cent) (cf. Table 48.).

As to individual cities the greatest number of students in higher educational institutes was in Würzburg (36/1,000 inhabitants) and Metz (34/1,000 inhabitants) as well as in Potsdam, Augsburg and Strasbourg (31/1,000 inhabitants in each).

The number of students in higher educational institutes per 1,000 inhabitants was explored also on the basis of *step-wise regression analysis* (Appendix IX, model 9). The dependent variable was the number of students in higher educational institutes per 1,000 inhabitants in 1910.

The best combination of independent variables was the low growth rate of the population, the large proportion of civil servants and people in liberal professions of the total employment and the location of the cities in Southern and South-Western Germany; $R^2 = .57$.

This implies that the number of students in higher educational institutions does not adjust itself to the rapid growth of the cities.

25. Stat. Jb. Deutscher Städte Jg. 3, pp. 314—329; Jg. 11, pp. 260—267; Jg. 19, pp. 711—716.

Table 49.

Number of students in higher education/1,000 inhabitants in German cities grouped according to geographical location in 1890, 1900 and 1910.

	In the Ruhr area	In Southern and Western Germany	In North-Western Germany	In Central Germany	In Eastern Germany	On Average	Tail probability	(N) ¹
Number of students in higher education/1,000 inhabitants	1890 19.26 1900 18.11 1910 16.69	34.34 27.81 25.06	28.83 21.50 20.36	22.59 19.23 17.66	29.35 24.87 22.50	27.30 22.79 20.93	0.009 0.030 0.006	(41) (42) (44)
Difference in higher education	1890-1910 -2.57	-9.28	-8.47	-4.93	-6.85	-6.37		

Sources: Calculated on the basis of Statistisches Jahrbuch Deutscher Städte, Jg. 3, pp. 314—325; Jg. 11, pp. 260—267; Jg. 19, pp. 711—718, 726—731.

Location of the city:

In the Ruhr area: Aachen, Barmen, Cologne, Crefeld, Dortmund, Düsseldorf, Elberfeld, Essen

In Southern and South-Western Germany: Augsburg, Frankfurt a.M., Karlsruhe, Mainz, Mannheim, Metz, Mulhouse, Munich, Nuremberg, Strasbourg, Stuttgart, Wiesbaden, Würzburg

In North-Western Germany: Altona, Brunswick, Bremen, Cassel, Hamburg, Hanover, Kiel, Lübeck

In Central Germany: Berlin, Chemnitz, Dresden, Erfurt, Halle, Leipzig, Magdeburg, Potsdam

In Eastern Germany: Breslau, Danzig, Frankfurt a.O., Görlitz, Königsberg, Posen, Stettin

¹ Missing: 1890: Mulhouse, Stettin, Würzburg

1900: Brunswick, Mulhouse

When studying cities according to their geographical location, it is evident that 'the best level' in higher education was maintained in the cities of Southern and South-Western Germany, secondly in the cities of Eastern Germany (see Table 49.). On the other hand this does not measure the quality of the education which depended much on the activity of each city to invest to school-buildings and to salaries of teachers. Like Adolf Damaschke argues: "Zeige mir die Schule einer Gemeinde, und ich will Dir sagen, was diese Gemeinde wert ist!"²⁶ Also the legislation and the financial support of the States had an impact on the quality of services.

According to the official school census in 1911 about half of all *Realschulen* and *Realgymnasien* in the German Empire were financed by the cities and nearly one third of *Gymnasien*.²⁷

The last variable under investigation was *the number of persons employed in education*, training, research and in the other cultural institutions, per inhabitants. This group concerns teachers in different types of schools and universities, librarians etc. The information for this variable was derived from the censuses of 1895 and 1907.²⁸

The situation was best in 1907 in the garrison cities and in the administrative cities. Very often these cities were also seats of universities and consequently the homes of various academic and cultural institutions. The situation was worst in metal industry and mining cities (cf. Table 50.).

On the basis of Table 51. we can find the regional differences concerning the whole educational sector (primary, secondary and higher education, universities, vocational schools etc). Well ahead of others were the cities of the Southern and South-Western Germany.

At the turn of the century cities displayed *their innovative spirit* not only by supporting primary, secondary and higher education but also by establishing special training institutes for various vocations. A special German concern was with commercial and technical education (e.g. Technical University

26. Damaschke 1901, p. 9; A. Südekum, Schul- und Bildungswesen, in: Kommunales Jahrbuch 1913/14, pp. 328—331.

27. Südekum 1913/14, p. 361.

28. Statistik des deutschen Reichs, Neue Folge, Bd. 107, Bd. 109, Bd. 209, Bd. 211.

Table 50.

Number of persons employed in education, training and research etc. in German cities according to the applied classification in 1895 and 1907.

	Commer- cial Cities	Adminis- trative Cities	Metal industry Cities	Textile industry Cities	Garrison Cities	Regional Centres	On Average	Tail prob- ability	(N) ¹
Number of	1895	805	536	639	752	741	714	0.029	44
persons	1907	801	541	674	806	712	713	0.004	43
employed in									
education, training, research and cultural institutes/ 100,000 inhabitants									

Sources: Calculated on the basis of Statistik des Deutschen Reichs, Neue Folge, Band 107, Berufs- und Gewerbezahlung vom 14. Juni 1895. Berufstatistik der deutschen Großstädte. Erster Theil, bearbeitet im Kaiserlichen Statistischen Amt, Berlin 1897; Statistik des Deutschen Reichs, Neue Folge, Band 109, Berufs- und Gewerbezahlung vom 14. Juni 1895. Berufstatistik der kleineren Verwaltungsbezirke, bearbeitet im Kaiserlichen Statistischen Amt, Berlin 1897; Statistisches Jahrbuch Deutscher Städte, Jg. 6, p. 352; Beiträge zur Statistik des Großherzogtums Hessen, Bd. 48, pp. 237—381; Beiträge zur Statistik des Großherzogtums Baden, Neue Folge, H. 9. Die Berufszählung vom 14. Juni 1895, Karlsruhe 1895, pp. 246—257. Statistik des Deutschen Reichs, Neue Folge, Band 207, Abteilung VI. Grosstädte, Berufs- und Betriebszahlung vom 12. Juni 1907; Statistik des Deutschen Reichs, Neue Folge, Band 209, Berufs- und Gewerbezahlung vom 12. Juni 1907. Berufstatistik. Abteilung VIII. Kleinere Verwaltungsbezirke, bearbeitet im Kaiserlichen Statistischen Amt, Berlin 1910; Statistik des Deutschen Reichs, Neue Folge, Band 211, Berufstatistische Abteilung X. Die berufliche und soziale Gliederung des deutschen Volkes, Berlin 1913; Beiträge zur Statistik des Großherzogtums Hessen, Band 60, Heft 1, Darmstadt 1910.

Applied classification:

Commercial Cities: Altona, Bremen, Cologne, Frankfurt a.M., Hamburg, Leipzig, Lübeck

Administrative Cities: Berlin, Brunswick, Breslau, Cassel, Dresden, Hanover, Karlsruhe, Königsberg, Magdeburg, Munich, Strasbourg, Stuttgart

Metal Industry and Mining Cities: Chemnitz, Dortmund, Düsseldorf, Essen, Mannheim, Nuremberg

Textile Industry Cities: Aachen, Augsburg, Barmen, Crefeld, Elberfeld, Mulhouse

Garrison Cities: Kiel, Mainz, Metz, Potsdam

Regional Centres: Danzig, Erfurt, Frankfurt a.O., Görlitz, Halle, Posen, Stettin, Wiesbaden, Würzburg

1 Missing Mulhouse

Table 51.

Number of persons employed in education, training and research etc. in German cities grouped according to geographical location in 1895 and 1907.

	In the Ruhr area	In Southern and South- Western Germany	In North- Western Germany	In Central Germany	In Eastern Germany	On Average	Tail probability	(N) ¹
Number of persons employed in education, training, research and cultural institutes/ 100,000 inhabitants	1895 528 1907 577	806 815	754 736	729 696	693 689	714 713	0.0007 0.0028	(44) (43)

Sources: Calculated on the basis of Statistik des Deutschen Reichs, Neue Folge, Band 107. Berufs- und Gewerbezahlung vom 14. Juni 1895. Berufsstatistik der deutschen Großstädte. Erster Theil, bearbeitet im Kaiserlichen Statistischen Amt, Berlin 1897; Statistik des Deutschen Reichs, Neue Folge, Band 109. Berufs- und Gewerbezahlung vom 14. Juni 1895. Berufsstatistik der kleineren Verwaltungsbezirke, bearbeitet im Kaiserlichen Statistischen Amt, Berlin 1897; Statistisches Jahrbuch Deutscher Städte, Jg. 6, p. 352; Beiträge zur Statistik des Großherzogtums Hessen, Bd. 48, pp. 237—381; Beiträge zur Statistik des Großherzogtums Baden, Neue Folge, H. 9. Die Berufszählung vom 14. Juni 1895, Karlsruhe 1895, pp. 246—257.
Statistik des Deutschen Reichs, Neue Folge, Band 207, Abteilung VI. Großstädte, Berufs- und Betriebszählung vom 12. Juni 1907; Statistik des Deutschen Reichs, Neue Folge, Band 209, Berufs- und Gewerbezahlung vom 12. Juni 1907. Berufsstatistik. Abteilung VIII. Kleinere Verwaltungsbezirke, bearbeitet im Kaiserlichen Statistischen Amt, Berlin 1910; Statistik des Deutschen Reichs, Neue Folge, Band 211. Berufsstatistische Abteilung X. Die berufliche und soziale Gliederung des deutschen Volkes, Berlin 1913; Beiträge zur Statistik des Großherzogtums Hessen, Band 60, Heft 1, Darmstadt 1910.

Location of the city:

In the Ruhr area: Aachen, Barmen, Cologne, Crefeld, Dortmund, Düsseldorf, Elberfeld, Essen

In Southern and South-Western Germany: Augsburg, Frankfurt a.M., Karlsruhe, Mainz, Mannheim, Metz, Mulhouse, Munich, Nuremberg, Strasbourg, Stuttgart, Wiesbaden, Würzburg

In North-Western Germany: Altona, Brunswick, Bremen, Cassel, Hamburg, Hanover, Kiel, Lübeck

In Central Germany: Berlin, Chemnitz, Dresden, Erfurt, Halle, Leipzig, Magdeburg, Potsdam

In Eastern Germany: Breslau, Danzig, Frankfurt a.O., Görlitz, Königsberg, Posen, Stettin

¹ Missing Mulhouse

in Charlottenburg) but also the training of the native administrative personnel.

At the beginning of this century it was considered that those with Realschule education could serve in the middle ranks of the civil and municipal service. The requirement in other cases was graduation from a special institute for training officials (*Beamtenschule*). According to an enquiry of Prussian municipal officials carried out in 1912 only 24 per cent of trainee municipal officials possessed a higher degree (*Berechtigungsschein zum einjährigen Militärdienst*). In Ascherleben a special form of training (*Gemeinde-beamtenschule*) for municipal officials was started on April 4, 1910. During the two year training period the students (14 years old) received instruction in general education, foreign languages and practice in a model bureau.

In the same years the city of Düsseldorf started a continuation school for the middle-rank municipal officials (*Verwaltungsbeamtenschule*). They were taught subjects relevant for their practical work (e.g. *Allgemeine Staats- und Verwaltungskunde, Steuerkunde, Rechtskunde, Rechnen* etc.)

This model was certainly followed in Kiel and Dortmund.²⁹ A special municipal police school was also established in Düsseldorf in 1901 (*Die Rheinische Polizeischulen*), which trained some 1,850 students by 1910. This example was followed, among the cities covered in this study, by Dortmund, Munich and Stuttgart.³⁰

For training higher ranking officials especially Burgomasters, specialist academies were established in Düsseldorf (*Akademie für Kommunale Verwaltung in Düsseldorf*) in 1911 and in Cologne the *Hochschule für kommunale und soziale Verwaltung in Köln* in 1912. Cities must be given also credit for showing active interest and providing financial support for a number of school of economics, which were established in

29. H. Lindemann, *Kommunale Beamte*, in: *Kommunales Jahrbuch* 1910, pp. 485—486; A. Südekum, *Kommunale Beamte*, in: *Kommunales Jahrbuch* 1911/12, pp. 498—499; *Städte-Zeitung* 11.4.1911; Bunde, *Verwaltungs-beamtenschulen*, in: *Handwörterbuch der Kommunalwissenschaften*, Bd. IV, Jena 1924, pp. 317—320.

30. Lasch, *Polizeischulen*, in: *Handwörterbuch der Kommunalwissenschaften*, Bd. III, Jena 1924, pp. 480—481.

German cities at the turn of the century (e.g. in Leipzig and Aachen in 1898, Cologne in 1901, Mannheim in 1908 and Munich in 1910). The running costs of these schools were shared, not only by the respective cities but also by private individuals and tradesmen's associations. These schools also attracted students from abroad, for example in Leipzig the proportion of foreign students in the academic year 1913/14 was 60 per cent.³¹

Leisure services: examples of libraries, theatres, parks, restaurant and personal services

Of all the topics concerning social history perhaps the most researched in recent years have been those related to leisure time and its use. British social history has been interested in the amusements and public houses of Victorian England. Germans have investigated their *Bierhallen* or the increase of alcohol consumption in relation to urbanization. Many of the services associated with leisure time were considered by contemporaries as necessary in order to keep the working classes off the streets, as the establishment of reading rooms and libraries shows.³² The fear of the harmful influences of large cities, alcoholism, crime and prostitution awoke the decision-makers to the need to consider measures for directing people towards more healthy ways of living. Parks, sports grounds and private gardens were means to divert them from undesirable tracks. Services aimed to improve leisure time

31. Edler von Hoffmann, Akademie für kommunale Verwaltung in Düsseldorf, in: Handwörterbuch der Kommunalwissenschaften, Bd. I, Jena 1918, pp. 13—15; Christian Eckert, Handelshochschulen, in: Handwörterbuch der Kommunalwissenschaften, Bd. II, Jena 1922, pp. 469—477; Christian Eckert, Hochschulen, in: Handwörterbuch der Kommunalwissenschaften, Bd. II, Jena 1922, pp. 528—539.

32. Briggs 1975, pp. 47—49; Jürgen Reulecke and Wolfram Weber (eds.), Fabrik, Familie und Feierabend. Beiträge zur Sozialgeschichte des Alltags im Industriezeitalter, Wuppertal 1978; H. E. Meller, Leisure and the Changing City 1870—1914, London 1976.

activities were partly based on an assumption about the hereditary nature of criminality.

Attention was hardly ever paid to leisure time and recreation activities when presenting the attractions provided by industrialization. Neither are the leisure services included among the productive activities in the hierarchy of needs in the cities, which was described earlier. Also in the German material the investments in leisure time services appear significantly only after the turn of the century when articles for example on increasing the numbers of public baths and parks were frequently published.³³

Libraries for decision-makers and citydwellers

In his study *Aufgaben der Gemeindepolitik*. Adolf Damaschke already emphasized the importance of the human capital. In these he included public libraries, reading rooms, scholarly lectures, theatrical performances and various exhibitions.³⁴

Different undertakings for establishing *civic libraries* can be seen as the reaction of towns to existing needs. Calls for their foundation started to appear in different magazines only at the beginning of the 20th century when it was thought that the growing bureaucracy and city administration needed to keep in touch with current professional knowledge. Also it was thought that entrepreneurs and tradesmen would benefit from learning the legal aspects relating to their own particular field of business. Therefore the civic libraries should include in their stock books on the following topics: technology, jurisprudence and political science. In particular those working in the

33. O. Schwarz, Heranziehung der Industrie, Städte-Zeitung 25.3.1904, pp. 335—336.

Compare with Deutsches Städtebuch, Illustrierte Reise und Verkehrsalbum zur Hebung und Förderung des Fremden- und Geschäftsverkehrs 1907; Information on parks is included in Subdivision "Areas", Stat. Jb. Deutscher Städte, Jg. 10, pp. 7—8; Jg. 19, pp. 452—455.

34. Adolf Damaschke (Vorsitzender des Bundes der Deutschen Boden-reformer), Aufgaben der Gemeindepolitik, 4. Auflage, Jena 1901, pp. 9—41.

municipal administration and administration of justice were also considered to need academic literature and for engineers in particular it was thought to be important to keep abreast with the latest construction technology.³⁵

In 1908 the *Kommunale Rundschau* published a series of articles aiming to promote the idea of the establishment of civic libraries in Germany, because, according to the writer, H. Düring, so far the cities had paid too little attention to this matter. Düring emphasized especially that one could expect the civic libraries not only to provide information but also contacts abroad.

This interesting aspect demonstrates well the pressures prevalent in Germany to keep in touch with the latest developments. According to Düring a municipal library could be established even with small capital outlay because it was likely that various departments of the civic administration already had a number of interesting and valuable volumes.³⁶

The advocates of municipal libraries had mainly three groups of potential customers in mind:

1. the decision-makers
 2. the inhabitants of the city who were devoted to self-education and selfimprovement
 3. tradesmen and industrial entrepreneurs in need of professional information on legal and political matters.
- Therefore literature required by different occupational groups should be available.

Many civic libraries originated from monastic or church libraries whereas some were indebted to a few enlightened burghers, such as Professor Ferdinand Wallraf, for the donation of their valuable book collections.³⁷

35. H. Düring, Die Gründung der Stadtbibliotheken I, *Kommunale Rundschau* 31.3.1908, pp. 219—228; H. Düring, Die Gründung der Stadtbibliotheken II, *Kommunale Rundschau* 30.4.1908, pp. 262—267; H. Düring, Die Gründung von Stadtbibliotheken (Schluss), *Kommunale Rundschau* 30.5.1908, pp. 306—310; Jaeschke, *Bibliotheken, Bücher- und Lesehallen, Handwörterbuch der Kommunalwissenschaften*, Bd. I, Jena 1918, p. 415.

36. Düring urges the reading of Hinrichs' *Monthly Gazette and des Catalogue mensuel de la librairie française*.

37. Kanonikus and Professor Ferdinand Wallraf left in his will his own library (14 303 issues) for the town of Cologne, Düring, *Kommunale Rundschau* 3.3.1908, p. 221.

This kind of old established library operated mostly in old administrative and commercial centres as well as in some former Hanseatic towns, and many of them were established already before the 18th century (e.g. Augsburg 1562, Bremen 1660, Danzig 1591, Frankfurt am Main 1668, Halle 1615, Hamburg 1529, Hanover 1440, Königsberg 1540, Magdeburg 1525, Nuremberg 1583) and the library in Düsseldorf in 1770. As Düring in his article demonstrates many of these libraries were quite successful also in increasing their stock of books later on. Consequently the biggest libraries, measured by the number of volumes in stock, were in those cities which had demonstrated also in other areas exceptional activity in the development of the town, such as Frankfurt am Main, Hamburg, Cologne, Mainz, Breslau, Bremen and Wiesbaden. Also the industrial cities, led by the textile cities, were active in the establishment of municipal libraries during the 19th century and in the early years of the 20th century (e.g. Aachen 1831, Chemnitz 1869, Elberfeld 1901, Breslau 1865, Dortmund 1870, Essen 1905).³⁸ Düsseldorf was the first German city to open a public reading room adjacent to the civic library.³⁹

This short outline of the development of civic libraries displays, however, only a small part of the general enthusiasm for establishing libraries. In many cities there were also *public libraries* and reading rooms launched by state funds as well as libraries run by private associations.

So far as this study is concerned information about public libraries in Germany is available from the years 1895, 1899, 1900, 1901 and 1911.⁴⁰

Public libraries and reading rooms

In Germany *reading rooms* were established according to the Anglo-American model in connection with public libraries for all the inhabitants irrespective of their occupation. Elberfeld,

38. Düring, *Kommunale Rundschau* 31.3.1908.

39. Frederic C. Howe, *European Cities at Work*, New York 1913, p. 61.

40. Information concerning libraries is available for 1895, 1899, 1900, 1901 and 1911. For example Allein oder vorzugsweise gelehrten Zwecken oder

Charlottenburg, Düsseldorf, Dortmund, Dresden and Brunswick were among the first cities to establish extensive public libraries with reading rooms.⁴¹ The idea of reading rooms which were considered to offer a competitive alternative way for workers to spend their leisure time and to stimulate their interest in culture as well as to refine their tastes and habits, were launched in Germany on lines similar to the big cities of United States and Great Britain,⁴² which also formed a reference group for German cities.⁴³

In his research Thomas Kelly has proved erroneous the currently⁴⁴ prevailing scholarly opinion that public libraries were primarily for the working class. According to Kelly the true picture is much more subtle than previously assumed. It is true that everywhere labourers, artisans, clerks and shop assistants, i.e. the working and lower middle classes are recorded in considerable numbers and infinite variety. But everywhere there was also at least a sprinkling, and often considerably more than that, of readers from the higher classes.

The list of the Manchester lending library has been quoted as an example and it contains, among its total 33,026 readers, 86 accountants, 111 architects, 2 authors, 1 banker, 2 barristers, 139 clergymen, 4 editors, 40 gentlemen, 3 lecturers, 6 librarians, 56 medical men, 39 military men, 35 missionaries, 2 professors, 1 publisher, 108 schoolmasters, 20 schoolmistresses and 18 solicitors. According to the returns of the Leeds library 81 per cent of its customers were from the working class and 19 per cent had professional or middle class backgrounds.

spezieller Fachausbildung dienende öffentliche Bibliotheken und Allein oder vorzugsweise der allgemeinen Volksbildung dienende öffentliche Bibliotheken und Lesehallen, Stat. Jb. Deutscher Städte, Jg. 10, p. 226; Jg. 20, p. 525.

41. Düring, *Kommunale Rundschau* 30.4.1908, p. 310.

42. Jaeschke 1918, pp. 414—415; Briggs 1975, p. 197; G. Fritz, *Volksbildungswesen*, in: *Kommunales Jahrbuch* 1909, Teil I, pp. 346—349; William Mumford, *Pennyrate. Aspects of British Public Library History 1850—1950*, London 1951; Board of Education, *Public Libraries Committee. Report on Public Libraries in England and Wales*, 1927.

43. Albert Südekum, *Lesehallen*, in: *Handwörterbuch der Kommunalwissenschaften*, Bd. III, Jena 1924, p. 282.

44. Thomas Kelly, *A History of Public Libraries in Great Britain, 1845—1975*, (The Library Association), London 1977, pp. 81—83.

In Germany there were significantly more public libraries in the large nonindustrialized centres; when measuring the use of libraries by the number of borrowers and the number of libraries per borrower the results indicate that the library services increase in line with the size of a centre. In 1910 a total of 329 German towns and cities were known to have public libraries and 168 to have reading rooms.

From the foreign observer's point of view new ideas introduced by German cities were most interesting as far as library services were concerned. For example Munich launched the first public music library due to "music author" Marsop. It started to lend out collections of music in the same way as books. This successful model of Munich was followed by Frankfurt a.M., Berlin, Charlottenburg, Cassel and Stuttgart.⁴⁵ In Berlin one of the public reading rooms was reserved for children from six to thirteen years. The childrens' reading rooms were common in English and American cities. At the age of fourteen children were allowed to use the adults' reading rooms. In many other German towns children were provided for in a similar way by School associations subsidized by the local authorities. One purpose was to get children off the streets and to awaken their interest in literature.⁴⁶

As regards other cultural services foreign observers were impressed by the way many towns regularly arranged winter courses of popular lectures on scientific, literary and historical subjects and still more assisted associations and institutions which in one way or other aimed at bringing knowledge of this kind within the reach of the working class.⁴⁷

In the United Kingdom libraries and art museums assumed a definite position in municipal services. All 16 cities included in this study had established public libraries, museums and art galleries by 1912. The following figures show that issues of

45. Dawson 1914, p. 314.

46. Jaeschke 1918, pp. 417—418; G. Fritz, Volksbildungswesen, in: *Kommunales Jahrbuch* 1909, Teil I, Jena 1909, p. 350; Dawson 1914, pp. 314—315.

47. K. Dziazko and R. Pietschmann, *Bibliotheken*, in: *Handwörterbuch der Staatswissenschaften*, Dritte gänzlich umgearbeitete Auflage, Bd. II, Jena 1909, p. 1034.

Table 52.

Issues of books per capita of population in some cities and towns in U. K. during the year 1912—1913

London	1.70
Birmingham	2.18
Liverpool	2.34
Manchester	2.51
Sheffield	1.41
Leeds	2.48
Bristol	1.15
Newcastle	1.83
Cardiff	3.71
Swansea	1.94
Glasgow	1.67
Edinburgh	2.34
Dundee	2.14
Aberdeen	1.60
Belfast	1.13

Source: Comparative Municipal Statistics, Vol I, 1912—1913, pp. 50—51.

books per inhabitant was greatest in Cardiff, Manchester, Leeds, Liverpool, Edinburgh and Dundee. This may indicate that the population especially in industrial cities and in some Scottish towns were actively using the services of public libraries.⁴⁹ (see Table 52).

Issues of books per head of population in library areas was in 1875—1877 0.93 in England and Wales whereas in Scotland it was 1.23. In 1913—14 the figure for England was 2.27, for Wales 1.43 and for Scotland 2.22.⁴⁸

48. Kelly 1977, pp. 517—518, Appendix VI (Figures for those years are calculated by Kelly from Parliamentary Returns of Public Libraries 1876 and 1877; Figures for the years 1913—1914 are calculated from W.G.S. Adams, Report on Library Provision and Policy to the Carnegie United Kingdom Trustees, Dufferline 1915).

49. Comparative Municipal Statistics, Vol I 1912—1913, pp. 50—51.

Table 53.

The expenditure of large towns for various cultural purposes, viz., libraries, art and science, theatre and music in 1912.

Town	Population	Libraries and reading-rooms £	Art and science £	Theatre and music £	Miscellaneous £	Total £
Aachen	158,800	1,720	4,850	16,680	2,800	26,050
Düsseldorf	390,000	5,725	8,350	26,500	4,105	44,680
Essen	307,000	2,350	5,320	15,320	270	23,460
Cassel	155,300	930	—	3,580	—	4,510
Chemnitz	287,800	2,850	3,130	18,130	—	24,110
Danzig	173,900	3,750	7,140	500	120	11,510
Frankfurt a.M.	431,900	7,660	32,530	30,280	5,460	75,930
Mannheim	217,700	1,080	16,800	27,930	2,870	48,680
Total	2,122,400	26,065	78,320	135,340	19,205	258,930
Expend. per inhab.		2·9d.	8·9d.	15·3d.	2·2d.	29·3d.
Leeds	445,600	12,992	1,033	346	—	14,371
Cardiff	184,600	7,706	—	—	—	7,706
Dundee	165,300	6,506	—	—	—	6,506
Birmingham	840,200	21,726	23,662	—	—	45,388
Glasgow	1,105,200	27,306	13,324	4,585	29,348	74,563
Manchester	731,700	31,792	10,427	5,609	4,126	51,954
Huddersfield	107,800	2,028	5,069	—	—	7,097
Newcastle	271,300	848	2,569	495	10	3,922
Leicester	227,200	4,020	13,091	284	—	17,395
Salford	231,400	7,778	1,619	—	—	9,397
Bradford	290,300	8,295	2,280	—	—	10,575
Bolton	180,900	6,718	—	—	—	6,718
Sheffield	454,600	9,720	4,183	2,872	—	16,775
Bristol	359,400	8,674	1,500	—	—	10,174
Total	5,595,500	156,109	78,757	14,191	33,484	282,541
Expend. per inhab.		6·7d.	3·4d.	0·6d.	1·5d.	12·1d.

Source: Dawson, William Harbutt, Municipal Life and Government in Germany, London 1914, pp. 312—313.

Dawson has presented some comparative estimates of the expenditure some German cities (Aachen, Düsseldorf, Essen, Cassel, Chemnitz, Danzig, Frankfurt am Main, Mannheim) and some British cities (Leeds, Cardiff, Dundee, Birmingham, Glasgow, Manchester, Huddersfield, Newcastle, Leicester, Salford, Bradford, Bolton, Sheffield and Bristol) had invested per inhabitant in various leisure time services (see Table 53.), such as libraries, arts and science, theatre and music etc. exclusive of all expenditure on schools in the year 1912.

According to Dawson's results so far as the libraries were concerned, the average expenditure per inhabitant in Britain was 6.7 pence and in German cities a mere 2.9 pence. The reason for this is that in Britain there were collected a special "penny rate" for libraries. On the other hand the German cities could collect amusement tax. On the other hand Dawson's table indicates that the German cities were much more willing to invest in other types of leisure time services than the British towns and cities. The expenditure for art and science in the German cities was 8.9 pence while the British cities provided for their inhabitants with arts and science services to the tune of only 3.4 pence per inhabitant. The respective figures for theatre and music were 15.3 pence in Germany and in Britain a minimal 0.6 pence.⁵⁰

Theatres

When comparing the number of those occupied in music and theatrical work to the number of population in the city in 1907 the ratio was greatest in Wiesbaden (0.65 per cent), Brunswick (0.59 per cent), Munich (0.53 per cent), Mannheim (0.52 per cent), Frankfurt am Main (0.48 per cent) and in Karlsruhe (0.47 per cent). The proportion earning their living from theatre and music was smallest in Posen (0.16 per cent), Barmen (0.16 per cent) and Danzig (0.17 per cent).⁵¹

50. Dawson 1914, p. 313.

51. Calculated on the basis of Statistik des Deutschen Reichs, Neue Folge, Bd. 209, Bd. 211.

In comparing the proportions of people living from music and the theatre in various groups of German cities in 1895 and 1907 (see Table 54.) it is again obvious that the commercial and administrative centres were ahead of all others in both cross-sectional years. These groups of cities had enough potential demand and purchasing power.

When grouping the cities according to their geographical location on the top are the cities in North-Western and in Southern and South-Western Germany and in the third place come the cities in Central Germany. It seems that in these groups of cities the longer traditions of theatres and orchestra still keep them well ahead of cities in Eastern Germany or in the Ruhr area (see Table 55.).

In their support of drama the German cities followed three methods. The town either owned a theatre and worked it, owned the theatre and leased it, or where the town did not have a theatre of its own, it subsidized privately owned theatres and these were often entitled to describe themselves as municipal theatres. Nuremberg was one of the first cities to establish a municipal theatre and one can generalize by saying that textile cities, such as Elberfeld, were particularly active to do so too. It was estimated that over 50 German towns and cities had at least one theatre of their own. Charlottenburg had both a theatre and an opera house, which were both leased to companies. The city owned two theatres also in Frankfurt am Main, Leipzig and Mannheim. Of these towns 32 had over 80,000 inhabitants and 15 between 50,000 and 80,000 inhabitants. The list includes, besides cities already mentioned, also the following cities with a population exceeding 150,000: Cologne, Aachen, Nuremberg, Düsseldorf, Bremen, Erfurt, Breslau, Halle, Magdeburg and Strasbourg. On the other hand also minor towns had theatres, such as Würzburg (80,000 inhabitants), Freiburg-im-Breisgau (83,000), Frankfurt an der Oder (64,000) and Liegnitz (60,000); though several towns with a population not larger than 30,000 also owned theatres, for example Oppeln, Schweidnitz and Neisse.

Of the towns which both owned and worked theatres the most notable were Mannheim (since 1839), Freiburg-in-Baden (since 1868), Strasbourg (since 1886), Mulhouse, Kiel, Leipzig, Cologne, Dortmund, Colmar and Königshütte. The usual

Table 54.

Number of persons employed in the theatre and in the field of music/100,000 inhabitants in German cities according to the applied classification in 1895 and 1907.

		Commer- cial Cities	Adminis- trative Cities	Metal Industry Cities	Textile Industry Cities	Garrison Cities	Regional Centres	On Average	Tail prob- ability	(N) ¹
Number of persons employed in the theatre and in the field of music/ 100,000 inhabitants	1895	327	333	212	113	177	255	255	0.0007	(44)
	1907	365	397	293	201	257	274	316	0.009	(43)

Sources: Calculated on the basis of Statistik des Deutschen Reichs, Neue Folge, Band 107. Berufs- und Gewerbezahlung vom 14. Juni 1895, Berufsstatistik der deutschen Großstädte. Erster Theil, bearbeitet im Kaiserlichen Statistischen Amt, Berlin 1897; Statistik des Deutschen Reichs, Neue Folge, Band 109. Berufs- und Gewerbezahlung vom 14. Juni 1895, Berufsstatistik der kleineren Verwaltungsbezirke, bearbeitet im Kaiserlichen Statistischen Amt, Berlin 1897; Statistisches Jahrbuch Deutscher Städte, Jg. 6, p. 352; Beiträge zur Statistik des Großherzogtums Hessen, Bd. 48, pp. 237—381; Beiträge zur Statistik des Großherzogtums Baden, Neue Folge, H. 9. Die Be- rufszählung vom 14. Juni 1895, Karlsruhe 1895, pp. 246—257. Statistik des Deutschen Reichs, Neue Folge, Band 207, Abteilung VI. Großstädte, Berufs- und Betriebszahlung vom 12. Juni 1907; Statistik des Deutschen Reichs, Neue Folge, Band 209, Berufs- und Gewerbezahlung vom 12. Juni 1907. Berufsstatistik. Abteilung VIII. Kleinere Verwaltungsbezirke, bearbeitet im Kaiserlichen Statistischen Amt, Berlin 1910; Statistik des Deutschen Reichs, Neue Folge, Band 211, Berufsstatistische Abteilung X. Die berufliche und soziale Gliederung des deutschen Volkes, Berlin 1913; Beiträge zur Statistik des Großherzogtums Hessen, Band 60, Heft 1, Darmstadt 1910.

Applied classification:

Commercial Cities: Altona, Bremen, Cologne, Frankfurt a.M., Hamburg, Leipzig, Lübeck

Administrative Cities: Berlin, Brunswick, Breslau, Cassel, Dresden, Hanover, Karlsruhe, Königsberg, Magdeburg, Munich, Strasbourg, Stuttgart

Metal Industry and Mining Cities: Chemnitz, Dortmund, Düsseldorf, Essen, Mannheim, Nuremberg

Textile Industry Cities: Aachen, Augsburg, Barmen, Crefeld, Elberfeld, Mulhouse

Garrison Cities: Kiel, Mainz, Metz, Potsdam

Regional Centres: Danzig, Erfurt, Frankfurt a.O., Gölitz, Halle, Posen, Stettin, Wiesbaden, Würzburg

1 Missing 1907: Mulhouse

Table 55.

Number of persons employed in the theatre and in the field of music/100,000 inhabitants in German cities grouped according to geographical location in 1895 and 1907.

	In the Ruhr area	In Southern and South- Western Germany	In North- Western Germany	In Central Germany	In Eastern Germany	On Average	Tail probability	(N) ¹
Number of persons employed	1895 1907	150 243	285 364	341 367	264 314	214 258	255 316	(44) (43)
in the theatre and in the field of music/100,000 inhabitants							0.007 0.064	

Sources: Calculated on the basis of Statistik des Deutschen Reichs, Neue Folge, Band 107, Berufs- und Gewerbezahlung vom 14. Juni 1895. Berufsstatistik der deutschen Großstädte. Erster Theil, bearbeitet im Kaiserlichen Statistischen Amt, Berlin 1897; Statistik des Deutschen Reichs, Neue Folge, Band 109, Berufs- und Gewerbezahlung vom 14. Juni 1895. Berufsstatistik der kleineren Verwaltungsbezirke, bearbeitet im Kaiserlichen Statistischen Amt, Berlin 1897; Statistisches Jahrbuch Deutscher Städte, Jg. 6, p. 352; Beiträge zur Statistik des Großherzogtums Hessen, Bd. 48, pp. 237—381; Beiträge zur Statistik des Großherzogtums Baden, Neue Folge, H. 9. Die Berufszählung vom 14. Juni 1895, Karlsruhe 1895, pp. 246—257. Statistik des Deutschen Reichs, Neue Folge, Band 207, Abteilung VI. Großstädte, Berufs- und Betriebszahlung vom 12. Juni 1907; Statistik des Deutschen Reichs, Neue Folge, Band 209, Berufs- und Gewerbezahlung vom 12. Juni 1907. Berufsstatistik. Abteilung VIII. Kleinere Verwaltungsbezirke, bearbeitet im Kaiserlichen Statistischen Amt, Berlin 1910; Statistik des Deutschen Reichs, Neue Folge, Band 211, Berufsstatistische Abteilung X. Die berufliche und soziale Gliederung des deutschen Volkes, Berlin 1913; Beiträge zur Statistik des Großherzogtums Hessen, Band 60, Heft 1, Darmstadt 1910.

Location of the city:

In the Ruhr area: Aachen, Barmen, Cologne, Crefeld, Dortmund, Düsseldorf, Elberfeld, Essen
 In Southern and South-Western Germany: Augsburg, Frankfurt a.M., Karlsruhe, Mainz, Mannheim, Metz, Mulhouse, Munich, Nuremberg, Strasbourg, Stuttgart, Wiesbaden, Würzburg
 In North-Western Germany: Altona, Brunswick, Bremen, Cassel, Hamburg, Hanover, Kiel, Lübeck
 In Central Germany: Berlin, Chemnitz, Dresden, Erfurt, Halle, Leipzig, Magdeburg, Potsdam
 In Eastern Germany: Breslau, Danzig, Frankfurt a.O., Görlitz, Königsberg, Posen, Stettin

1 Missing 1907: Mulhouse

practice, however, was to lease the theatre to an actor-manager; though invariably on the subsidy principle.⁵²

Parks

Greater importance came to be attached to parks with the rise of pastoral romanticism and revulsion from the effects of urbanization. Maintaining a relationship with nature was considered important for the well-being of human beings. For example in an article, published by the *Städte-Zeitung* in 1905, the writer maintained that German people had an innate love of nature and that woods, parks, gardens and green commons were thought to be important factors in maintaining the health of the German population. Rambling in the fresh air was felt to be the best way of relaxation after a hard day's work.⁵³

According to a municipal park inspector, Tapp, from Danzig it was more common for the cities of South-Western and Western Germany to establish new parks than was the practice in the eastern parts of the country. Tapp also observed that a well kept garden has a healing effect to the brutal human being when awakening his love for nature and a sense of order and beauty. Gardens and sports grounds were particularly important for young people, especially in the densely populated areas.

In more general terms the beautifying of cities had become a fashionable idea in the 19th century. In 1824 the city of Magdeburg commissioned new plans for its parks and gardens from Peter Joseph Lenne, a head gardener, and the cities of Berlin and Dresden were provided with new plans in the mid 19th century, in 1856—1868, by Friedrichstein and Gustav Meyer.⁵⁴

52. Dawson 1914, pp. 328—330; M. Martersteig, Theater und Orchester, in: Handwörterbuch der Kommunalwissenschaften, Bd. III, Jena 1924, pp. 175—185.

53. G. Pinkenburg, Städtische Park- und Gartenanlagen, *Städte-Zeitung* 17.2.1905.

54. Tapp, Städtische Gartenanlagen, *Städte-Zeitung* 18.1.1904, pp. 192—194; Henriette Meynen, Die Kölner Grünanlagen. Die Städtebauliche und gartenarchitektonische Entwicklung des Stadtgrüns und des Grünsystem Fritz Schumachers, Düsseldorf 1979.

Table 56.

Public woodlands and parks inside the city boundaries, m² per inhabitant in 1910 in German cities grouped according to geographical location, bracketed cases without public woodlands.

	In the Ruhr area	In Southern and South-Western Germany	In North-Western Germany	In Central Germany	In Eastern Germany	On Average	Tail probability	(N)
Public woodlands and parks squaremeter per inhabitant	1910 21.1 (3.3)	49.5 (6.6)	11.9 (5.8)	16.5 (6.2)	22.2 (4.5)	27.2 (5.4)	0.048 (0.522)	(44) (44)

Sources: Calculated on the basis of Statistisches Jahrbuch Deutscher Städte, Jg. 19, pp. 452—455.

Geographical location of the city:

In the Ruhr area: Aachen, Barmen, Cologne, Crefeld, Dortmund, Düsseldorf, Elberfeld, Essen

In Southern and South-Western Germany: Augsburg, Frankfurt a.M., Karlsruhe, Mainz, Mannheim, Metz, Mulhouse, Munich, Nuremberg, Strasbourg, Stuttgart, Wiesbaden, Würzburg

In North-Western Germany: Altona, Brunswick, Bremen, Cassel, Hamburg, Hanover, Kiel, Lübeck

In Central Germany: Berlin, Chemnitz, Dresden, Erfurt, Halle, Leipzig, Magdeburg, Potsdam

In Eastern Germany: Breslau, Danzig, Frankfurt a.O., Görlitz, Königsberg, Posen, Stettin

On the basis of the statistical material from German cities Tapp's analysis is quite right. Table 56. indicates that the cities of Southern and South-Western Germany are more advanced as far as the parks and public woodlands within the city boundaries are concerned. A reason for this is that the cities owned large areas of public woodland. The amount of area classified as woodland, which furthermore was mostly owned by the city itself (Stadtwald), was quite high in the following cities in 1910:

Table 57.

Areas of public woodland in certain German cities in 1910.

City	Area of public woodland, ha
Frankfurt a.M.	3.568,7 ha
Strasbourg	2.193,4 ha
Wiesbaden	1.641,4 ha
Aachen	1.355,6 ha
Stettin	1.057,0 ha
Mannheim	1.038,9 ha
Hanover	1.021,4 ha
Stuttgart	936,1 ha

Source: Calculated on the basis of Statistisches Jahrbuch Deutscher Städte, Jg. 19, pp. 452—455.

Especially in the regional centres woodlands were significant (cf. Table 58.).

Instead, the greatest ratio per capita of area classified as parkland occurred in administrative cities, especially in old residential cities where the parks and gardens of the palaces of old ruling families had already added to the pleasant atmosphere.

Parks (excluding public woodlands) occurred mostly in the following cities:

Table 58.

Public woodlands and parks inside the city boundaries, m² per inhabitant in 1910 in German cities according to the applied classification, bracketed cases without public woodlands.

	Commer- cial Cities	Adminis- trative Cities	Metal Industry Cities	Textile Industry Cities	Garrison Cities	Regional Centres	On Average	Tail prob- ability	(N)
Public woodlands and parks, squaremeter per inhabitant	1910 19.3 (3.5)	28.4 (7.5)	19.3 (5.3)	32.8 (4.1)	4.9 (3.0)	42.9 (6.3)	27.2 (5.4)	0.050 0.208	(44) (44)

Sources: Calculated on the basis of Statistisches Jahrbuch Deutscher Städte, Jg. 19, pp. 452—455.

Applied classification:

Commercial Cities: Altona, Bremen, Cologne, Frankfurt a.M., Hamburg, Leipzig, Lübeck

Administrative Cities: Berlin, Brunswick, Breslau, Cassel, Dresden, Hanover, Karlsruhe, Königsberg, Magdeburg, Munich, Strasbourg, Stuttgart

Metal Industry and Mining Cities: Chemnitz, Dortmund, Düsseldorf, Essen, Mannheim, Nuremberg

Textile Industry Cities: Aachen, Augsburg, Barmen, Crefeld, Elberfeld, Mulhouse

Garrison Cities: Kiel, Mainz, Metz, Potsdam

Regional Centres: Danzig, Erfurt, Frankfurt a.O., Görlitz, Halle, Posen, Stettin, Wiesbaden, Würzburg

Table 59.

Park area (m² per inhabitant) in certain German cities in 1910.

City	According to calculations based on Stat. Jb. Deutscher Städte	According to survey from Zentralstelle für Volkswohlfahrt
Magdeburg	22.0	12.4
Würzburg	20.2	..
Cassel	14.3	17.7
Mannheim	12.4	12.1
Munich	11.8	6.1
Görlitz	10.7	..
Hanover	8.2	7.4
Aachen	8.2	3.9
Bremen	7.8	..
Karlsruhe	7.1	3.4
Crefeld	6.3	6.3
Halle	6.3	4.6
Chemnitz	5.9	6.2

Sources: Calculated on the basis of Statistisches Jahrbuch Deutscher Städte, Jg. 19, pp. 452—455; Familiengärten und andere Kleingartenbestrebungen in ihrer Bedeutung für Stadt und Land. Vorbericht und Verhandlungen der 6. Konferenz der Zentralstelle für Volkswohlfahrt in Danzig am 18. Juni 1912. Schriften der Zentralstelle für Volkswohlfahrt, H. 8 der Neuen Folge (der Schriften der Zentralstelle für Arbeiter-Wohlfahrtseinrichtungen), Berlin 1913, pp. 44—47, 50—53.

The big cities were not able to compete with small towns (less than 100,000 inhabitants). The ratio of parkland per inhabitant was less in cities with a population of over 100,000 inhabitants (see table 60.).

The different criteria of classification make it difficult to compare parks between the German and British cities. In the British municipal statistics these include different playgrounds, grounds, pitches, courts, lawns etc., even cemeteries are included. On the other hand it was not the custom in Germany to build playing grounds in parks but apart from them and they were registered separately in the statistics. Partly because of classification criteria the British cities appear to have been

Table 60.

Public woodlands and parks inside the city boundaries (m² per inhabitant) in different German cities of various size in 1910.

Size (inhabitants)	Parks with public woodlands	Parks without public woodlands
50,000—100,000	18.1	6.8
100,000—200,000	41.5	5.1
200,000—1,000,000	18.9	5.4
Berlin	2.5	2.5
Average	27.2	5.4

Source: Calculated on the basis of Statistisches Jahrbuch Deutscher Städte, Jg. 19, pp. 452—455.

ahead of the German cities and towns in this respect and provided models for them.⁵⁵ In 1915 Martin Wagner presented the following comparison⁵⁶ between German and British cities in this respect:

55. Cf. Comparative Municipal Statistics, Vol. I 1912—1913, pp. 48—49; J. Kaup, Vorbericht, Familiengärten und andere Kleingartenbestrebungen in ihrer Bedeutung für Stadt und Land. Vorbericht und Verhandlungen der 6. Konferenz der Zentralstelle für Volkswohlfahrt in Danzig am 18. Juni 1912, in: Schriften der Zentralstelle für Volkswohlfahrt. Heft 8 (der neuen Folge der Schriften der Zentralstelle für Arbeiter-Wohlfahrtseinrichtungen), Berlin 1913, p. 12.
56. Martin Wagner, Städtische Freiflächenpolitik. Grundsätze und Richtlinien für Grösse und Verteilung der verschiedenen Arten von sanitärem Grün im Stadtplane mit besonderer Berücksichtigung von Gross Berlin, in: Schriften der Zentralstelle für Volkswohlfahrt. Heft 11 (der neuen Folge der Schriften der Zentralstelle für Arbeiter-Wohlfahrtseinrichtungen), Berlin 1915. According to Peter Breitling 1915 when Wagner's book was published was a decisive year in the history of municipal policies regarding parks and recreation areas. Peter Breitling, Fragen zur Geschichte der städtischen Grünflächenpolitik, in: Städtisches Grün in Geschichte und Gegenwart. Veröffentlichungen der Akademie für Raumforschung und Landesplanung, Forschungs- und Sitzungsberichte, Bd. 101, Hanover 1975, pp. 25—40, especially p. 27; For a concise account of the views of various groups in discussion on parks and recreation areas and the terminology used, see Dieter Hennebo, Stadtgrün und Funktionsvorstellungen im 19. und am Beginn des 20. Jahrhunderts, in: Städtisches Grün in Geschichte und Gegenwart. Veröffentlichungen der Akademie für Raumforschung und Landesplanung, Forschungs- und Sitzungsberichte, Bd. 101, Hanover 1975, pp. 41—48.

Table 61.

Area of parks and playgrounds etc. (m² per inhabitant) in certain British (in 1902) and German cities (in 1910).

Size of City (inhabitants)	Britain 1902		Germany 1910	
	Number of cities	parks, playgrounds	Number of cities	parks, playgrounds etc. per inhabitant (m ²)
500,000—	5	6.1	6	2.0
400—500,000	1	7.0	1	3.0
300—400,000	5	9.1	4	3.8
200—300,000	6	3.6	11	4.3
100—200,000	10	5.3	24	2.9

Sources: Wagner, Martin, *Städtische Freiflächenpolitik. Grundsätze und Richtlinien für Grösse und Verteilung der verschiedenen Arten von sanitärem Grün im Stadtplane mit besonderer Berücksichtigung von Gross Berlin*. Schriften der Zentralstelle für Volkswohlfahrt, Heft 11 (der neuen Folge der Schriften der Zentralstelle für Arbeiter-Wohlfahrtseinrichtungen), Berlin 1915, p. 34.

The British cities were closer to Wagner's ideal area of 20 m² per inhabitant. The above table deals with German industrial cities the growth rate of which was very rapid and most of which are not included in our study (Charlottenburg, Duisburg, Neukölln, Berlin-Schöneberg, Berlin-Wilmersdorf, Bochum, Gelsenkirchen, Mülheim a. Ruhr, Plauen and Saarbrücken).

An example of the dependence of park area on the growth rate of cities can be presented from British cities. The negative correlation -0.46 of the speed of growth with area of public parks and open spaces per inhabitant occurred among 13 British cities and towns in 1912.⁵⁷

From Table 62. it can be concluded that many towns and cities in the United Kingdom had already reached the stage of slackening growth at the end of the research period so that they could invest to leisure time services and environment.

As far as the individual British towns were concerned the high ratio in Newcastle is explained mainly by the geographical location of the town whereas Edinburgh and

57. Calculated on the basis of *Comparative Municipal Statistics*, Vol. I 1912—1913, pp. 48—49 and Appendix V.

Table 62.
Parks and open spaces in certain British cities and towns in 1883, 1902 and 1912.

City	Year	Number of inhabitants	Number of open spaces	Area in hectares	m ² per person	per-centage of total area	City	Year	Number of inhabitants	Number of open spaces	Area in hectares	m ² per person	per-centage of total area
London	1883	3,834,000	103	1,612.8	4.2	..	Newcastle	1883	145,200	7	51.2	3.5	..
	1902	4,536,000	313	2,412.8	5.3	..		1902	214,900	11	95.2	4.4	..
	1912	4,521,685	..	2,712.3	6.0	9.0		1912	286,603	..	569.4	21.4	16.6
Birmingham	1883	400,000	10	98.8	2.4	..	Cardiff	1912	182,259	..	78.1	4.3	3.0
	1902	522,000	18	153.2	2.9	..		1912	114,663	..	62.7	5.5	3.0
	1912	840,202	..	345.2	4.1	2.0		1883	512,000	5	154.0	3.0	..
Liverpool	1883	552,400	10	229.2	4.1	..	Glasgow	1902	760,500	41	419.2	5.5	..
	1902	686,300	41	305.2	4.4	..		1912	784,496	..	522.9	6.7	10.2
	1912	746,421	..	517.2	6.9	7.7	Edinburgh	1883	229,000	17	327.6	14.3	..
Manchester	1883	341,000	7	51.2	1.5	..		1902	316,500	24	518.4	16.3	..
	1902	543,000	37	395.7	7.2	..		1912	320,318	..	567.4	17.7	12.9
	1912	714,333	..	516.4	7.2	5.9	Dundee	1912	165,004	..	213.3	12.9	10.9
Sheffield	1883	284,400	5	30.0	1.0	..		1883	105,000	3	24.0	2.3	..
	1902	380,800	15	132.0	3.4	..		1902	153,100	3	29.2	1.9	..
	1912	459,916	..	245.3	5.3	2.5	Belfast	1883	207,800	2	57.6	2.8	..
Leeds	1883	309,000	6	199.6	6.4	..		1902	349,000	7	104.4	3.0	..
	1902	429,000	20	298.4	7.0	..		1883	348,500	4	870.0	25.0	..
	1912	445,550	..	491.3	11.0	5.6	Dublin	1902	373,100	14	574.0	15.4	..
Bristol	1883	206,900	6	196.0	9.4	..							
	1902	329,000	21	270.8	8.2	..							
	1912	357,048	..	324.2	9.1	4.6							

Sources: Calculated on the basis of Schriften der Zentralstelle für Volkswohlfahrt. Heft 8 (der neuen Folge der Schriften der Zentralstelle für Arbeiter-Wohlfahrts-einrichtungen) Familie und andere Kleingartenbestrebungen in ihrer Bedeutung für Stadt und Land. Vorbericht und Verhandlungen der 6. Konferenz der Zentralstelle für Volkswohlfahrt in Danzig am 18. Juni 1912, Berlin 1913, pp. IV—II; Comparative Municipal Statistics, ed. London County Council, Vol. 1, London 1915, pp. 1—2, 48—49.



Figure 24.

The school gardens were a useful method of teaching children the importance of labour and the love of nature. School gardens in Breslau. (Familiengärten und andere Kleingartenbestrebungen in ihrer Bedeutung für Stadt und Land. Vorbericht und Verhandlungen der 6. Konferenz der Zentralstelle für Volkswohlfahrt in Danzig am 18. Juni 1912. Schriften der Zentralstelle für Volkswohlfahrt, Heft 8, Berlin 1913)

London, for example, had a high proportion of royal parks. However, in 1912 some industrial cities also had a relatively high ratio of parkland: Liverpool 7.7 per cent, Manchester 5.9 per cent and Leeds 5.6 per cent (see Table 62.).

During the period studied there was a continuous debate on the aesthetic and social importance of parks, playgrounds, gardens, allotment gardens and avenues. The debate also concerned home gardens and school gardens. Their aesthetic and social significance was assumed and it was believed that they could help to prevent the degeneration and delinquency of youth.⁵⁸

Parks, gardens, and outdoor activities, all contributed first and foremost to the maintenance of the human being's

58. Wagner 1915, pp. 1—12, 22; Hans Riehl, *Land und Leute*, 21. Auflage, Berlin 1907.



Figure 25.
School gardens in Helsinki in the 1910s. (Photo: Eric Sundström,
Collections of the Helsinki City Museum)

relationship with nature, which again was considered vital for his well being. As the Medical Officer of Health for Glasgow stated in 1896:

"Every public park, and the flowers and music which attract people thither, every open space and children's playground, every cricket and football field, every gymnasium and drillground is a precaution against Consumption."⁵⁹

Discussions in Germany also stressed the importance of gardens and family plots for the recreation and communality of families. Also the positive effects of fresh air and sports grounds were stressed. The need for recreation areas and playgrounds was estimated to be greater in densely built areas

59. T. C. Smout, *A Century of the Scottish People 1830—1950*, London 1986, p. 121.

than in the villa areas. With reference to American examples it was believed that crime and especially juvenile delinquency would decrease in areas with parks, playgrounds etc.

One of the aims of family, allotment and schoolchildren's gardens was to provide varied nutrition. The school gardens were mainly designed as an aid to the teaching of botany. However, in connection with the schools there were also so-called "Working gardens" (*Arbeitsgärten*) which facilitated the teaching of gardening tasks and methods. In most of the cities referred to in this study there were school gardens.⁶⁰

In the early 1910s various estimates were presented concerning the need for parks and green areas. Oberbaurat J. Stübben and J. Brix wrote an article for *Handbuch der Hygiene* in which they presented the requirement of 2 m² of parks and 2 m² of planted areas in connection with streets and squares per inhabitant. H. Franke proposed that 3 m² of park area should be reserved per inhabitant and 1,000 m² of playgrounds per 1,000 children of the appropriate age. The prize-winning project for the city plan for Greater Düsseldorf proposed that the area to be reserved for parks, playgrounds etc. should be twice that reserved for construction. Thus, 6,000 ha of built-up area would require 12,000 ha of parks.⁶¹

According to *Deutsche Viertelsjahrschrift für öffentliche Gesundheitspflege* the following requirements for park areas and gardens in relation to population density were presented:⁶²

Density of population	Parks, allotment gardens etc. m ² /inhabitant
—300 inhabitants/ha	5
300—400	10
400—450	15
450—500	20
500—700	25
700—	30

60. O. Michaelke, Schulgärten und Gartenarbeit für Kinder, in: *Schriften der Zentralstelle für Volkswohlfahrt*. Heft 8, Berlin 1913, pp. 264—265.

61. Quoted in Kaup 1913, pp. 12—14.

62. Kaup 1913, p. 14.

With respect to the placing and zoning of park areas, playgrounds etc. Wagner states that the first systematic attempts to place park areas in city and town plans arose in the policies of American planning authorities.⁶³

Plans for the prevention of over-population and the depopulation of rural areas included garden cities. The aim was to establish new towns in rural areas by placing industry in the countryside and at the same time establish garden towns and villages for the workers. Prototypes in this respect were the industrial village-type communities of Port Sunlight, Bournville and Carswick established by the Garden City Association in England. A similar association was also founded in Germany in 1902. At first the association followed a propagandistic course. It was with great efforts that a few garden cities were established around 1910. The garden city of Hellerau is an example of the de-centralization of industry. In addition there were garden city suburbs in the following cities: Cologne, Danzig-Neuschottland, Darmstadt "Hohler Weg", Frankfurt a.M., Munich-Perlach, Marienberg, Nuremberg, Rostock and Ulm.⁶⁴

In comparison to the cities of Germany and Great Britain the Finnish cities had relatively large areas of parks, lanes and walks per inhabitant. In most of the Finnish cities and towns the area per inhabitant exceeded 10 m². This was partly a result of the extent of land owned by the cities. In 1900 the city of Helsinki owned 1,798 hectares of land and in the city there were 115 hectares (12 m²/inhabitant) of parks and walks according to the official statistics.⁶⁵

Other personal services

With the increase in population the large cities saw an increase in private services, for example *restaurant and catering*

63. Ibid., pp. 21—22.

64. Ibid., pp. 36—42.

65. Eino Kuusi's analysis in the Finnish edition of Damaschke, Damaschke 1908, pp. 215—216.

services. They can be measured by the contents of the licence applications. Restaurant services were available in nearly the same ratio in cities of different types. They were more common in the old Hanseatic and other commercial cities. At the top of the league of fully or partially licensed catering establishments per 10,000 inhabitants in 1898 were:⁶⁶

Mainz	7.3
Bremen	6.8
Stettin	6.8
Mannheim	6.0
Nuremberg	5.8
Berlin	5.7
Königsberg	5.6
Hamburg	5.5
Frankfurt a.M.	5.5
Danzig	5.4

and at the bottom of the league were metal industry cities — especially from the Ruhr area

Essen	1.8
Brunswick	2.0
Kiel	2.1
Düsseldorf	2.3
Chemnitz	2.6
Dortmund	2.7

In comparing the situation with the data for 1911 it can be seen, that the relative number of restaurants decreased somewhat in comparison with the year 1898. For example, in 1898 the average number of restaurants in Mainz per 10,000 inhabitants was 7.8 which decreased relatively to 6.3 restaurants per 10,000 inhabitants by 1911. This may have

66. Gast- und Schankwirtschaften: Gastwirtschaften mit voller Schankkonzession, Gastwirtschaften mit Ausschluss des Schankbetriebes, Schankwirtschaften unbeschränkt, Schankwirtschaften beschränkt, ohne Branntweinausschuss, Kleinhandlungen mit Branntwein, Stat, Jb. Deutscher Städte, Jg. 8, pp. 362—363; Jg. 19, pp. 218—221.

partly due to the temperance movement of the time. Differences in the above respect were also due to varying state policies.⁶⁷

In addition to restaurant and catering services the other mainly private personal services dealt within this study are the *hairdressing, laundry services*. These can be explored by observing the proportion of all employed people occupied in these services in different types of cities in the cross-sectional years 1895 and 1907.

The main result from the distribution of the proportion of people working in personal services was that there are not great differences between various groups of cities. The only group which differed remarkable from other cities in that respect, was the group of the metal and textile cities (see Table 63.) especially in the Ruhr area (see Table 64.).

This comes clear out also when applying *regression analysis* to investigating factors explaining the proportion of people working in personal services (hairdressing, laundry services etc) in relation to total employment in 1907 in different types of cities. A good standard of services was reached in cities where the proportion of civil servants and people in liberal professions and tradesmen was high; $R^2 = .51$ (see Appendix IX, model 10).

An even better statistical result was obtained by a regression model where in addition to the above the variables of location in Southern or South-Western Germany and classification as a metal or textile industry city are included. The latter variables had a negative effect. In this case the degree of explanation is .71 (see Appendix IX, model 11).

As a last word on the leisure time services provided by the German cities one can say that the supply in this sector did not adapt itself quickly enough to a fast rate of growth without some special measures being taken.

The administrative and commercial cities were in a stronger position when the existence of a potential demand was vital, e.g. theatres, music and restaurant services.

So far as the library services and parks were concerned the emerging trend is an interesting one. The cities in England, Scotland and Wales invested in library and reading room

67. Stat. Jb. Deutscher Städte, Jg. 19, pp. 213—242.

Table 63.

Proportion of persons working in personal services (hairdressing, laundry services etc.) from total employment in German cities according to the applied classification in 1895 and 1907.

Proportion of persons working in personal services from total employment		Commer- cial Cities		Adminis- trative Cities		Metal Industry Cities		Textile Industry Cities		Garrison Cities		Regional Centres		On Average		Tail prob- ability		(N)
		1895	1907	2.1	2.1	1.5	1.4	1.4	1.5	1.9	1.8	2.1	2.0	1.9	1.9	0.0004	0.0000	
				2.1	2.1	1.5	1.4	1.4	1.5	1.9	1.8	2.1	2.0	1.9	1.9	0.0004	0.0000	(44)
				2.0	2.1	1.4												(44)

Sources: Calculated on the basis of Statistik des Deutschen Reichs, Neue Folge, Band 107. Berufs- und Gewerbebe-
zählung vom 14. Juni 1895. Berufsstatistik der deutschen Großstädte. Erster Theil, bearbeitet im Kaiserlichen
Statistischen Amt, Berlin 1897; Statistik des Deutschen Reichs, Neue Folge, Band 109. Berufs- und
Gewerbebe-
zählung vom 14. Juni 1895. Berufsstatistik der kleineren Verwaltungsbezirke, bearbeitet im
Kaiserlichen Statistischen Amt, Berlin 1897; Statistisches Jahrbuch Deutscher Städte, Jg. 6, p. 352; Beiträge zur
Statistik des Großherzogthums Hessen, Bd. 48, pp. 237—381; Beiträge zur Statistik des Großherzogthums Baden,
Neue Folge, H. 9. Die Berufsbe-
zählung vom 14. Juni 1895, Karlsruhe 1895, pp. 246—257.
Statistik des Deutschen Reichs, Neue Folge, Band 207, Abteilung VI. Großstädte, Berufs- und Betriebsbe-
zählung vom 12. Juni 1907; Statistik des Deutschen Reichs, Neue Folge, Band 209, Berufs- und Gewerbebe-
zählung vom 12.
Juni 1907. Berufsstatistik. Abteilung VIII. Kleinere Verwaltungsbezirke, bearbeitet im Kaiserlichen Statistischen
Amt, Berlin 1910; Statistik des Deutschen Reichs, Neue Folge, Band 211, Berufsstatistische Abteilung X. Die
berufliche und soziale Gliederung des deutschen Volkes, Berlin 1913; Beiträge zur Statistik des Großherzogthums
Hessen, Band 60, Heft 1, Darmstadt 1910.

Applied classification:

Commercial Cities: Altona, Bremen, Cologne, Cologne, Frankfurt a.M., Hamburg, Leipzig, Lübeck

Administrative Cities: Berlin, Brunswick, Breslau, Cassel, Dresden, Hanover, Karlsruhe, Königsberg, Magdeburg,
Munich, Strassbourg, Stuttgart

Metal Industry and Mining Cities: Chemnitz, Dortmund, Düsseldorf, Essen, Mannheim, Nuremberg

Textile Industry Cities: Aachen, Augsburg, Barmen, Crefeld, Elberfeld, Mulhouse

Garrison Cities: Kiel, Mainz, Metz, Potsdam

Regional Centres: Danzig, Erfurt, Frankfurt a.O., Görlitz, Halle, Posen, Stettin, Wiesbaden, Würzburg

Table 64.

Proportion of persons working in personal services (hairdressing, laundry services etc.) from total employment in German cities grouped according to geographical location in 1895 and 1907.

	In the Ruhr area	In Southern and South- Western Germany	In North- Western Germany	In Central Germany	In Eastern Germany	On Average	Tail probability	(N)
Proportion of persons working in personal services from total employment	1895 1.4 1907 1.4	2.1 2.1	2.1 2.1	1.9 1.8	2.0 1.9	1.9 1.9	0.0001 0.0000	(44) (44)

Sources: Calculated on the basis of Statistik des Deutschen Reichs, Neue Folge, Band 107. Berufs- und Gewerbezahlung vom 14. Juni 1895. Berufstatistik der deutschen Großstädte. Erster Theil, bearbeitet im Kaiserlichen Statistischen Amt, Berlin 1897; Statistik des Deutschen Reichs, Neue Folge, Band 109. Berufs- und Gewerbezahlung vom 14. Juni 1895. Berufstatistik der kleineren Verwaltungsbezirke, bearbeitet im Kaiserlichen Statistischen Amt, Berlin 1897; Statistisches Jahrbuch Deutscher Städte, Jg. 6, p. 352; Beiträge zur Statistik des Großherzogtums Hessen, Bd. 48, pp. 237—381; Beiträge zur Statistik des Großherzogtums Baden, Neue Folge, H. 9. Die Berufszählung vom 14. Juni 1895, Karlsruhe 1895, pp. 246—257. Statistik des Deutschen Reichs, Neue Folge, Band 207, Abteilung VI, Großstädte, Berufs- und Betriebszahlung vom 12. Juni 1907; Statistik des Deutschen Reichs, Neue Folge, Band 209. Berufs- und Gewerbezahlung vom 12. Juni 1907. Berufstatistik. Abteilung VIII. Kleinere Verwaltungsbezirke, bearbeitet im Kaiserlichen Statistischen Amt, Berlin 1910; Statistik des Deutschen Reichs, Neue Folge, Band 211, Berufsstatistische Abteilung X. Die berufliche und soziale Gliederung des deutschen Volkes, Berlin 1913; Beiträge zur Statistik des Großherzogtums Hessen, Band 60, Heft 1, Darmstadt 1910.

Geographical location of the city:

In the Ruhr area: Aachen, Barmen, Cologne, Crefeld, Dortmund, Düsseldorf, Elberfeld, Essen

In Southern and South-Western Germany: Augsburg, Frankfurt a.M., Karlsruhe, Mainz, Mannheim, Metz, Mulhouse, Munich, Nuremberg, Strasbourg, Stuttgart, Wiesbaden, Würzburg

In North-Western Germany: Altona, Brunswick, Bremen, Cassel, Hamburg, Hanover, Kiel, Lübeck

In Central Germany: Berlin, Chemnitz, Dresden, Erfurt, Halle, Leipzig, Magdeburg, Potsdam

In Eastern Germany: Breslau, Danzig, Frankfurt a.O., Görlitz, Königsberg, Posen, Stettin

services more than did the Germans whereas the latter were actively involved in developing theatre and other leisure time services. One reason for this trend can be found in the different practice of taxation.

This may well indicate that when the growth of the city was slowing down it felt able to invest more in leisure time activities. German examples of cities at the stage of slackening growth include the old textile centres Aachen and Elberfeld both of which were very active in the matter of theatres and baths.⁶⁸

68. Reulecke 1985, p. 65; Dawson 1914, p. 313.

14. The Diffusion of Innovations: Summary

In the latter half of the 19th century towns and cities provided frames of reference for each other both on the national and the international levels. Research so far has paid very little attention to this. Similarly research and study of the development of service institutions as a result of international connections across national boundaries have not been extensive. The concept of *frame of reference* implies the possibility of making comparisons. In the late 19th century the production of information on towns and cities increased as the result of official statistics, studytours, personal contacts, town and city meetings and exhibitions. The possibility of making comparisons became available to an increasingly large number of bodies. The group or frame for comparison was not necessarily to be found in one's own country but had to be sought abroad. Towns and cities formed networks of contact across national boundaries and innovations followed many different routes.

The transmission of innovations was closely linked to the spread of knowledge. Knowledge of innovations, for example new technology or methods, could arrive through several different channels and from several different sources. As mentioned in chapter 2. the following channels of diffusion are considered to be the most important ones with reference to the receiving town or country:¹

Research papers, literature and journals, statistics;
International congresses and exhibitions;
Study abroad, personal contacts.

1. Hietala 1983, p. 27.

On the international level frames of reference can be easily studied. For instance minutes of city council meetings can provide information on the city or locality referred to in connection with reforms. These sources may also reveal the model city or country that had been discussed in connection with those reforms. The memoirs and reports of decision-makers can give support for conclusions regarding their relationship with the outside world or with other towns and cities on a national or international level.

International contacts can also be studied on the macro level through the spread of literature and the information provided by comparative studies of different towns and cities. For example Adna Ferrin Weber's work on the growth of cities from 1899 provides an exceptionally broad comparison of the demographic structure of cities.² Around the turn of the century the book series *Gemeindebetriebe*, published in the *Verein für Socialpolitik* series contained, on a broad scale, information on municipal enterprises in German towns as well as the achievements of English, Italian, Austrian, French, Hungarian, Belgian, Swiss and New Zealand towns.³ The wide readership of this series of books is attested by many surveys published in the early 1910's. These include William Harbutt Dawson's book,⁴ discussed above, and Douglas Knoop's book.⁵ Comparative studies were made possible by the statistical offices and bureaux of the cities, which were established in the late 19th century. They made the production of information more effective with respect to comparative studies. Reviews and surveys of conditions in other countries and cities were part of the programme of the statistical offices of the large cities, e.g. London's Statistics.

2. Adna Ferrin Weber, *The Growth of Cities in the Nineteenth Century. A Study in Statistics*, New York 1899.

3. *Gemeindebetriebe*. *Schriften des Vereins für Socialpolitik*, see chapter 5, footnote 1.

4. William Harbutt Dawson, *Municipal Life and Government in Germany*, London 1914.

5. Douglas Knoop, *Principles and Methods of Municipal Trading*, London 1912.

Use of statistics

From the latter half of the 19th century onwards it became easier for decision-makers to compare their own country and their own town with other similar places due to the existence of data available for comparison. International congresses on statistics were in particular engaged in creating standards and putting statistical practices into effect. The choice of the sectors of society providing statistics and the nature of the data were by no means random. Statistics, in the manner of all other historical source material, are also indications of the system of values and informational needs of the period concerned. The International Statistical Institute (Institut International de Statistique) was founded in 1885. Its predecessors were the International Statistical Congresses held from 1853 to 1878. These congresses met on nine occasions and such International Statistical Congresses and international co-operation in this field had arisen already in connection with the Crystal Palace exhibition of 1851, at which time statistical bureaux and central offices of information had been established in an increasing number of countries.⁶ The Central Statistical Office of Finland was founded 1865. At the International Statistical Congresses (the first one was held in Brussels in 1853) the participants agreed upon common methods and practices and views were exchanged between officials in the field. August Hjelt, chief of the Central Statistical Office of Finland made the personal acquaintance of such internationally renowned statisticians as Georg von Mayr from Berlin and von Inama-Sternegg from Vienna, when he visited the statistical offices of the central European states and spent two months seeking for new information about statistics.⁷

Congresses were successful on the political level as long as only recommendations were given. However, when the Paris congress of 1878 ruled that the recommendations were also

6. J. W. Nixon, *A History of the International Statistical Institute, 1885—1960*, Hague 1960.

7. August Hjelt, *Den VIII internationella kongressen för hygien och demografi i Budapest 1894*. (Papers of August Hjelt. Special Collections, Archives of Central Statistical Office, Helsinki).

binding for the participating countries, the congresses came to an end, though this was also due partly to the Franco-Prussian quarrel.⁸

The work was carried on by the International Statistical Institute, founded by Léon Say and F. X. von Neumann-Spallart, who proposed its foundation in an address on the 50th anniversary of the Statistical Society in London. The institute was of a purely scientific nature and its purpose was to promote the comparability of statistics. At first the maximum number of members was 150, which was raised later to 200. The institute had its own sections for demographic and economic statistics as well as judicial and administrative statistics. It was also in these fields that the towns and cities began their work of putting into effect the collection of statistics following the founding of the relevant local offices.⁹

The series of the institute, the *Bulletin de l'Institut International de Statistique*, presented the papers and minutes of its meetings. Before the First World War meetings were held every other year from 1887 onwards. In 1913 the permanent office of the institute was established (*Office Permanent de l'Institut International de Statistique*).

The idea of a statistical series relating to the large cities was suggested as early as 1855 at the statistical congress of Paris in a motion proposed by Ch. Dupin. The scheme was further developed by the Italian Correnti but it was not until the St. Petersburg congress in 1872 that the notion of a series of statistics on the large cities was followed up. The Austrians, headed by Körösi, stressed the idea the next year in Vienna and finally in 1876 the Budapest congress had its own section dealing with the statistics of large cities. In Budapest it was decided to start with the financial statistics of the cities and the monitoring of changes in population on the basis of weekly bulletins. Körösi himself put the plan into action by publishing his own studies of sources with funding from the city of Budapest. The meeting of the International Institute of Statistics held in Paris in 1889 decided to go publishing the bulletin. However, the international statistics on mortality

8. Nixon 1960, pp. 8—10.

9. Friedrich Zahn, *Statistik (Internationale)*, *Handwörterbuch der Staatswissenschaften*, Bd. VII, 3. Aufl, Jena 1911, pp. 885—893.

were to be published by Bertillon in Paris and the statistics on birth and marriages by Körösi in Budapest.¹⁰

As discussed above, international contacts in the field were instrumental in developing statistical methods and practices. The leading authorities formed relationships for exchanging information which ensured that new methods and information spread to even the most remote countries participating in the congresses. The development of statistics augmented many of the channels for the spread of innovations ranging from personal contacts to attendance at congresses.

Exhibitions

At the macro or international level contacts by way of the world exhibitions have received the most attention. The most interesting stimulus for developing urban technology in cities came from the Crystal Palace exhibition. This exhibition has been regarded as a milestone marking the end of the heyday of English industrialization, after which the so-called industrial spirit clearly declined.¹¹ On the other hand scholars, W. O. Henderson among others, have in their analyses of the roots of German industrialization regarded the Crystal Palace exhibition as a starting point. The industrialization process in Germany is seen to have this exhibition as one of its cornerstones, where the German visitors could see for the first time how much more advanced the English were.¹² It is claimed that this marked the beginning of competition, from which time the Germans advanced at a very rapid pace.

In his work on English culture and the decline of the industrial spirit 1850—1980, Martin J. Wiener claims that

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10. Wilhelm Morgenroth, *Die städtischen statistischen Ämter*, Handwörterbuch der Staatswissenschaften, Bd. VII, 4. Auflage, Jena 1926, pp. 942—971; About effects of municipal statistics see: L. Schücking (früher Bürgermeister der Stadt Husum), *Kommunalpolitik und Statistik*, *Städte-Zeitung* 13.5.1910, pp. 428—429.
 11. Martin J. Wiener, *English Culture and the Decline of the Industrial Spirit 1850—1980*, Harmondsworth 1985.
 12. W. O. Henderson, *The Rise of German Industrial Power 1834—1914*, Berkeley 1975, pp. 106—108.

entrepreneurship declined in England after the Crystal Palace exhibition due to changes in values. Idealizing rural conditions became important and perspectives were those of the past rather than the future. The educated classes generally held the leisured country gentleman as an ideal. Entrepreneurship did not find a ready place among the British upper classes. The decline of the motive of achievement was the main reason for England falling behind Germany in the race for development. A further reason lay, some claim, in the English school systems, which valued a classical education and the heritage of Antiquity. On the other hand, Germany invested a great deal in technical schooling and the way of thought of the natural sciences and even the schools dealing with modern subjects had the natural sciences on their curricula.¹³

On the macro level there has been much interest recently in English investment policies. For example, Sidney Pollard has shown that although British savings were on the same level as those of the Germans and the Americans (average 11–15 per cent) before The First World War, the British preferred to invest abroad in their colonies rather than in domestic industries and services.¹⁴

The progress of the Germans can clearly be seen in their ability to take up innovations rapidly and to develop new ones. The best examples can be seen in the development of municipal technology and various new municipal services (counselling of enterprises,¹⁵ school health care etc.). The activity of towns and cities in Germany can be compared to that of business enterprises.

German researchers have suggested the birth of the new bourgeoisie as one of the factors explaining German industrialization, subsequent urbanization and the beginning of the modern era. In the 19th century family pride came to be replaced by the pride of the bourgeoisie in their own town.¹⁶ This class identified itself with the affairs of the town. The best

13. Wiener 1985, pp. 40–51.

14. Sidney Pollard, *Capital Exports, 1870–1914*, *Economic History Review* 4/1985.

15. Dawson 1914, pp. 242, 310.

16. Reulecke 1985, pp. 118–126; Matzerath 1985, pp. 224–232.

indication of the existence and attendance of this new bourgeoisie can be found in the nature of the Burgomasters of the towns, who saw the promoting of the welfare of the town as a matter of personal honour. Recent studies have investigated the work of the Burgomasters in some depth. In the late 19th century their ability and talent in guiding the growth of the towns through planning were of considerable importance. It has been claimed that they did not break off relations with the old elite but continued to operate with them. The more the Burgomasters kept contact with either political or ideological groups, the better they could carry out their plans. For example, the successful merging of new areas with the town was highly important for urban growth and the planning of services. Effective municipal administration also required experts in numerous fields. A rational division of work, such as in Düsseldorf, guaranteed that the affairs of the city could be taken care of.

At the international level the world exhibitions organized in Paris signified a competition in which technology and industry played an important role. It has been said that the Paris exhibition gave the German cities the impetus to arrange their first joint exhibition in Dresden in 1903. The Dresden exhibition report, *Die Deutschen Städte*, was distributed in large printings around Europe.¹⁷ This provides an example of the international exchange of ideas and the spread of new innovations.

Scottish cities were in many respects on the same course of development as the German cities and the late 19th century the Scottish city of Glasgow also arranged large exhibitions. The first one was held as early as 1888 in Glasgow, which above all concentrated on the housing of the future. Later the exhibitions, held in Glasgow in 1901 and 1911, showed how progressive that city was, especially with respect to the electric tramways¹⁸, but such exhibitions were also a way of displaying civic pride.¹⁹

17. Die deutschen Städte geschildert nach den Ergebnissen der ersten deutschen Städteausstellung zu Dresden 1903, Robert Wuttke (ed.), Bd. I—II, Leipzig 1904, See Deutsche Städteausstellung, Gemeinde-Verwaltungsblatt 11.3.1901, p. 122, 11.10.1902, p. 508, 11.4.1903, p. 174.

18. Adams 1978, pp. 190, 192, 205.

19. Waller 1983, p. 314.

Of the early municipal exhibitions of the 1910's, the Berlin exhibition in 1910 itself may be mentioned. Here the aesthetic attractions and the image of the city were emphasised and discussion centred on the appeal of the city. Another significant exhibition was held in Düsseldorf in 1912.²⁰ It was also a congress on city problems. In addition to all these general exhibitions there were also several specialist exhibitions which spread information on new inventions and applied methods to experts from all over the world. As part of this series of international conferences on hygiene were organized from the late 19th century onwards (first in 1882 in Geneva). In 1911 an international hygiene exhibition was held in Dresden, where various means of raising the level of popular hygiene were presented. The exhibition had sections on science, history-ethnography and sports. Also various nations had their own sections, such as the Chinese, Japanese, Russian, French and Swiss. There were also departments on nursing, rescue work, military matters and colonies as well as personal hygiene and presenting foods and nutrients. A special sports laboratory was erected for friends of sport where the effects of sport on the human body were studied.²¹

The exhibitions were a time for taking stock and introspection. In the same way as the famous Crystal Palace exhibition of 1851 sowed the seeds of German industrialization, the Dresden hygiene exhibition in 1911 was not only a tribute to German science, but also a time of reflection and introspection. Although 40 cities in Germany had their own statistical offices and bureaux, they were not the pacemakers in the field of statistics. It was claimed that cities in England, Scandinavia and America produced statistics providing broader information than that produced in Germany. A reason for this was the fact that statistical offices in German cities did not have the so-called health sections or offices where professionals in the field of hygiene and demographers would prepare statistical data.²² This demonstrates the firm faith of

20. *Verhandlungen des ersten Kongresses für Städtewesen*, Düsseldorf 1912, Bd. 1—2, Düsseldorf 1912.

21. Erwin Nicolaus, *Zur Eröffnung der Internationalen Hygiene-Ausstellung Dresden* (6. Mai), *Städte-Zeitung* 2.5.1911, pp. 486—487.

22. *Die deutsche Städtestatistik auf der Internationalen Hygiene-Ausstellung zu Dresden*, *Städte-Zeitung*, 4.4.1911, pp. 409—410.

the period in information, statistics and research as well as providing evidence for the hypothesis that the statistical gathering of information and the presenting of comparative studies alone had certain effects on the improvement of certain institutions and services and on the desire to improve.

Exhibitions on city planning and construction form a separate grouping. There has been research to some degree on this theme, for example in Anthony Sutcliffe's works *Towards the Planned City* and *Pursuit of Urban History*.²³ City renewal exhibitions were especially numerous in the early 1900's. Examples include the Düsseldorf city exhibition of 1909 and the Berlin exhibition of construction held in 1910. These city exhibitions especially served the needs of the construction industry in particular. With the aid of photographs, maps and statistics, they showed the stage reached in the construction of large cities.²⁴

These exhibitions also presented the results of city planning competitions, such as the results of the planning of Greater Berlin. This shows how planning went much further than the design of housing and places of work. The organizers of the exhibitions wished to show how streets, squares, parks, railways and canals should be located in towns and cities. They also wished to show the results of the lack of planning especially on economic and hygienic development. The cities of Darmstadt, Düsseldorf, Duisburg, Dresden, Essen, Freiburg, Mainz, Munich, Stuttgart, Ulm, Vienna and Budapest were invited to participate in the exhibitions. From England the architect Raymond Unwin sent information on English town planning and valuable material from Boston was also requested.²⁵ The city of Helsinki also sent participants to the Berlin exhibition for town planning in 1910 as well as to the

23. Sutcliffe 1981, pp. 163—200.

24. Waitzmann, *Die Städtebau-Ausstellung in Düsseldorf*, *Städte-Zeitung* 30.9.1910, pp. 715—716; *Allgemeine Städtebauausstellung in Berlin*, *Gemeindeverwaltungsblatt* 22.2.1910, p. 112 and 22.3.1910, pp. 184—185 and 25.8.1910, p. 548; Alfred Moeglich, *Die Städtebau-Ausstellung zu Frankfurt a.M.*, *Städte-Zeitung* 24.5.1907, pp. 437—438.

25. Hans Dominik, *Die Allgemeine Städtebau-Ausstellung zu Berlin*, *Städte-Zeitung* 29.4.1910, pp. 389—393; Hans Dominik, *Die Allgemeine Städtebau-Ausstellung zu Berlin*, *Städte-Zeitung* 13.5.1910, pp. 417—420.

Royal Institute of British Architects Town Planning Conference in London in the same year.²⁶

Exhibitions on the anniversary dates of towns and cities were very common. One such was the Stockholm exhibition commemorating the 700th anniversary of the city in 1897 and similar commemorations were held in English towns and cities. These exhibitions placed great responsibility on the cities preparing to celebrate their anniversary year, because they had to present their city as progressive not only in relation to the past but in relation to other cities. In some cases the impetus for developing services came from exhibitions of this kind. At any rate, they were instrumental in stimulating the development of services and municipal work in general.

Exhibitions were especially numerous in the fields of technology and industry, the international industrial exhibition held in Turin in 1911 for example, and these were reported in trade journals for planners. They also touched on certain municipal services, institutions and public buildings and centred on the development of the large cities.²⁷

Hints of the mutual competition between German cities can be found in the journals and it became most obvious when the siting of some institutes or works was in contest. The *Städte-Zeitung* and the *Technisches Gemeindeblatt* and the Municipal Journal contained special columns presenting the latest ideas and innovations. The regular columns *Technische Nachrichten* in the *Städte-Zeitung* und *Technische Mitteilungen* in the *Technisches Gemeindeblatt* and London Weekly in the *Municipal Journal* were all useful for spreading news of innovations. Also the column *Winke für Industrie* in the *Städte-Zeitung*, for example, described the decisions made in different construction plans and the stages of planning of buildings. Information on the building of electricity and gas works as well as the construction of streets, water supply etc. was an essential component of these columns.²⁸

26. Helsingin kaupunginvaltuuston kokous 15.3.1910; Rahatoimikamarin kokous 7.4.1910. Kertomus Helsingin kaupungin kunnallishallinnosta 1910, Helsinki 1915, pp. 130—131; 238.

27. Internationale Industrie- und Gewerbeausstellung in Turin 1911, *Städte-Zeitung* 4.7.1911, pp. 668—670.

28. Kommunale Preisstreibereien, *Städte-Zeitung* 15.3.1907, pp. 313—314; Projekte und Neuanlagen, *Städte-Zeitung* 15.3.1907, p. 314.

The practice of publicizing the prizewinners of the city exhibitions by giving the name, area of business and location of the company in question may also have provided a special incentive.²⁹

Study tours: the work of the British Committee for the Study of Foreign Municipal Institutions

Significant channels for the spread of innovation were visits by the Mayors and Burgomasters of English and German cities in search of information. These contacts have been touched upon by Günter Hollenberg in his work *Englisches Interesse am Kaiserreich*³⁰ and Gerald Deckart in his book *Deutsch—Englische Verständigung*³¹. Hollenberg takes the political relations of Germany and England as his starting point studying how political development affected public opinion in England and Germany. Anglo-German co-operation on the municipal level is mainly limited to the period 1905—1914. This work, 'The Movement for Mutual Understanding', involved various spheres of society, including Burgomasters, Mayors and journalists. The Anglo-French policy of Entente gave special impetus to this movement for understanding. Germany had its own, mainly commercial interests in mind and progressive circles in Britain at least were interested in new ideas and especially the administration of German towns and cities.

The British were especially active in studying municipal activities. The British Committee for the Study of Foreign Municipal Institutions had Henry S. Lunn former missionary doctor, journalist, as secretary and Lord Lyveden as chairman.³² The committee made its first visit to Switzerland in 1904. The

29. Prämiierungen auf der Städte-Ausstellung in Dresden, Städte-Zeitung 21.10.1903, p. 34, 18.11.1903, p. 89, 2.12.1903, p. 116; Prämiierungen auf der Internationalen Hygiene-Ausstellung Dresden 1911, Städte-Zeitung 14.11.1911, pp. 123—124.

30. Hollenberg 1974, pp. 60—113.

31. Deckart 1967, pp. 61—70.

32. Henry S. Lunn, *The People, The Peers and the Budget*, Boston s.a., p. 3.

aim of the committee was to study institutions which were known to progressives in various countries. Consequently the committee planned study tours to the United States, the St. Louis world fair, Scandinavia and the towns and cities of Northern and Southern Germany.

Henry Lunn's report describes, visit by visit, the beneficial features of the country or city that could be applied under British conditions. The reports are of a very comparative nature and they clearly show what the British felt they could learn from the various countries concerned.³³

In Switzerland the first places to be visited were the electricity installations. A special subject of admiration in Switzerland was the practice of the municipal authorities in making as much profit as possible from gas, electricity and water and thus decreasing the need for funds that would have to be levied as taxes. According to Lunn this was the opposite of the English method of offering municipal services at prices which covered costs. Zürich, mentioned as the capital of German-speaking Switzerland, provided the visitors with the possibility of familiarizing themselves with the marvellous Polytechnic, "which is the pride of Switzerland and without a successful a rival in Europe". The professors led their guests through laboratories and lecture halls and the conclusion of Lunn was that Switzerland was rapidly taking first place in the sciences of technical engineering and especially electrical technology. In 20 years Switzerland had progressed from zero-level to the current situation. This progress was evidenced by the large Oerlikon engineering works, which should compete with the largest English and American firms.³⁴

The Swiss tour as well as the visit to America was led by Lord Lyveden, who was familiar with the situation in North America, having visited with some members to the two Houses of Parliament the large cities of Canada. The committee first visited Philadelphia and then Washington where they had a chance to meet President Roosevelt. Finally the delegates went to Saint Louis, which was visited again the following year for the world exhibition.³⁵

33. Henry S. Lunn, *Municipal Studies and International Friendship*, London and Aylesbury 1906.

34. Lunn 1906, pp. 1—6.

35. Lunn 1906, pp. 7—14.



Figure 26.

The English municipal experts were especially interested in the Nordic elementary school system of the municipalities. Schooling was obligatory and open to all. The photograph shows the Töölö elementary school in Helsinki in the early 1900s. (Collections of the Helsinki City Museum)

50 committee members visited the latter and on this occasion President Roosevelt met the delegates. In connection with both tours, the sources tell nothing of the nature of the effect of the cities of the United States nor of any innovations observed during the tour. It seems that both were mainly undertaken for public-relations purposes.³⁶

In the same year 1904 60 interested persons undertook a tour of Scandinavia in order to acquaint themselves with the situation in towns and cities there. The tour included Stockholm, Christiania (Oslo) and Copenhagen. In addition to Lord Lyveden the tour group included Sir Thomas Pile, ex-Lord Mayor of Dublin, Sir Joseph Sykes Rymer, ex-Lord Mayor of York and several persons of the Corporation of the City of London. The journey began on August 20, 1904 and the first

36. Lunn 1906, pp. 15—20.

stop was Christiania, where Andersen Aars, President of the Council, received the guests.³⁷

Significant observations were made of the Norwegian school system, including the elementary schools, where education from of 7 to 14 years was compulsory and already 81 % of all children were enrolled. The English observers were also impressed by the systems of meals in Norwegian schools which were offered free to those unable to pay. The showers and washing facilities were also a subject of interest. The tour also covered hospital facilities, especially the arrangements for isolating those suffering from contagious diseases.³⁸

On August 24th, the tour group arrived in Gothenburg, which had been the subject of admiring comment in the Municipal Journal among other publications. The guests had discussions with King Oscar, and some of the delegates were invited to Copenhagen as guests of Burgomaster Oldenburg. In Denmark, the English visitors studied the hospitals and poor houses. Health care in particular was greatly admired. Denmark was one of the first countries in the world to institute an old age pension system and to build homes for pensioners. The homes for the aged were operated in connection with the national old age pension system. According to Lunn only New Zealand had previously developed such a system. Upon retirement pensioners could remain in their own homes, if they so desired, but they could also move into special homes for the aged, where there were many comforts and even fountains. In Denmark the delegates were also shown the municipal school and fire brigade system which was of a very high standard.³⁹

On August 26th 1904 the delegates visited Stockholm. The city demonstrated its telephone hall with the largest number of exchanges in Europe (30,000 calls) as well as, again, the fire brigades and the school system. The gas and electricity works of Stockholm were also visited, and delegates who favoured municipal trading found much to support their aims. On September 3rd the delegates returned to Hamburg, where they were met by the Burgomaster, Monkeberg, and were shown in

37. Lunn 1906, pp. 21—22.

38. Thomas Pile on the Municipal Visit to Scandinavia (From the Daily News, September 7th 1904), in: Lunn 1906, pp. 28—30.

39. Lunn 1906, pp. 24—25.

particular the port and the department stores. The group finally returned to England on September 5th.

One of the participants, Anthony Pile, wrote of the trip to the Scandinavian cities in the *Daily News* (September 7th, 1904) commenting on the warm welcome accorded the guests. Commenting further on the lessons learnt in the cities visited, he wrote as follows:

"I was chiefly impressed by the superiority of the school and hospital systems over ours at home. In Norway and Sweden where the municipality manages the hospitals and schools this was particularly the case. The schools are notably free from our religious squabbles. One noticed that small classes, averaging twenty or twenty-five, seemed to be the rule. The cleanliness of the school and of all the scholars was very marked. That is easily understood when you find a plunge bath or shower bath in every school. Once a week at least, each child, no matter how clean or how dirty, must strip naked and take to the bath. Gymnastic training is as compulsory as bathing. Besides, every girl is made a good cook and needlewoman during her school days and every boy is taught a trade . . . At Christiania we were greatly impressed with the magnificence of the general hospital maintained by the municipality. Yet we were told the cost per day of each patient does not exceed ninepence. I will not attempt to explain how they do it. It is certainly not by stinting. We noticed in Copenhagen that the municipality makes a model hospital authority."⁴⁰

Immediately on their return from the Scandinavian tour the Committee decided to organize a tour of the German cities and towns. These trips were well prepared in advance with contacts at high state levels and they were hailed as expressions of peaceful co-operation. The delegation of British Lord Mayors visiting Germany in 1905 and 1907 as well as the delegation of German burgomasters visiting England in 1906 and 1908 were

40. Pile, in: Lunn 1906, pp. 29—30.

both received at the highest official level. In Berlin the Kaiser Wilhelm II held a reception in 1905 and in England King Edward VII held a corresponding reception at Buckingham Palace the following year. A special invitation was given to them to visit Windsor Castle, where they were entertained at luncheon by the King's command in the Waterloo Chamber. During the study tour to England the German Burgomasters (e.g. of Berlin, Cologne, Dresden, Aachen) and 50 Stadtrate visited municipal institutions in London.

Despite the cooling of political relations between England and Germany there were wide circles in both countries concerned with preserving amicable relations between the two nations. For these persons the visits at Lord Mayor and Burgomaster level were expressions of a desire for peaceful co-operation.⁴¹

The British especially praised Dr. von Meister's efforts in arranging the first tour of the English Lord Mayors. In May 1905, at a Court Ball in the Schloss at Berlin, Dr. Lunn and Lord Lyveden (the former Honorary Secretary of the British Committee for the Study of Foreign Municipal Institutions, the latter the Chairman of the Committee) had an interview with the German Emperor with reference to the first tour of the Committee, "which it was intended should be made to Northern Germany. The Kaiser said on that occasion that he felt greatly complimented by the suggestion that such an educational tour should be arranged to the cities of Germany, and that he would desire his Ministers to do all they could to make the visits to various cities a success." The British Ambassador in Berlin, Sir Frank Lascelles, was especially active in arranging the tour and it was agreed that it would include lodging-houses, municipal markets, hospitals, slaughterhouses, water, gas and electricityworks and trams.⁴²

The first expedition left England in June 1905, and in the interval Dr. von Meister — Under-Secretary for the Interior —

41. Lord Lyveden's Report on the Proposed journey to Berlin, Cologne, Aix-la-Chapelle, Brussels and Antwerp, in: Lunn 1906, pp. 3—7; Sir John Gorst (former conservative Minister of Education), Introduction, in: Henry S. Lunn, *Municipal Lessons from Southern Germany*, London 1908, pp. 1—3; See also Deckart 1967, p. 62.

42. Gorst, in: Lunn 1908, p. 2; Lunn 1906, pp. 31—46.

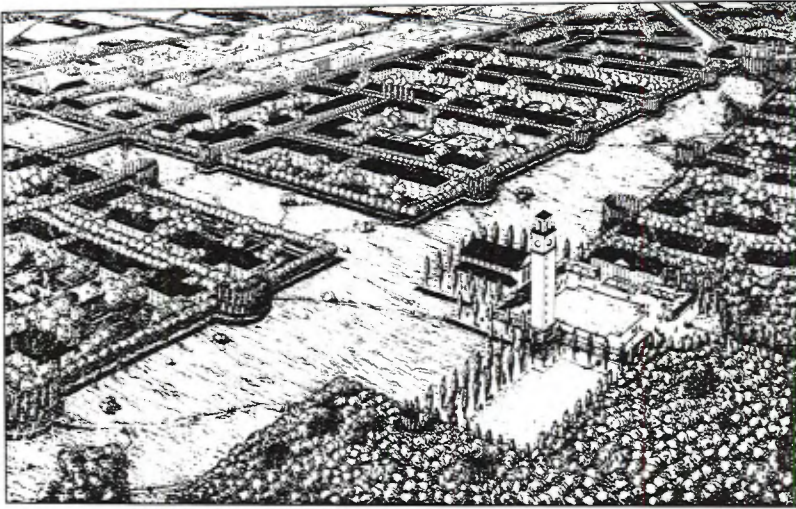


Figure 27.

Plan for a garden-city suburb of Berlin by the architects Martin Wagner and Rudolf Vondracek. (Martin Wagner, *Städtische Freiflächenpolitik. Grundsätze und Richtlinien für Grösse und Verteilung der verschiedenen Arten von sanitärem Grün im Stadtplane mit besonderer Berücksichtigung von Gross Berlin. Schriften der Zentralstelle für Volkswohlfahrt, Heft 11, Berlin 1915*)

had been twice to England to help make the necessary arrangements and had also visited different German cities to ensure a proper and hospitable reception. Von Meister had a wide knowledge of England and had been the guest of the London County Council in 1904.

The tour of the North German cities was preceded by a visit to Brussels and Antwerp from where the committee proceeded to Germany and the cities of Aachen, Cologne, Berlin and Dresden, all of which were anxious to show their guests the best they could offer.⁴³

In Berlin the well-equipped Moabite hospital was visited. It had an area of 17,000 m² of floor space and a total of 90,000 m² with gardens and recreational areas and many special features. There were sixteen administrative buildings and residences for

43. Lunn 1906, pp. 47—55.

doctors, nurses, etc. "The staff of the hospital, which is the most important in the German Empire, includes one president fully qualified in medicine and surgery. There are a first directing official, one directing official for the surgical department, one demonstrator, seventeen doctors, twenty dressers and three chemists. There is also a numerous staff and every six patients had a nurse or sister to take charge of them". There was also a nursing school at the hospital and a kindergarten school, one of the new ideas of the Berlin hospital. Here sick children received normal school teaching, and qualified teachers gave lessons twice a week to those children who were able to receive instruction.⁴⁴

The Berlin tour also included the municipal electricity works, the pumpstation, the fire brigade station, the Central market hall, municipal elementary schools and a children's asylum. The engineering school was presented as a subject of special interest and they also visited a slaughterhouse and the stockyards. On the last day of the visit the public baths were also visited.⁴⁵

At the time of this visit there were two exhibitions being held in Berlin, one on workmen's welfare and one the theme of Combating tubercular disease.

In the other German cities the visitors were shown various services, schools, hospitals and above all they were made familiar with the cities' administrative system and theatres.

Typically Burgomaster Feltmann of Aachen wished to present what was best in his city: firstly the administrative organization, secondly the school system, thirdly, construction work and the economy of the city. The relationship between industry and the municipality was particularly interested in Aachen. The English were also interested in the Imperial Gas Association and its relations with the municipality. The gas works were owned by the association and the trams were also owned by private companies. However, the city saw to it that it had shares in both firms. The Aachen officials told of the pressure of costs caused by the municipal schools of which

44. Lunn 1906, pp. 59—60.

45. Lunn 1906, pp. 56—59; The Berlin Rates on Landed Property in their connection with the Reform of Government Taxes enacted 1891—1893, Lunn 1906, pp. 95—143.

there were 41 with 419 teachers and 24,505 pupils. The English guests were also shown the cemeteries, the market squares, and bathing establishments.⁴⁶

It seems however that although the Germans were more progressive in respect of municipal institutions they still had much to learn from the British. In his speech of welcome Burgomaster Feltmann emphasized his view of the British as exemplary with respect to individual liberties.

In Cologne visits were made to the market hall, the ports, electricity works, the new theatre⁴⁷ and the abattoirs, which had often been discussed in the progressive English publication, the *Municipal Journal*. There was special interest in the handling and care of foodstuffs, including meat inspection, refrigeration methods and cold storage facilities.⁴⁸

One member of the Committee, M. P. Winfrey remarked on how the city of Cologne had kept the city's interests in mind by municipalizing the water, gas and electricity services. The tramways were admired for the way they made it possible for the city to plan and link the suburbs to the centre. An important feature for industrial policy was the fact that Cologne had planned an extension of the railway network to the industrial areas to facilitate the transport of goods. The Cologne school system (Volksschulen) was also studied and the reading rooms and small libraries built in the schools were especially admired. These were open in the evenings to the older pupils and even to the general public. In Berlin alone there were 16 district libraries of this kind operated in connection with the primary schools. Winfrey enquired why such premises could not be built in conjunction with the building of all new schools.⁴⁹

Dresden was always very active in arranging study tours and visits and already, in the planning stage of the British tour, a telegram was sent to the Committee from the Dresden

46. Lunn 1906, pp. 37—38.

47. Lunn 1906, pp. 47—51; Robert Donald (Editor of the Daily Chronicle), *Municipal Theatres abroad* (reprinted from the *Municipal Journal*), in: Lunn 1906, pp. 89—92.

48. Lunn 1906, pp. 49—50.

49. Lunn 1906, pp. 49—51; Robert Donald, *Lessons from Prussia* (reprinted from the *Municipal Journal*), in: Lunn 1906, pp. 76—83.

authorities inviting them to extend their North German visit to their city. Dresden, which the British compared to Birmingham in terms of its size, brought the visitors close to the efficiency of German municipal administration. As Lunn observed in his report, "the council consists of sixteen paid and twenty-two unpaid members, all the paid members (among whom are the Ober-Bürgermeister and two Bürgermeisters) being expected to devote their whole time to the service of the City. The Deputies numbering seventy-eight are elected for a term of three years, one third of the number retiring each year."⁵⁰

The atmosphere of the tour well described by the following passage from the Lunn report:

"and we returned via Berlin to England carrying with us an impression that will never fade, not merely of the greatness and prosperity of the German cities, and the skill and enterprise with which they were meeting the ever new problems of our complicated industrial life, but also of the unfeigned and generous friendliness with which we have been welcomed by their citizens."⁵¹

In official speeches the importance of the spirit of co-operation was referred to.

"They trust that the result of the studies will be of benefit to the cities to which they belong, and that the kind words with which they have treated them may find an echo in the hearts of our countrymen. Thus (these visits) strengthen the bonds which unite the two great branches of the Teutonic people."⁵²

In the German *Städte-Zeitung* A. Moeglich in his article *Kommunale Informationsreisen* reported on the British tour. Moeglich stressed the benefits of British comments for the German cities. He observed that a hundred years earlier and subsequently England had been in the forefront of urban development, but despite this, English cities were in some respects now lacking in comparison with cities and towns in

50. Lunn 1906, p. 68.

51. Lunn 1906, p. 69.

52. Lunn 1908, p. 131.

Germany. According to Moeglich textbooks and congress reports could not be compared to study tours, which he felt should be arranged systematically. The tours should not be limited to technical institutions alone but should include other aspects of civic life as well. Study tours were in particular important for city officials. However, Moeglich was convinced that German civic officials need not travel as far as England, as he felt that they could find what they needed in their own country.⁵³

The visits of the Municipal Committee in 1906 were made to Zürich, Innsbruck, Salzburg, Vienna, Carlsbad and Budapest. The later British study tour in 1907 to the towns and cities of Southern Germany was especially important in terms of its influence. The tour included Frankfurt am Main, Nuremberg, Munich, Heidelberg, Mannheim and Königswinter. A later report was entitled *Municipal Lessons from Southern Germany* and paid special attention to German municipal government. The importance of the tour for the Bavarians can be seen from the fact that the city of Munich published the speeches and toasts proposed at the banquet given by city in honour of the British visitors both in German and in English.⁵⁴

On this tour the methods of town extension in Frankfurt am Main were studied as well as the city's educational system, the streets and roads, street cleansing and sewerage and in Munich the educational system and the water supply.

The tour report went on:

"The main purpose and the chief usefulness of the tour promoted by the Municipal Committee are the instruction and education of British local authorities in the possibilities which local administration enjoys of improving the health, the efficiency, and the happiness of the people generally, and especially of that large class of the people who are workers. No one is so foolish as to suppose that the institutions of Prussia, Austria, Hungary or Switzerland can be transported bodily from their native soil and planted

53. A. Moeglich, *Kommunale Informationsreisen*, *Städte-Zeitung* 15.6.1905, pp. 522—523.

54. Henry S. Lunn, Note by the Author, in: Lunn 1908, p. viii.

in our own country, nor that the full information about them can not be dug out of treaties and Blue Books and consular reports. The Committee does not aspire to discover, but only to display to interested inquirers foreign plans of local government which have stood the test of trial and experience . . . The alderman who has neither inclination nor leisure to wade through a report will survey with pleasure a hospital, a school or a slaughter-house, will ask eager questions and fill his mind with useful information gathered at first hand. When he goes back to his city, he tells his brother aldermen and councillors what he has seen with his own eyes, and he is ready to consider any plan by which similar advantages can be obtained for the people of his own country."⁵⁵

The above shows clearly *the preference for information based on first-hand experience and observation*. It was believed that interested decision-makers could be influenced much more effectively through information based on personal contacts.

On this tour the British guests were again interested in the efficient administration of cities and especially the fact that the German cities and towns were administered by capable municipal officers. "The affairs of the city are managed not by amateurs but by experts. The rich, vain, ignorant upstart, who owes his position at the head of affairs to his own merits, but to the favour of a political party, is for the most part unknown."⁵⁶ Lord Lyveden referred to the signs that Germany had thoroughly applied in municipal life the scientific spirit which had made her success in commerce and industry so great.

The success of the city of Frankfurt was seen to be a result of the policies of Oberbürgermeister Dr. Adickes. He had brought about the so-called Adickes Law, which dealt with the systematic development of the suburbs in German towns.

"The most striking difference is due to the fact that in Germany new streets are not the creation of

55. Lunn 1908, pp. 3—4, 15.

56. Lunn 1908, pp. 5—6.

private enterprise. It is not the owner of the land who makes the plans for a new street according to his own interest; but the Town Council plans the streets in accordance with the interests and needs of the whole population."

The method of town planning followed by the Municipality was as follows:

"First of all, a plan is made showing the general scheme of the proposed new streets. The public is invited to inspect the plan and objections are received and considered by the body which has to sanction the plans, and which is known as the Bezirksausschuss. Only after the plan has been approved are buildings permitted to be erected."⁵⁷

Important in this connection was the fact that the streets were planned not merely for this year's or next year's convenience, but with a view to the probable requirements of a long period of time. Frankfurt was of importance not only because of its town planning and zoning possibilities but also because the building regulations of the city were drawn up by the City Council and not, as in many other German towns by the State Government. At a very early period regulations existed which forbade the erection of unhealthy houses, and, during the period of industrial expansion, of no cellar dwellings or back-to-back houses. "And it may be added, no slums — could come into existence," as Stadtrat Lautenschlager points out.

The city of Frankfurt provided a good example so far as the purchasing of land was concerned. Lautenschlager analysed it as follows: "Within the last ten years the city of Frankfurt has expended more than £10,000,000 in the purchase of land. There are no hindrances in the way of land purchase of by the municipality, and the city has always found good use for as much landed property as it possesses. It is needed for parks

57. Lunn 1908, pp. 40—41; Methods of Town Extension in Frankfurt, Report of a paper read by Herr Stadtrat Lautenschlager during the visit of British Municipal Committee to Frankfurt in May 1907, in: Lunn 1908, pp. 38—58.

and playgrounds, for docks and warehouses, for electrical works and tramway depôts, for hospitals and schools.⁷⁵⁸

The major idea of the city of Frankfurt was organising the labour bureau which Frankfurt was the first town in Germany to organize.

"It is composed of a committee of twelve, six of whom were employers of labour and six elected by the workmen. The rapid development of the work of the bureau since its formation is shown by the following figures: In 1895, there were 7,947 places vacant, 14,740 applications for work received, and 6,492 places were filled by the agency of the Bureau. In 1904, the vacancies were 42,471, the applications 66,340 and the places filled 34,050. The labour bureau of Frankfurt is more widely taken advantage of than any other similar institution in Germany and it is accepted as a valuable instrument for bringing the employer and the employee together."⁷⁵⁹

Also the housing of the working classes was another question which particularly interested the members of urban local authorities. The report *Municipal Lessons from Southern Germany* presented comparisons between the numbers of dwellings constructed by the Frankfurt Building Society (founded by the Frankfurt Trades Union) and those constructed by the London County Council. The comparison also listed rents and local services.⁶⁰

The educational institutions of Frankfurt were not subsidized to any great extent by the State. For the Higher and Middle Schools cities received no subsidies and British guests were presented with detailed figures on the costs of the schools. Comparisons showed the Gymnasien to be the most expensive (£13 per pupil), these were followed by modern subject schools (Realschulen and Realgymnasien) (from £9 to £7 per pupil) and the girls' higher schools (£3 per pupil) which were the pride of the city of Frankfurt. It is clear that the guests were shown aspects of municipal life with regard to which the cities in question saw themselves to be models. In the Frankfurt schools

58. Lunn 1908, p. 41.

59. Lunn 1908, pp. 15—16.

60. Lunn 1908, p. 16.

such features were the shower-baths (in almost all elementary schools) and medical inspection. The schools had also taken into account the cubic space allowed for each pupil. This was especially important for hygiene.⁶¹

The British were also interested in the question of whether social distinctions should be preserved in the schools. "In Frankfurt a strong party is of the opinion that the Common Schools should serve for all, and that all the children should pass through the 'Volksschulen' instead of taking the preparatory classes for the Higher Schools", commented Julius Ziehen in his paper. "There are, however, financial reasons against this course, as the Municipality would suffer a considerable loss by sacrificing the fees at present paid by the pupils in preparatory classes, and if these were discontinued the curriculum of the higher schools would have to be considerably modified."⁶² The compulsory school age was from six to fourteen and during these years education was free. A considerable number of pupils remained till they entered the top class and so completed whole course in the school. Special schools, "Hilfschulen" were established for children needing special treatment.

The British also noted a visit to the magnificent College of Commercial and Municipal Science erected by the philanthropy of eminent citizens at the cost of £150,000.

"Technical education forms an important part of the Frankfurt school system . . . It is now incumbent on employers to let their young employees off for a certain period during the day to receive instruction in a Technical School. In 1879 an Art Industry School was established by the Polytechnic Society and in 1895 the Frauensbildungsverein set on foot a similar school for girls . . . The Handelslehranstalt (or Commercial School) was established by the city of Frankfurt in 1903 after careful study of similar institutions in Saxony and Austria and the school was subsidized by the Chamber of Commerce."⁶³

61. The educational System of Frankfurt (Notes of the paper read by Stadtrat Julius Ziehen during the Visit of the British Municipal Society to Frankfurt in May 1907), in: Lunn 1908, pp. 30—31.

62. Lunn 1908, pp. 31—32.

63. Lunn 1908, pp. 35—37.

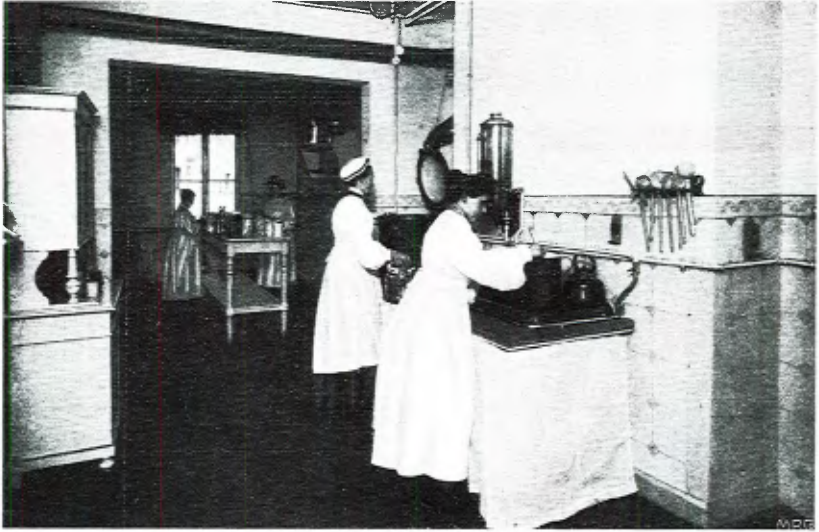


Figure 28.

*Hygiene was prime importance in combating infant mortality. Pasteurization of milk for infants, Munich 1907. (K. Singer, *Hygiene & soziale Fürsorge in München. Eine Auswahl von Einrichtungen in Bild & Zahlen*, Munich 1907)*

In summarizing the school system it was noted that it had grown on the basis of the needs of local inhabitants and the municipal government had readily accepted responsibility for equipping its young citizens as full as possible for the battle of life. So Frankfurt was an example for various kinds of municipal Institutions.

In Nuremberg the British were shown the new municipal theatre, where new technology, including electric lighting had been used. The visitors observed that "the German Theatre is a truly popular institution" as the ticket prices appeared to be very reasonable in comparison with those charged at London theatres. Visits were made to the hospital and the gas works.⁶⁴

⁶⁴. Lunn 1908, pp. 72—77.

The school system and water supply facilities were also emphasized in Munich. Dr. Singer, Director of the Municipal Statistical Department, lectured in English on the water supply of Munich, which was claimed the cheapest in Germany, 100 litres costing only 5 pfennigs and "the purest water that could be imagined". The report praised Munich and the visit arranged there with its hospitality. At the Banquet given by the city of Munich in the Rathaus "the English Mayors wore their gold chains and some of the visitors appeared in the uniforms of Sheriffs; court dress or uniform was generally worn, and this added considerably to the brilliance and picturesqueness of the scene". Speeches referred to the joint past of Bavaria and England ranging from the origins of Christianity to the effects of English literature on Bavaria and Germany. It was stressed that "there can be only friendly rivalry between us wherever the German and British spirit of enterprise enter into competition throughout the world". Once again there were underlined the importance of personal contacts. Dr. von Borscht Bürgermeister of Munich emphasized *the spirit*:

"For the members of this committee the question is not so much to get information about the condition of such and such an institution but to become acquainted with the spirit which led to the creation of these institutions to gain an intimate knowledge of German manners, German character and of the organisation of German labour, and to get this knowledge from those circles which are mostly interested in the promotion of public good and welfare: the German citizens."⁶⁵

Professor Sieper even went so far as to refer:

"Repeatedly has the idea been expressed to have an exchange of professors not only with America but also between Germany and England. Even in regard to Grammar Schools — nay, even students — such an exchange might take place. This idea has already

65. Prosperity to the British Committee proposed Dr. von Borscht, First Bur-
gomaster of Munich; Lunn 1908, pp. 86—87.

taken shape in Cecil Rhodes Scholarships. But nothing seems to me more promising than those systematically arranged excursions which the British Committee has already practically organized, thereby leading men of both nations come in personal contact... Such meetings are rich in opportunities for the social exchange of feelings and thoughts."⁶⁶

In Mannheim the docks were shown to the visitors. Mannheim had the largest inland port of Europe with enormous municipal and state docks.

The atmosphere of the tour was well described in a speech by Alderman Adnitt, Ex-Mayor of Northampton at the end of the tour:

"Yes, we will keep the friendship which we have here formed, and after our return we shall regard it as our most sacred duty to win new members for this union. We shall tell them of the magnificent industrial undertakings that we have seen in Germany, and especially in Munich, and we shall tell them of the festive receptions with which you have honoured us, and which will take their place among the most cherished memories of our lives. We will do everything possible to remove the late misunderstandings between Germany and England, so that the greatest crime which history could know — a war between Germany and England — may become an impossibility."⁶⁷

The political importance and significance of the German tour can be seen from the telegram of thanks sent by the Committee to the Kaiser on the last day of their tour.⁶⁸

At the time of the tour there had been, especially in the British press, expressions of anti-German sentiments. Thus, the

66. Toasts proposed at the Banquet given by the City of Munich in Honour of the British Committee for the Study of Foreign Municipal Institutions, Munich 1908; Lunn 1908, p. 97.

67. Speech of Alderman Adnitt (Ex-Mayor of Northampton), quoted in: Lunn 1908, pp. 109—110.

68. Lunn 1908, p. 131.

tour was especially well received in Germany. The First Bürgermeister of Munich von Borscht described the visit in the following terms:

"The organization of the British Committee for the Study of Foreign Municipal Institutions marks an epoch in the history of civilization, for quite apart from the secret and tangled ways of high policy, it opens a wide field of work for all friends of peace between nations, of whatever nationality they may be, for all those who are willing to keep and augment the highest possessions of mankind."⁶⁹

It was observed with pleasure that commercial competition need not necessarily lead to a cooling of political relations, as there had been commercial competition at all times and periods.⁷⁰

Contacts between the British and German cities continued after this tour to a lesser degree until 1912. In May 1908 Burgomasters from Southern Germany visited England and a month later the representatives of the city of Hull visited Frankfurt am Main, Leipzig, Berlin and Hamburg. A year later a delegation from the cities of Manchester and Salford visited Düsseldorf, Barmen, Cologne and Hamburg. In 1910 the Lord Mayor of Birmingham visited Berlin, Munich, Vienna, Mannheim, Frankfurt am Main and Düsseldorf. In 1912 invited the city of Glasgow 25 German Burgomasters to Scotland. The tour was made in 1914 and only 11 German cities sent participants.⁷¹

It can be seen that the British Mayors and Ex-Mayors often visited the same cities, viz. Berlin, Dresden, Munich and Hamburg. On nearly each occasion the study tours included innovative cities such as Frankfurt am Main, Cologne, Düsseldorf and Mannheim. These cities had active longstanding Burgomasters. Of the industrial cities the textile cities of Aachen and Barmen were included in the itinerary of several visits.

The maintenance of friendly relations between Germany and England were the responsibility not only of the British

69. Lunn 1908, pp. 86—87.

70. See Deckart 1967, pp. 61—65.

71. Deckart 1967, pp. 65—70.

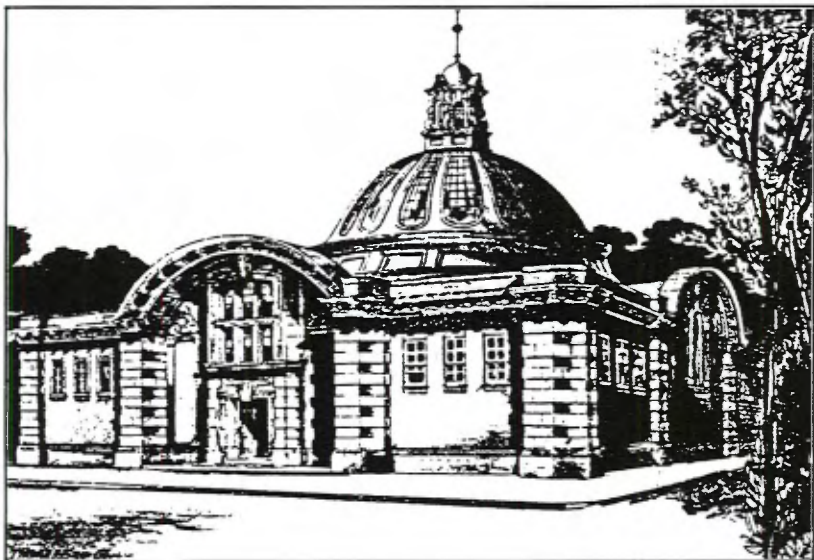


Figure 29.

Public libraries were among the services studied by German observers in England. The New Passmore Edwards Library at Plaistow. (The Municipal Journal, May 8, 1902)

Committee for the Study of Foreign Municipal Institutions but also of several societies, such as the Anglo-German Friendship Society⁷² while Anglo-German Understanding Conferences were held in 1906 and 1912.⁷³ The former British Ambassador to Berlin Frank G. Lascelles was especially active in this respect as well as the same people who had participated in the excursions, for example Professor Sieper of Munich and Lord Avebury of London. At the Anglo-German Understanding Conference Herr Professor Rathgen spoke on Commercial and economic competition, stressing that the importance of

72. Englisch-Deutsche Freundschafts-Bestrebungen. (British German Friendship Society), in: Die Deutsche Kolonie in England, London 1913, pp. 98—99; The Anglo-German Friendship Committee, London 1906.

73. Report on Proceedings of the Anglo-German Understanding Conference, London 1912, pp. 3—5, 133—140 (The Promotion of Mutual Knowledge of the two countries and their common tasks in the development of culture, Speech of Professor Dr. Ernst Sieper).

"the German market for British trade appears from the fact that Germany takes more British goods than Russian and France together; and the share which Germany takes of British exports is increasing... The origin of that great advance of foreign trade which with short interruptions is one of the signs of our time, did not begin in the United States, but in Germany, about 1885."⁷⁴

Lord Avebury who belonged to Liberal-Unionists referred to the debt felt towards Germany in certain particulars, e.g. the Reformation.⁷⁵ Lord Avebury promoted friendship not only between Great Britain and Germany but also between Great Britain, Germany and France.⁷⁶

The experience of individual persons

Co-operation at the level of official meetings and conferences required contacts and co-operation between private individuals. It was hoped that prejudices could best be eradicated by increasing information, as many prejudices arose from a lack of knowledge. For example the Co-operative Holiday Association in the late 1890's "decided to venture abroad, because we knew full well that our insular-minded countrymen would get more education by going to Germany, France and Switzerland, than simply staying at home in their own visiting places. The consequence has been that year by year our members have increased, and this year we sent upwards of 17,000 of our members to various parts of the country." In Germany the Rhine area and Frankfurt were regions where travel had opened up close contacts with people.

74. Professor Dr. Karl Rathgen, Commercial and Economic Competition, Report on the Proceedings of the Anglo-German Understanding Conference, London 1912, pp. 17—24.

75. Lord Avebury's speech in the inaugural meeting in Caxton Hall, Report of the Proceedings of the Anglo-German Understanding Conference, London 1912, pp. 5—7.

76. Hollenberg 1974, p. 73.

The association aimed at providing the tourists with sufficient information and arranging a varied programme for the tours. The holiday tourists were not only shown historical buildings and monuments but were also taken to municipal institutions, schools and factories.⁷⁷

There were corresponding societies in Frankfurt and Berlin. The latter called itself the Berlin Friends of the Co-operative Holiday Association and worked to organize holidays for English people coming to Germany and visiting the Harz, Dresden and Berlin and meeting Germans. The societies arranged meetings and English-language discussions.

Individual scholars, authors and influential persons visited cities and municipal trading institutions presenting effective reports of their observations in the form of books and articles. As a rule Americans came to England and Scotland and the English visited the Continent.

The observations of the Americans can be found in the works of an archetypical American progressive Frederic C. Howe and in Albert Shaw's work on the administration of English towns and cities. Shaw's work *The Municipal Government of Continental Europe* was one of the most quoted works in the *Municipal Journal*. It was shown that a great many European cities had increased more rapidly than St. Louis or Denver in America and the enormous growth of such cities as Hamburg and Berlin was something common to the whole civilized world. Vienna had trebled its population in two years, Amsterdam and other Dutch towns had doubled theirs within the same time and the same course of development had occurred in Berlin, Barcelona and Budapest.⁷⁸

Howe's "The City, Hope and Democracy" was based on his tour and enquiries in England and Scotland. The book was presented in the *Municipal Journal* under the heading "As

77. Speech of T. A. Leonard (Secretary of the Co-operative Holiday Association), Report on the proceedings of the Anglo-German Understanding Conference London 1912, pp. 151—153.

78. Frederic C. Howe, *European Cities at Work*, New York 1913, pp. 3—4. According to Paul Boyer Howe was in many respects a prototypical American Progressive, Paul Boyer, *Urban Masses and Moral Order in America 1820—1920*, Cambridge Mass., 1978, p. 197; *Municipal Government in Continental Europe*, London 9.1.1895.

others see us". This corrected the impression Howe had received of the extent of municipal trading in the British Isles.⁷⁹

Howe said in his study *European Cities at Work*, published in 1913: "I know of no cities in the modern world which compare with those which have arisen in Germany during the past twenty years. There are none in Great Britain, from which country official delegations constantly cross the North Sea to study the achievements of the German city . . ."⁸⁰ According to Howe Germany was almost alone among the civilized nations considering the city as the centre of the civilization of the future.

Among foreign observers, including Americans, English municipal trading was one of the areas studied. For example the Commission appointed by the National Civic Federation of New York City, a body composed of prominent persons from all parties and sections in the United States represented various interests, ideas and movements. The membership of the Federation included such well known names as Andrew Carnegie, August Belmont and ex-minister Cleveland. In 1905 the Federation appointed a 150-member Commission to undertake an investigation, which also included Britain. The report shows that the British towns were in many respects close to the American towns and cities.⁸¹

Significant co-operation and the spreading of innovations occurred in the field of town planning, as referred to in studies by Anthony Sutcliffe among others.

One of the innovators in this field was T. C. Horsfall whose work "The Example of Germany" presented comparisons of housing and described various solutions for promoting construction, including building societies. In 1900 there were in Germany 17,229 incorporated companies and 620 non-incorporated companies, which were largely responsible for the barrack like dwellings. Horsfall also compared problems of city sanitation and building control in England and on the Continent. Like others, he also chose Frankfurt a.M. as an example

79. As other see us, *The Municipal Journal* 4.5.1906, p. 83.

80. Howe 1913, pp. 3—4.

81. *London and Continental Cities*. Frederic Harrison shows how London is Being Out-distanced of the towns of Germany and France, *London* 30.1.1896, pp. 94—95.

and expressed admiration for the administration of German cities and especially for the administrative personnel; "Germany owes a great debt to these permanent municipal officials."⁸²

The frame of reference of London consisted clearly of the European capitals, Paris, Berlin, Vienna. The chairman of the London County Council, Sir Edwin Cornwall, proposed a Congress of Capitals in 1905, which signified an attempt to increase co-operation between European cities. When the representatives of London returned from Paris in 1905, he proposed that representatives of the great municipalities (beyond half million) would meet in a metropolis and discuss and study problems common to all large centres of population. There would be a "Congress of Capitals of the Civilized World", which would include London, Paris, Berlin, Vienna, Budapest, Rome, St. Petersburg, Madrid, Constantinople, New York, Chicago and Philadelphia. Common problems to be discussed would be the housing of the working class, communications and education. According to Cornwall, "the London County Council, for example has no part in the lighting of the metropolis with gas and electricity, for which the municipalities of many European capitals, including, as I understand, Vienna, are responsible." In addition to the Congress Cornwall also planned public international education, by which term he meant an exchange of municipal scholars among the several capitals.⁸³

The frame of reference for London is also confirmed by the content of the journal *London* (later the *Municipal Journal*).

In an issue published April 27.1893 the journal discussed the Berlin abattoirs and in May of the same year the water supply networks of Paris.⁸⁴ The abattoirs and meat inspection arrangements of Vienna, Berlin and Paris were described as exemplary. Berlin was an example with respect to the microscopic inspection of samples of all meat sold in the

82. T. C. Horsfall, *The Improvement of the Dwellings and Surroundings of the People. The Example of Germany*, Manchester 1904; T. C. Horsfall, *German Town planning*, *The Municipal Journal* 10.1.1908, p. 25.

83. *The Congress of Capitals*, *The Municipal Journal* 29.12.1905, p. 1455.

84. *Abattoirs in Berlin*, *London* 27.4.1893 p. 196; *The Paris Water Supply*, *London* 11.5.1893, p. 228.

market and the efficiency with which the arrangements for slaughtering were carried out, it was felt, might well be copied in London. M. Jules Cameau, Vice-President of the Paris Town Council gave an account of the municipal abattoirs of Paris in an 1894 issue of London.⁸⁵

Extracts from Albert Palmberg's work entitled *A Treatise on Public Health*⁸⁶ by the Finnish doctor (discussed more fully below), appeared on many occasions in the journal London. The study showed Brussels and Vienna as providing examples for England in the sphere of health services. "Brussels possesses the most complete sanitary administration of any continental town." It was in the hands of a special authority created in 1874. This included a medical inspector who was the head of the department and he was assisted by divisional officers who were also medical men. Brussels also had features worthy of admiration such as the water supply, public markets and food control.⁸⁷ Sanitary science and the rapid growth of public interest in sanitation on the Continent were areas especially discussed in the 1890's.

It is stated that Albert Palmberg's invaluable *A Treatise on Public Health* as regulated in the principal cities of Europe possessed several points of interest to Londoners, for example in Vienna all plans for buildings had to be subjected to careful examination with regard to sanitary arrangements and systems of ventilation. Public baths were also discussed.⁸⁸

Many of the foreign experiences described were based on visits and tours. Thomas Blashill, for example, superintending architect of the London County Council, submitted an interesting report on public slaughterhouses in Continental cities and in none of the cities which he visited, which included Frankfurt, Leipzig, Halle, Eisensee and Wiesbaden, did he discover private slaughterhouses, while the public institutions

85. Sanitary Progress and Health Problems, London 27.11.1894, p. 617; Pure Milk, London 20.7.1893, p. 390.

86. Albert Palmberg, *A Treatise on Public Health and its Applications in Different European Countries* (England, France, Belgium, Germany, Austria, Sweden and Finland). Translated from the French edition and the section on England ed. by Arthur Newsholme, 2nd ed. London 1895, p. 539.

87. Municipal work in Brussels, London 20.2.1896, pp. 167—168; Lessons from Brussels, The Municipal Journal 23.3.1899, p. 127.

88. Lessons from Vienna, The Municipal Journal 1.6.1893, p. 285.

were of the most modern construction. Strasbourg had also recently constructed an establishment of the improved type as well as Cologne. New technology was likewise applied in Paris, Frankfurt, Wiesbaden and Leipzig. Blashill was convinced that within ten years no German city would be without the latest techniques in this field and like most observers, he also presented a pessimistic view of the situation in England.⁸⁹

In the early 1900's reviews of foreign experiences with respect to various services in Germany increased in number in the *Municipal Journal*. In 1900 municipal government in Germany was given special emphasis and in 1904 there was a major series of articles on housing in Western Europe.⁹⁰

In 1906 the journal published a three-part series of articles with the title "Lessons from Paris" while the issue of June 22nd, 1906 discussed the Frankfurt tramway service.⁹¹

Of the German cities Düsseldorf was clearly presented far more often than others "as a model city". Frankfurt am Main, Wiesbaden, Cologne, Berlin and Munich were also favourite subjects for British attention. Most of these showed up well with respect to the number of services per inhabitant and as discussed above it was especially Wiesbaden along with Cologne, Frankfurt a.M. and Düsseldorf that led the field with respect to infrastructural services.

However the examples of other British cities were also important to the readers of the *Municipal Journal*, in particular those of Birmingham and Manchester and above all, the successful municipal policies of certain Scottish cities (e.g. the Glasgow trams).

An interesting question is, whether the above-mentioned cities that led the field with respect to municipal services were also the ones that aroused interest and visits from the Nordic countries.

89. Thomas Blashill, *Municipal Abattoirs in German Cities*, *The Municipal Journal* 2.2.1899, p. 133.

90. *Germany's Housing Problems*, *The Municipal Journal* 18.10.1901, p. 802; *Housing in Western Europe*, *The Municipal Journal* 9.9.1904; See also *Housing and Town Planning Progress. The Official Monthly Record of the National Housing and Town Planning*, *The Municipal Journal* 11.2.1911, p. 130, 8.4.1911, pp. 321—322, 2.9.1911, pp. 833—834, 9.12.1911, p. 1168.

91. *Frankfurt Tramway service*, *The Municipal Journal* 22.6.1906, p. 679; See also: *Tramway chiefs in conference*, *The Municipal Journal* 4.10.1907, pp. 850—851.

Case studies from Stockholm and Helsinki

In 1912 the Swedish newspaper *Aftonbladet* sent a special correspondent on a tour of European cities to study how problems that were seen as the most relevant for the city of Stockholm had been solved. These were the question of the ownership of tramways (public, private, concession-based), traffic between the suburbs and the centre and the distribution of foodstuffs. The tour concerned countries "whose customs, way of life and views resemble ours the most, viz. the Germanic countries. These will also include England, as well as areas where these countries have taken practical steps that can be applied here and also the main Romanic countries, France and Italy." During the course of one year the correspondent studied the above problems in various European cities and submitted a total of 36 articles, published in *Aftonbladet* from November 1912 to August 1913.⁹²

In the German cities studied (Berlin, Munich, Strasbourg, Mannheim, Saarbrücken, and Königsberg) the correspondent observed that in Munich the issue of tramway ownership had been solved in a manner similar to that of Stockholm where public ownership had replaced private ownership of tramways.⁹³ In Munich it could also be observed how the construction of tramlines had affected the suburbs by increasing construction, leveling the price of land and decreasing rents.⁹⁴

The correspondent did not take unconditionally support municipal ownership. In Munich he interviewed Dr. Kühle, a tramways expert, and compared the income of the privately-owned Berlin tramway system with that of the municipally-

92. Kommunikationsstudier i Europas storstäder. Brev från en Aftonbladets specialkorrespondent, *Aftonbladet* 16.11.1912; Förberedelser i Berlin — Ner till München, *Aftonbladet* 21.11.1912.

93. Kommunikationsväsendet i Europas storstäder. Förberedelser i Berlin — ner till München, *Aftonbladet* 21.11.1912; Stadskommunikationerna och bostadsbristen. Erfarenheter från München, *Aftonbladet* 24.11.1912.

94. Några officiella siffror och några jämförelser mellan förhållandena i München samt i Berlin och Hamburg, *Aftonbladet* 4.12.1912; Stadskommunikationerna och bostadsbristen. Erfarenheter från München, *Aftonbladet* 24.11.1912.



Figure 30.

Children in the Esplanade park in Helsinki in the 1910s. The Esplanade was a popular place for promenades. (Photo: I. Timiriasew, Collections of the Helsinki City Museum)

owned Munich system presenting, with reference to Lord Avebury, the efficiency of private tramway administration but also the effect of public ownership on lowering tariffs. The correspondent also discussed other forms of public transport, buses, subways and city railroads (Stadtbahn).⁹⁵ The correspondent's tour provided a glimpse of the administration of municipal enterprises and the directing of municipal institutions. Although he did not visit Frankfurt am Main, he

95. Kommunaldrift eller enskild drift vid spårvägarna? Vad man säger på ledande fackmannahåll i München, Aftonbladet 27.11.1912.

described the atmosphere and local character of the city in the following terms: "All are businessmen there and this is reflected everywhere in the city in the conduct of municipal affairs. In Hamburg he also admires the intensity and energy of the Germans as well as their businesslike sense of purpose in all that they undertake and in all that promotes the economics, political and cultural progress of their country."⁹⁶

The correspondent also expressed his admiration for the costs of living in Munich, describing it as "a fortunate city". He describes the construction of market hall, the inspection of foodstuffs, as well as presenting refrigeration plants, coldstorage facilities and regulations concerning the inspection of foodstuffs and market trade.⁹⁷

The correspondent next visited the Rhine-Westphalia area and one of "the largest city in Europe", the area formed by Essen and Bochum in North and Barmen and Elberfeld and Düsseldorf in the South along the Rhine. The articles present solutions concerning transport and traffic, joint private and public companies for trams and the wide asphalt-covered streets.⁹⁸ He admired the enthusiasm related to the conduct of municipal affairs. Admiration was also expressed for the pensioners' dwellings arranged by the Krupp plant for its former employees in an area also with other services including a library and a church. Also the contribution of the Krupp plants to municipal life was described.⁹⁹

At a later stage the correspondent also studied the tramway systems of Mannheim (municipal), Strasbourg (joint private and public company) Cologne (municipal), Düsseldorf (municipal trams and joint private and public company), Amsterdam (municipal), London (public and private), Brussels (private), Milan (joint private and public company), Vienna (municipal), Berlin (private), Königsberg (municipal), Copen-

96. I samfärdselns tecken. Trafikmedlen i Hamburg. Aftonbladet 13.12.1912.

97. Hur skall man nedbringa livsmedelprisen? Åtgärder i München från kommunens sida, Aftonbladet 29.11.1912.

98. "Europas största stad." Med bil genom Rhen-Westfaliska industridistriktet, Aftonbladet 27.12.1912; Kommunikationssystemet i det Rhen-Westfaliska industridistriktet, Aftonbladet 28.12.1912.

99. "Europas största stad." Med bil genom Rhen-Westfaliska industridistriktet, Aftonbladet 27.12.1912.

hagen (municipal) and Christiania.¹⁰⁰ From England he reported about the struggle between private and public ownership concerning not only trams but various services.¹⁰¹

Especially in Düsseldorf the effects of the tramways on land allotment policies and housing could be seen. There the local decision-makers seem to be discovered the means to promote industry in the city.¹⁰²

In addition to Munich, Berlin, Cologne and Amsterdam also provided comparative material for Stockholm in the issue of foodstuff distribution and the costs of living¹⁰³ and Brussels and Amsterdam for the housing problem of workers.¹⁰⁴

The articles published in Aftonbladet on the municipal enterprises of the German cities provide an overall positive view of their subject. The description resembles the above-mentioned reports by Lunn except for the fact that each of the articles by the Swedish correspondent stressed comparisons between Stockholm and the European cities. This series of articles demonstrates how open transmission of information, personal reporting and interviews of experts, civic authorities

100. Erfarenheter från Mannheim, Aftonbladet 25.1.1913; Kommunikationsstudier i Europas städer. I det tyska Strassburg, Aftonbladet 28.1.1913; Kölns spårvägar, Aftonbladet 3.2.1913; Spårvägssystem i Düsseldorf 4.1.1913; Amsterdams spårvägar. Rent kommunal drift, Aftonbladet 16.2.1913; Enskilda och kommunala spårvägar i London. Londons enskilda och kommunala kommunikationsföretag, Aftonbladet 2.3.1913; Bryssels spårvägar. Ett typiskt exempel på rent enskild drift, Aftonbladet 6.4.1913; Tomtpolitiken i Belgien. Egna hem och billiga arbetarebostäder, Aftonbladet 20.4.1913; Spårvägsfrågan i Frankrike, Aftonbladet 25.5.1913; Spårvägssystemet i Milano, Aftonbladet 1.6.1913; Wienspårvägarnas utveckling till kommunala, Aftonbladet 8.6.1913; Wien spårvägar som kommunala, Aftonbladet 15.6.1913; En världsmetropolis trafikmedel, Aftonbladet 24.6.1913; Berlins spårvägar, Aftonbladet 29.6.1913; Spårvägarna i Königsberg, Aftonbladet 6.2.1913; Spårväghållandena i Köbenhavn, Aftonbladet 27.7.1913; Kristiania spårvägsfråga, Aftonbladet 3.8.1913.

101. Den allmännyttiga företagen i England, Aftonbladet 23.2.1913.

102. Düsseldorfs utveckling och den kommunala tomtpolitiken där, Aftonbladet 14.1.1913.

103. Livsmedelfrågan bedömd av överinspektören för Berlins saluhallar, Aftonbladet 29.12.1912; Liv och livsmedel i Köln, Aftonbladet 7.2.1913; Tomtpolitik och livsmedelpris i Amsterdam, Aftonbladet 20.2.1913.

104. Den belgiska tomtpolitikens allmänna grundsatser och lärdomar, Aftonbladet 18.5.1913; Socialt kommunalt arbete i Amsterdam, Aftonbladet 30.3.1913.

e.g. Burgomaster of Düsseldorf provide a great amount of material for decision-makers.

In comparing the German cities visited by the English mayors and the Aftonbladet correspondent similarities can be observed. In both cases the largest administrative cities were on the itinerary as well as the innovative cities of South-Western Germany. The unsolved traffic problems of Stockholm led the correspondent to visit also the Rhine-Westphalia area and Königsberg.

In this connection *the life and work of professor Albert Palmberg*, a Finnish district surgeon from Helsinki is of interest as an excellent example of the possibilities afforded by congresses, study tours and knowledge of international statistical exchanges. Palmberg brought together in his work all the information and knowledge he had obtained through active participation in international congresses such as the congresses on hygiene held in Paris in 1889, Budapest in 1894 and Madrid in 1898 as well as by keeping abreast of the international literature and statistics in his field.

Palmberg was interested in hygiene and he had many active followers in Finland (for example Konrad Relander and Max Oker-Blom). On the basis of his own observations and the latest foreign studies and statistics Palmberg described mortality in the various European countries and cities along with possible explanatory factors from the fields of public hygiene. Palmberg's study was based on information on typhus and data from Brussels, Paris and St. Petersburg as well as from London, Stockholm, Danzig and Leipzig. Other model cities in the study were Frankfurt am Main, Munich, Dresden, Breslau, Stuttgart and Hamburg. Palmberg observed that in these towns the drinking water was of good quality and the municipal sanitary services were of a high level. For these reasons mortality figures for the period 1878—1882 were relatively low. Palmberg's main source in his comparisons of the German towns was the series *Veröffentlichungen des Kaiserlichen Gesundheitsamtes* and Erwin Smith's comparative study *The influence of sewerage and water supply on the death rate in cities*.¹⁰⁵

105. Palmberg 1887; Erwin Smith's comparative Study. The influence of sewerage and water supply on the death rate in cities was published in the Supplement to the annual report of the Michigan State Board of Health 1885.

In his work Palmberg made excellent use of his information, combining it in developing health care conditions in Helsinki during its none too rapid period of growth. He served as district surgeon from 1887 to 1896 and specialized in the care of school children, especially in the prevention of tuberculosis and other contagious diseases. Palmberg read a paper on this subject at the international congress on hygiene in Budapest and was also awarded the first prize for his publication at the Exhibition of Infant Hygiene in Paris in 1887.¹⁰⁶ Palmberg's invaluable book *Allmän hälsovårdslära* in Swedish in 1889,¹⁰⁷ Spanish 1890, French 1891, English 1893 was used as textbook in Spanish and British medical faculties.¹⁰⁸ As mentioned in chapter 11. he also offered advice on the construction of sewer networks in the Finnish towns and on the founding of municipal sanitary authorities.

Palmberg's ideas and plans were furthered by his successor, District Surgeon Relander. Many visits and tours were made from Helsinki to the exhibitions of continental Europe and in these connections municipal services also became known. A good example of how the whole Europe was following the same pattern in this respect is a study tour by District Surgeon Relander in 1894—1895 to various cities of Europe.

Relander submitted to the State Medical Board a 600-page report on a tour, which took him to the congress on hygiene in Budapest. Other places visited were Prague, Vienna, several German cities, London and the principal Nordic towns and cities. He studied the water supply in Prague, Amsterdam and Gothenburg, sewerage in Stockholm, Köping, Berlin and Munich. Slaughterhouses and meat inspection facilities were visited in Leipzig, Budapest, Munich and Edinburgh.

106. Albert Palmberg, *Berättelse öfver en med statsmedel verkställd resa till VIII internationella kongressen för hygien och demografi i Budapest den 1—9 september 1894*, Finska Läkarsällskapets Handlingar, Bd. 37, Häft 1, 1895;

Albert Palmberg *Grand Duché de Finlande. Ville de Wiborg. Catalogue spécial. Quelques notices sur l'hygiène de l'enfance, à Wiborg. Exposition d'hygiène de l'enfance, Paris 1887, Wiborg 1887.*

107. Albert Palmberg, *Allmän hälsovårdslära på grund af dess tillämpning i olika länder*, Borgå 1889. Albert Palmberg, et.al., *School institutions and school hygiene in the Grand Duchy of Finland*, Helsingfors 1907.

108. Pesonen 1980, p. 346.

Disinfection arrangements were investigated in Stockholm, Christiania and Amsterdam, street-cleaning in Stockholm, Västerås, Arboga, Örebro, Gothenburg, Prague, Stuttgart, Karlsruhe and Munich, hygienic institutions in Rostock, Leipzig and Prague and museums of hygiene in Berlin, Vienna and London. Prevention of epidemic diseases was studied in Stockholm, Gothenburg, Christiania, Karlsruhe, London and Edinburgh!¹⁰⁹

Exchange of information took place at many levels especially in connection with the building of the infrastructure and the developing of health care services.

As a broad generalization it can be said that in Helsinki and the other Finnish towns experts were first sent abroad to acquaint themselves with achievements in the fields concerned and to develop expertise. However, from the end of the 19th century onwards a new emphasis was placed on the award of funds for participation in congresses, where information could be effectively obtained from many sources. Further it was the practice of touring extensively in Europe in connection with the congress trips.

These tours were for the purpose of visiting institutions which were known to display a high level of know-how.

The importance of personal contacts is shown by a ruling of the Helsinki City Council in 1912 whereby the inspector of the municipal kindergartens was required to carry out a two-month study tour of kindergartens in various European cities before accepting the position.¹¹⁰

With respect to certain municipal services the model city could be referred to directly. For example, Strasbourg is given as the model in establishing dental services for schoolchildren. Many of the models adopted by the Finns were recognized as being from the most innovative cities at an international level.¹¹¹

In all the Nordic countries also personal study trips and

109. Konrad Relander, *Kertomus hygieniseltä opintomatkalta Eurooppaan 1894—1895* (Lääkintöhallitus, Matkakertomukset 1894—96, National Archives of Finland).

110. *Reseberättelse av fröken Thyra Gahmberg, inspektör vid de med kommunala medel understödda barnträdgårdarna Helsingfors, Helsingfors 1913.*

111. Hietala 1983, pp. 34—35.

tours were a common method for promoting new innovations. Persons involved in these were mainly experts in engineering as well as persons in the field of health care. Interest in Central European towns and cities often dated in these cases back to student days.

Spread of innovations — conclusions

What follows the results of the study are related to previous theoretical considerations regarding the spread of innovations.

Traditional, or in some sense even classical views stress the distribution of innovations in stages from centres on higher hierarchical levels to centres on lower levels — from the capital to the periphery and from developed countries to undeveloped countries (Torsten Hägerstrand).¹¹² On the other hand, on the individual level certain pioneer types are the first to adopt innovations and are followed by others once they notice personally the benefits of the innovation concerned (Everett Rogers).¹¹³

On a broad general level these regularities apply. However, in reality the scene is more complicated and *it is not*, for example, *sufficient to describe in adequate detail a town or city as a receiver, generator/distributing agent or follower of innovations. Almost all towns and cities seem to have performed these three roles simultaneously.* Regardless of its position with respect to the central hierarchy or its stage of growth, a town or city could even have something to offer. It was usually known, which towns or cities were examples in which respect. Periodicals and comparative municipal statistics were central in the spreading of this information.

The channels for the spread of information formed a complementary and interrelated whole, which changed and developed along with technological development and progress.

112. Torsten Hägerstrand, Aspects of Spatial Structure of Social Communication and the Diffusion of Information. Regional Science Association Papers, Philadelphia 1966, pp. 27—42.

113. Everett Rogers, Diffusion of Innovations, 2. ed. New York 1983.

Initially, the spread of innovations depended greatly on *personal contacts and study tours abroad*. In the period studied these were supplemented — but not replaced — by *periodicals, municipal and comparative statistics, congresses and exhibitions*.

Before the period of publications, statistics, congresses and exhibitions, the spread of information was relatively sporadic and the personal activity and contacts of those seeking information were of decisive importance. Later, periodicals and the developing system of comparative statistics kept up a continual flow of information on the rate of progress of the towns and cities concerned with respect to various issues and matters. Regular congresses and civic exhibitions in turn provided a more detailed cross-section of the pertinent issues. *The spread of innovations became institutionalized.*

Civic rivalry and competition, on the other hand, gave the towns and cities incentive to display their achievements. Progress was not a well-kept business secret. In fact, progress was a definite goal aimed at in order to show others how advanced and skilled the management of civic affairs could be. This, in turn, strengthened feelings of civic pride thus creating a motivational environment facilitating the spreading of innovations. *If the innovations had been kept under cover they would not have been able to spread as effectively as described in this chapter and growth and development would not have been as rapid as they were in this period when industrialization was at its height. Especially in Germany, centralized administration, an effective civil service and system of planning were instrumental in the spreading of innovations.* Often these factors were co-ordinated and led by a long-term Mayor or Burgomaster.

15. Conclusions

Urbanization, which had started in Great Britain alongside industrialization, was, by the end of the 19th century proceeding on an unparalleled scale all over western Europe and the problems facing large cities were the same everywhere. The internal migration into towns and cities forced decisions on many issues concerning everybody. The construction of dwellings for the masses arriving in the cities, supplying water, the provision of foodstuffs refuse collection energy matters all demanded instant attention. How to arrange transport and communications, public health services and education and training as well as what would be on offer for people in their leisure time, all awoke debates on who should organize the respective services and under what circumstances.

The aims of the study and research material

The aim of this study was to investigate *how services developed in various types of cities. Which typology of cities was most suited to the analysis and which were the best operational measures of services? What part did the diffusion of innovations play in the growth and development of services in cities?*

The study was based on the hypothesis that cities, which are at different stages of growth (take-off, accelerating and slackening growth) respond differently to the need for services. This approach proved very useful when allocating German cities to different categories.

The main bulk of research material collated concerned 44 cities in Imperial Germany. Information was also used

concerning English, Scottish, Welsh, Irish and two Nordic cities (Helsinki and Stockholm), where this was applicable and especially when investigating the spreading of innovation. The research covered a period embracing the final decades of the 19th century to the 1910's.

In order to study services the cities were divided into different categories. The classification was decided on the basis of the industrial structure of cities, their speed of growth and their historical development. The following groups emerged: *administrative cities*, *commercial cities*, *textile industry cities*, *metal industry cities*, *garrison cities* and *regional centres*. The capitals of states were classified as administrative cities. Garrison cities were distinguished from the latter because a major sector of their population was employed in military service. The textile cities were distinguished from the metal industry centres because they had reached the various stages of industrial development at a different rate. Towns were classified as regional centres when they had an influence over a wide area of the country but no clear-cut industrial structure. In addition, the cities were classified into various groups according to their geographical location (in the Ruhr area, in the southern and south-western part of Germany, Central Germany, the north and north western part of Germany or in the eastern part of Germany).

The subjects of research were the essential infrastructural services, such as the water supply, sewerage, gas and electricity and tramways, as well as some health care services, educational services and leisure services. Their birth and development in terms of volume were traced in a number of cities and towns that differed from each other in their population, industrial structure, income level, level of development, and location.

Of all the variables studied, water consumption and infant mortality were the best indicators of the standard of living while daily wages were used as the best indicator of the level of income. Services were measured by their volume in relation to population and the number of people occupied in various services as a proportion of the working population.

The multiplicity of source material necessitated the use of several research methods. In categorizing cities the results of discriminant analysis were employed. Statistical data were

analyzed both by cross-tabulation and regression analysis. The incidence of services was explained with several different background variables.

The role of innovations

On the basis of the research findings it is possible to discern that the spread of innovations played a decisive role in the growth of cities. Intuitively one can assume that this must have been so. If the innovations had not spread but had only been applied in their place of origin there had not been much development and growth in the system.

When generalized at the macro level this means that the background of the rapid economic growth of Germany, can be found partly at the town level and especially in the rapidly developed and efficient system of spreading and applying innovations.

The starting point was the development of industry and technological expertise in Great Britain with which Germans first became acquainted at the Crystal Palace exhibition in London in 1851. There the Germans became aware of the significance of technology and innovations and proceeded to create systems for the diffusion and application of innovations of which the characteristics were as follows:

Civic pride and *inter-city rivalry* provided the motivational factors. Systems for the following-up and diffusion of innovations developed rapidly during the period under review. Statistical bureaux were established in the largest cities and their directors began to hold joint meetings. The value of accurate municipal statistics and comparative statistics was fully recognized. They encouraged decision-makers to take action when they realized their own city was lagging behind in comparison with others. Indeed, records of municipal statistics and other publications placed some pressure on decision-makers. *Co-operation between cities* first developed in Germany with the holding of provincial and later national meetings of Associations of Towns and Cities (Städtetage).

Of key importance in the development of German cities was, however, the body of *municipal officials* which efficiently

developed, followed-up, applied and made effective the latest innovations under the leadership of Burgomasters, who were elected to office for a period of several years and in some cases for life. For all these municipal officials the development of their own city was a matter of honour.

Some of the most legendary Burgomasters were even willing to take on huge economic risks, for example when purchasing private services, such as gas, electricity and trams, for their municipality. The concept of municipal ownership was rarely debated in Germany. Indeed, the German city can well be compared to a business enterprise under the Burgomaster's leadership. The success of the enterprise depended, nevertheless, in the long run, on well-trained municipal officials and a career in the service of a municipality became much sought after. The native bourgeoisie of the German cities were willing to invest in their own town and it soon became clear that the municipal infrastructural services proved to be rather lucrative sources of income for the cities.

Partly as a result of Germany's efficient system of diffusing and applying innovations industrialization and urbanization proceeded there at an unparalleled speed. Before long Germany was able to overtake Britain in economic growth.

In Great Britain there were regional differences in the system for the following and applying of innovations as a result of differences in municipal administration and in traditional attitudes to public ownership. The municipal administration there was based on a long tradition of using the unpaid services of elected council members. Nor was it taken for granted that municipal ownership would offer a better alternative to private ownership. At the turn of the century progressives fought, in opposition to those representing private ownership, for the idea of municipal trading. Their opponents saw in municipal ownership a frightening step towards socialism. In addition, the British colonies provided a good opportunity for the urban bourgeoisie and the middle class to make investments with satisfactory yields. The closest approximation to the German model was to be found in Scotland where forms of civic government much more resembled those of Germany.

In Nordic countries the town system had actually been based on German administrative traditions and therefore there the

issue of municipal trading raised hardly any discussion. Thus the actual process of municipalizing services was eventually completed much more quickly than had been the case in Germany itself.

It must be noted, however, that the main concern of research was with *the intermediate level* rather than with either the micro or macro levels. The examples were, however, drawn from the micro level especially where the diffusion of innovations was concerned. The conclusions and interpretations on the other hand can extend to the macro level as was indicated above when presenting an interpretation of the role of the spreading of innovations as a background factor in economic growth.

How then were these service-related innovations diffused?

The system of following-up and diffusion of innovations

The system of following-up and diffusing innovations can be seen as a learning process. At the point of departure, before the rapid growth of industrialization and urbanization, innovations were rare. Correspondingly, there was no need for any efficient follow-up to be made of other cities' achievements nor for adaptable channels to encourage the spread of what innovations there were.

When the growth of cities began to speed up and reached first the take-off stage and then the stage of accelerating growth first personal contacts were made and then study tours were undertaken. Caution typified the take-off stage. In order to reduce risks and out of a fear of making losses invited experts were often used as the planners of service developments.

In the stage of accelerating growth the follow-up and application of innovations had to take place on an ever increasing scale and at an ever increasing speed. This heightened the need to develop an efficient follow-up system. In order to meet the requirements of decision-makers new publications were forthcoming, journals were established and

handbooks compiled. Libraries were enriched by accounts of foreign experiences and the printed reports of study tours. As a result it was possible to compare cities and get information on the latest innovations. City exhibitions served the same purpose. The follow-up of new ideas became more systematic and embraced developments in several countries.

During the period of slackening growth the level was already reached where a wealth of experiences existed: many of the services that are the subject of this study had already been established while the debate over services and the follow-up of innovations had switched to the question of how to improve the quality of, for example, the water supply or the nature of special schools. Indeed, such an extensive body of experiences had been accumulated that the city could become an actual provider of information. Visitors were welcomed to the city and exhibitions were arranged. A good example of the former procedure was the exchange of visits by British Mayors and German Burgomasters in the early years of this century (1904—1912) and of the latter the Dresden city exhibition of 1903.

The picture presented above is of course a generalization, the aim of which is to modify the commonly held theoretical view of how innovations were spread. This overview has been possible because the cities that are the subject of this study were at different stages of growth even though the period being studied was relatively short for any detailed analysis. As one example, it has been possible to verify the course of development outlined above in the case of Helsinki.

Regarding the development of services in different types of cities the following findings were obtained.

The development of services and the stages of urban growth

The development of services is, first of all, clearly connected to the theoretical discussion on different stages of urban growth. The important explanatory variables were also which kind of position a service had in the hierarchy of needs of citizens or decision-makers and the time lag factor in adaption of new services.

At the take-off stage of urban growth cities normally developed their basic physical services, i.e. infrastructure for industrial needs. Municipal decision-makers recognized the possibilities offered by growth. It was at this stage that a decision had to be made on whether or not to take the road of development of services and thus of growth.

At the stage of accelerating growth the growth strategy had already been chosen; it was necessary to proceed further at an ever-accelerating speed. Farsightedness in investments came to be of great importance. At this stage there was further investment in the basic infrastructure. The growth of services was thus mainly an extension of what was already there. According to this study those cities in which the growth of population exceeded 180 per cent between 1871 and 1910 invested particularly in the establishment of water supply systems, sewerage, tramways and gas mains. Perfect examples of this were to be found among the industrial cities of the Ruhr.

In the case of most of the cities studied the stage of accelerating growth occurred in the 1880's and 1890's. The appearance of many services which take a long time to establish was delayed, for example that of services connected with schools and cultural activities. Institutions of higher education could not be set up at the same rate as general growth. Moreover they came higher in the hierarchy of needs. They were not felt to be immediately essential (cf. chapter 3).

During the stage of slackening growth the nature of service development changed completely. It was now possible to provide services satisfying needs higher in the hierarchy. Cities were in a better position to meet cultural needs once the basic infrastructure had been constructed, though it is true that new improvements in quality and new inventions repeatedly faced the decision-makers with fresh choices. A clear example of this was the debate over different methods of water filtration. Quantity was no longer the only important issue. It was now also a question of quality.

The cities could now put themselves on show and proudly display services at higher and higher levels in the hierarchy of needs. These included cultural services and other leisure time facilities (libraries, theatres, parks, swimming baths and sports grounds) as well as those catering for very young children and those at school (kindergartens, school health care, school meals

and summer camps). A new discipline, hygiene, entered the curriculum. The teaching of personal hygiene and cleanliness was now to be found in schools. Attention began to be paid to the lighting and ventilation of classrooms as well as to the school's baths and other washing facilities. Care was now expended also on the appearance and the environmental quality of the city (efforts at refuse collection and disposal, cleansing of streets, reduction of smoke pollution). Concern was now shown for the welfare of all citizens and various inspectors' posts were established (food inspectors but also inspectors of smoke, restaurants, hotels and housing).

Educational services became more varied. From the 1890's onwards the German institutes of higher education were developed to meet both industrial and municipal needs. Thus schools of economics and special institutes for training city officials were established — just to mention two examples. An indicator of the importance of educational services is the fact that during their visits English Mayors almost invariably paid a visit to some technical or commercial college in Frankfurt am Main, Cologne and Munich.

It appears therefore that cities adapted themselves to the current situation and stage of development — the model being a neighbouring city or a city in a neighbouring country that was going through an approximately similar stage.

The development of services in different types of German cities

The category of city also had an intervening effect on the basic model presented above. The applied classification of cities thus proved a useful device, for, as a result, it was possible to distinguish between individual services and groups of services.

Industrialization began in the textile cities and correspondingly they were the first to experience the process of growth. During the period under review their growth was continuously slowing down and they were the first to reach the stage of slackening growth. As a result they provided an opportunity to test whether the general model was valid in an overview of each type of city.

The situation of the *textile cities* included in this study corresponds well with the picture presented above. The question of whether they had been unprejudiced and innovative in the beginning when welcoming the rising textile industry is not the concern of this study. It was nevertheless possible to verify that they were very innovative during the period under review and among the first to adopt the latest innovations; in the case of electricity they were among the first cities to switch from gas to the new source of energy. This also met the industrial requirements, for small dressmaking workshops needed electrical machinery in order to increase their productive efficiency. But, interestingly, the textile cities were also the first ones to construct electric tramways and to establish theatres, libraries and reading rooms. Also the number of students in higher education institutes per 100,000 inhabitants remained nearly unchanged during the research period. The reason for this was partly a slackening growth rate of the textile cities.

Whether the innovativeness of these cities was a result of learning (the follow-up and application of innovations had to be learned during the process of city growth) or whether it was characteristic of these particular cities from the very beginning remains a mere matter of guesswork so far as this study is concerned.

The next wave of industrialization was linked with the growth of the *metal industry*. Of the cities under observation in this study the metal cities were the only group where the growth did not show any signs of slowing down. This stage of accelerating growth manifested itself in the vigorous development of infrastructural services (water supply) and related urban technology. In this field they were clearly ahead of other cities in services per inhabitant though in the fields of health care and education they clearly lagged behind.

Industrial cities also gave clear support to continuation schools and vocational schools.

Regional and historical differences also throw light on the incidence of services. This is made plain with cross tabulations and when the latter is investigated by regression analysis.

The cities of Eastern Germany were lagging behind the other areas in their economic development. Correspondingly the indicators of their standard of living differed from those of

these other areas. In these cities also infant mortality was high and the rate of water consumption per inhabitant was low, which was also partly due to the low rate of industrialization. The corresponding figures for the cities of North-Western Germany, the Ruhr area and South and South-Western Germany were significantly more favourable than those of Eastern and Central Germany. It is interesting also that the standard of living and the rate of development were more regionally determined than connected with the stages of urban growth. Nevertheless it is worth noting that the differences decrease towards the end of the period under review. It is indeed apparent that the interaction of cities provides the whole region, through diffusion and a multiplicative effect, with its improved standard of living.

As an indicator of *income level* this study has employed the level of daily wages in the various cities. This indicator measures mainly the wage-level of skilled workers. The industrialized cities of the Ruhr area had higher levels of daily wages than other areas. Another variable from which it is possible, indirectly, to draw conclusions on the level of income was the number of civil servants and professionals in a city. Many services, such as schools, medical and dental services required, if they were to thrive, a certain level of demand and income. The results of the regression analysis demonstrated that the number of *civil servants and professionals* was one of the most important dependent variables for explaining the number of students in higher educational institutes. The group of leisure and personal services was also greatest in cities with demand potential and a high level of income, i.e. in the *administrative and commercial cities*. Correspondingly, the proportion of the population working in the educational and cultural sectors was relatively greatest in the *administrative and garrison cities*.

Finally, *values* had a very important role to play in the background of all development. On the one hand, values were adapted to the current technological-economic situation, on the other hand they had, especially in matters of details, an actually positive effect on that situation. *Civic pride, inter-city rivalry, comparison and reference groups* were all important motivators in the follow-up and application system of innovations, as stated earlier. Identification with a certain

group of cities often in the same geographical area and the competition situation had an effect on how quickly and efficiently services were developed and on the degree of reaction to development needs.

Opinions on municipal ownership clearly reflected values. In Germany current values quickly adapted themselves to economic and technological realities. Cities were administered like independent business enterprises and the debate on municipal trading remained rather mild. In Great Britain on the other hand, that same debate became heated and seems to continue as such even today.

British and Nordic cities

Due to the centralized system of administration in German, Nordic and Scottish cities the decision-makers could influence, better than their English counterparts, the simultaneous or alternative development of several services in their cities.

The study has also demonstrated clear differences when comparing the level of services in German, English and Scottish cities. These were mainly due to the differences in administrative practice as well as to traditions. For example the tradition of philanthropy in the British Isles had a clear impact on the development of public health services. Sick people were being nursed at home and voluntary organizations also carried out a considerable amount of nursing work.

Due to their early industrialization the cities of the British Isles had already reached the stage of slackening growth and had begun to invest significantly in leisure time services, such as parks and libraries. When comparisons are made between German cities and certain cities in the United Kingdom, it is clear that as far as hospitals, parks and the construction of tramways were concerned the Scottish towns provided better services per inhabitant than the others. This can partly be explained by reference to the form of Scottish municipal administration and its active contacts with the Continent. In general, it is possible to draw the conclusion that during the period studied *national differences* within the United Kingdom may be more relevant factors in explaining the differences

between British cities and towns than differences in the level of industrialization or level of income.

The Nordic cities included in the study appeared in many respects to be able to follow the developments (in other countries): both in the establishment of services and their volume they compare favourably with the leading European cities.

In the end the development of services is connected in different ways with the municipal decision-makers' attitudes and their estimations of the need for services, as well as with their willingness to pay adequate attention to some service sectors and their ability to adopt the latest innovations.

IX	X+XI	II	III	ΔX + ΔIV	IV	ΔIV + ΔV	XIX	ΔXX + ΔXX	XXII	XXIII	Totals		
13	13	3.9	5.1	12.3	3.6	1.2	2.9	10.2	3.5	2.5	100		
14	14	6.0	10.7	14.0	6.0	1.6	0.0	18.2	7.0	3.1	100		
15	15	4.9	4.8	17.2	4.7	1.3	1.1	12.5	6.1	3.0	100		
16	16	4.9	4.8	17.2	4.7	1.3	1.1	12.5	6.1	3.0	100		
17	17	3.6	8.8	11.5	6.9	2.2	0.0	10.7	5.2	2.4	100		
18	18	3.1	3.9	12.5	3.7	1.5	0.7	10.1	4.9	3.1	100		
19	19	2.0	4.1	3.9	8.8	6.7	1.5	0.0	9.6	3.2	100		
20	20	3.1	3.1	8.8	6.7	1.5	0.0	9.6	3.2	2.9	100		
21	21	5.8	6.2	13.2	6.0	2.0	0.4	16.4	5.7	2.9	100		
22	22	4.3	3.8	10.2	4.2	0.9	2.7	10.1	1.9	1.5	100		
23	23	4.3	3.8	10.2	4.2	0.9	2.7	10.1	1.9	1.5	100		
24	24	3.9	3.8	12.6	6.5	0.7	0.6	14.1	4.8	2.5	100		
25	25	3.3	5.4	8.1	9.6	0.8	1.0	9.0	6.2	2.4	100		
26	26	4.1	4.9	15.0	5.4	2.2	0.0	11.1	5.5	4.2	100		
27	27	4.7	4.3	10.2	7.0	2.2	1.0	9.9	3.5	2.2	100		
28	28	3.1	3.5	11.2	6.7	1.6	1.3	11.4	4.1	2.3	100		
29	29	1.5	3.3	5.1	17.3	6.8	1.4	0.1	9.3	3.7	100		
30	30	2.4	3.7	8.0	5.7	1.1	5.2	8.5	3.7	1.9	100		
31	31	3.6	4.7	13.7	5.5	2.5	0.2	22.2	5.0	3.6	100		
32	32	3.2	4.0	12.9	5.5	0.5	1.6	6.9	3.6	2.4	100		
33	33	4.7	4.9	14.1	5.5	1.4	0.3	8.6	4.5	2.5	100		
34	34	4.0	5.2	11.4	7.5	1.4	1.6	11.7	4.9	2.7	100		
35	35	5.9	5.7	14.6	6.1	1.7	0.0	23.0	6.8	5.0	100		
36	36	3.6	3.8	12.6	6.7	2.1	0.1	12.3	6.4	3.5	100		
37	37	3.6	4.4	11.4	4.2	2.1	0.0	8.8	6.1	3.2	100		
38	38	1.1	4.3	8.3	6.0	1.0	0.2	9.4	5.0	2.8	100		
39	39	3.4	3.9	12.3	5.2	0.7	1.0	12.1	3.4	3.2	100		
40	40	3.3	3.3	15.0	6.7	5.2	0.0	18.2	4.2	4.9	100		
41	41	4.3	6.0	10.5	7.7	1.3	0.0	16.8	8.0	3.7	100		
42	42	4.0	5.0	12.3	5.2	1.4	1.3	15.7	5.6	2.9	100		
43	43	5.8	3.8	11.5	7.3	2.0	0.1	11.3	4.1	1.8	100		
44	44	3.5	6.0	13.0	6.8	1.7	0.1	16.7	6.3	3.4	100		
45	45	2.7	12.8	4.1	0.7	0.0	8.2	3.2	2.4	100			
46	46	1.0	2.4	8.0	5.6	1.8	0.1	7.6	3.0	2.1	100		
47	47	0.9	3.1	2.4	8.0	5.6	1.8	0.1	7.6	3.0	2.1	100	
48	48	2.1	5.0	11.4	7.6	2.9	0.0	10.8	4.1	4.5	100		
49	49	9.8	6.1	9.4	4.8	3.4	0.0	12.7	4.5	4.0	100		
50	50	3.5	5.0	16.3	5.7	1.1	0.7	11.0	3.5	2.7	100		
51	51	2.8	4.5	10.5	4.6	0.7	0.4	6.1	2.6	2.1	100		
52	52	1.1	3.9	12.3	5.1	0.9	0.7	16.5	6.0	3.0	100		
53	53	0.4	1.1	3.4	3.9	12.3	5.1	0.9	0.7	16.5	6.0	3.0	100
54	54	0.7	2.1	4.2	5.0	11.4	7.6	2.9	0.0	10.8	4.1	4.5	100
55	55	0.6	2.0	3.8	5.6	11.4	7.7	1.5	0.0	8.9	4.6	3.5	100
56	56	1.3	3.0	5.9	5.2	12.9	5.1	4.3	0.0	11.1	4.4	3.4	100
57	57	0.4	1.7	4.4	3.9	13.8	5.5	1.8	0.2	9.0	3.7	6.3	100
58	58	1.4	4.7	4.4	3.9	13.8	5.5	1.8	0.2	9.0	3.7	6.3	100
59	59	0.7	1.3	3.9	4.8	10.9	3.8	1.3	0.0	9.0	5.6	3.6	100

A = A. Agriculture, Horticulture, Animal Husbandry and Fishing

D1 = D1. Domestic Service

D2 = D2. Wage Labourers of various kinds

$\overline{\text{TF}} = \text{F}$. Independent Persons without Specified Occupations

F1 = F1. Persons with Private Means or Pensions of Income from Rented Property

E = E. Civil Servants and people in Liberal Professions

E1 = E1. Army and Navy Service

III = III. Mining, Smelting and Saltworks Industries

IV = IV. Stone and Glass Industries

V + VI = V + VI. Metal Industry (including Casting, Manufacture of Machines and Instruments, Electrical

Technology, Goldsmithing etc.)

VII = VII. Chemical Industries (including Pharmaceutical Industries, Explosives etc.)

VIII = VIII. Industries related to Forestry By-products, Lighting Materials etc.

IX = IX, Textile Industries

X = X, Paper Industries

XI = XI. Leather Industries and Industries related to Similar Materials (Rubber, Gutta-percha etc.)

XII = XII. Workers in Wood (Carpenters, Joiners, Coopers etc.)

XIII = XIII. Makers of Foodstuffs, Tobacco and Spirituous Drinks

XIV = XIV. Makers of Clothing and Footwear (Tailors, Seamstresses etc.)

XV = XV. People in Personal Services (Hairdressing, Laundry Services etc.)

XVI = XVI. Building Occupations (Contactors, B

XVII = XVII. Printing and related Occupations

XVIII = XVIII. Artistic Occupations

XIX = XIX. Unspecified Factory Owners and Workers

XX = XX, Commercial Occupations (including Banking)

[illegible]

XXIIa. Postal and Railway Services excluding Tramways

XXIIIb = XXIIIb. Other Occupations related to Communications

XXIII = XXIII. Restaurateurs and Persons in Hostelry Occupations

Sources: Statistik des Deutschen Reichs, Neue Folge, Band III, Berufsstatistik nach der allgemeinen Berufszählung vom 5. Juni 1882.

Statistik des Deutschen Reichs, Band 2. Berufsstatistik der Deutschen Großstädte. Hrsg. vom Kaiserlichen Statistischen Amt, Berlin 1884,

Statistisches Jahrbuch Deutscher Städte, Jg 1., pp. 36—39;

^a In the total sum this column is included in columns F (Independent Persons without specified occupations)

Professions)

³ Due to the rounding errors sums of the percenties do not necessarily equal to 100 per cent.

VIII	IX	X	XI	XII	XIII	XIV	XV	XVI	XVII	XVIII	XIX	XX	XXI	XXII	XXIII	Totals
0.4	13.9	0.5	0.8	3.0	5.6	9.4	1.6	5.0	0.8	0.2	0.0	10.1	0.2	2.0	1.5	2.9
0.4	1.1	0.7	1.4	4.1	9.0	9.2	2.3	5.8	0.8	0.1	0.1	18.3	0.5	2.6	3.5	3.3
0.4	13.9	1.3	0.8	3.2	5.5	6.9	1.5	5.2	1.1	0.3	0.1	9.2	0.2	2.7	0.7	3.3
0.5	36.9	2.4	0.9	3.7	3.6	6.2	0.9	7.4	1.4	0.2	0.0	8.2	0.1	1.7	1.3	2.1
0.4	1.8	1.6	1.6	4.8	4.3	15.3	2.4	7.5	1.9	0.5	0.1	13.9	0.4	2.2	2.4	4.7
0.6	2.3	0.3	1.0	5.6	8.4	8.7	2.6	7.8	1.4	0.2	0.0	17.4	0.5	2.8	4.8	3.8
0.4	2.0	0.8	1.0	4.5	5.1	15.1	2.0	7.4	1.3	0.2	0.1	12.8	0.6	3.4	2.0	3.2
0.3	3.4	0.5	1.1	3.8	8.7	7.9	2.2	8.9	1.9	0.3	0.0	11.3	0.3	2.5	1.6	2.8
0.2	1.2	0.6	1.3	4.0	3.5	8.1	2.0	6.2	1.3	0.3	1.8	11.5	0.3	3.7	1.2	3.5
0.2	17.7	1.6	0.8	3.2	3.7	7.8	1.4	10.0	1.7	0.4	0.0	10.8	0.2	3.1	0.7	3.3
0.6	2.0	0.8	1.6	4.8	6.0	9.3	1.9	8.7	1.3	0.4	0.2	13.4	0.6	4.1	2.2	3.6
0.1	30.5	1.5	0.6	3.5	3.5	11.7	1.2	4.3	1.0	0.8	0.0	11.0	0.1	1.7	0.8	2.0
0.4	0.5	0.2	0.5	3.2	4.2	8.9	1.9	5.5	0.9	0.1	0.4	10.8	0.2	1.9	2.6	3.1
0.5	0.2	0.3	0.6	3.6	5.3	5.7	1.0	12.3	0.9	0.1	1.0	9.9	0.3	4.2	1.4	3.4
0.4	1.1	1.4	1.3	4.0	5.4	9.8	1.7	10.0	1.7	0.4	0.0	10.6	0.4	3.4	2.4	4.1
0.4	3.6	1.1	1.0	4.4	4.4	6.9	1.6	10.2	1.1	0.8	0.4	10.4	0.3	2.2	1.8	2.9
0.2	21.1	2.4	1.2	3.7	3.9	9.8	1.3	8.2	1.5	0.4	0.2	12.6	0.4	2.5	1.5	3.0
0.2	1.2	0.5	1.1	2.9	4.6	13.8	1.8	6.2	1.5	0.1	0.1	9.8	0.9	5.1	0.6	2.8
0.3	0.3	0.3	0.7	3.0	3.3	5.8	1.3	12.1	1.0	0.2	0.0	9.3	0.2	2.5	1.5	3.1
0.4	0.7	0.6	1.6	3.4	4.7	10.8	2.2	6.8	1.9	0.4	0.5	18.3	0.7	3.8	2.6	4.6
0.3	0.3	0.7	1.0	3.0	5.4	9.5	2.1	5.4	0.7	0.1	0.0	7.1	0.2	3.0	0.8	2.8
0.3	7.8	0.4	1.5	5.1	4.8	10.6	2.1	8.3	0.7	0.2	0.0	9.8	0.2	2.8	1.0	3.5
0.3	0.6	0.6	0.9	3.1	6.3	7.9	2.0	7.5	1.6	0.1	0.0	11.8	0.4	4.2	1.4	4.6
0.6	0.7	0.4	1.5	3.6	4.8	8.7	2.6	7.4	1.2	0.2	0.1	23.8	0.7	2.2	6.3	4.4
0.4	1.4	1.0	3.2	3.7	3.9	8.2	2.1	10.3	2.0	0.2	0.0	11.5	0.9	3.7	1.8	4.4
0.6	0.4	0.6	1.2	3.2	5.0	7.5	2.1	5.8	1.7	0.5	0.0	8.7	0.8	5.2	1.1	3.7
0.3	0.5	0.2	0.5	2.8	3.5	5.1	1.7	8.0	0.7	0.1	0.0	9.1	0.2	1.5	2.4	3.3
0.1	0.6	0.3	0.6	3.2	3.9	9.8	1.6	6.3	0.7	0.1	0.0	12.3	0.4	2.1	1.9	3.7
0.5	4.3	3.3	1.6	3.5	4.0	9.1	1.8	6.3	5.8	0.6	0.0	15.6	0.6	3.7	1.5	4.2
0.4	0.5	0.3	0.9	4.6	6.1	7.3	1.6	7.9	1.2	0.1	0.0	17.0	0.8	2.9	3.8	3.9
0.7	0.8	0.5	1.2	3.5	7.1	8.2	2.1	5.8	1.3	0.2	0.0	13.2	1.1	4.0	2.5	3.6
0.4	0.4	0.4	2.4	5.4	4.1	8.7	2.0	4.7	1.6	0.4	0.0	12.5	0.2	2.8	2.6	3.6
0.9	1.2	1.3	1.9	3.5	6.6	8.5	2.2	6.6	1.3	0.3	0.0	16.4	1.0	4.1	4.4	4.2
0.2	0.4	0.2	0.6	2.2	2.8	8.8	2.2	5.8	0.7	0.1	0.0	6.9	0.1	2.0	1.0	2.5
0.3	26.3	0.4	0.5	3.0	2.6	5.8	1.9	6.4	0.7	1.2	0.0	7.4	0.2	1.7	1.2	2.1
0.3	0.7	0.6	1.5	4.6	6.2	8.8	1.7	9.3	1.7	0.8	0.1	11.6	0.5	3.2	1.7	5.5
0.4	0.6	1.7	1.2	8.6	6.0	7.3	1.5	6.6	3.0	0.6	0.1	11.6	0.4	3.5	1.3	3.8
0.2	0.4	0.4	0.7	3.5	5.4	14.6	2.3	6.9	1.3	0.2	0.0	11.3	0.6	2.2	1.1	3.5
0.2	0.7	0.4	1.2	2.7	4.1	7.4	1.7	5.5	0.7	0.2	0.0	6.9	0.2	1.6	2.0	2.7
1.0	0.4	0.6	0.5	3.1	5.0	11.3	2.0	8.1	1.0	0.1	0.4	16.6	1.0	2.7	5.5	3.7
0.4	0.6	0.8	1.2	3.4	4.9	7.9	2.5	6.7	1.3	0.2	0.0	8.9	0.5	3.2	1.3	3.7
0.2	1.9	1.7	1.4	5.1	5.1	9.5	2.2	8.0	3.5	0.6	0.0	11.7	0.9	3.5	1.6	3.9
0.3	0.4	0.3	1.1	3.7	3.8	9.6	2.9	6.4	1.3	0.4	0.5	10.4	0.1	1.9	2.0	6.5
0.3	0.5	0.3	0.8	4.5	4.9	7.7	2.0	5.6	1.4	0.2	0.0	10.0	0.2	5.5	1.6	4.2

A = A. Agriculture, Horticulture, Animal Husbandry and Fishing

D1 = D1. Domestic Service

D2 = D2. Wage Labourers of various kinds

F = F. Independent Persons without Specified Occupations

F1 = F1. Persons with Private Means or Pensions of Income from Rented Property

E = E. Civil Servants and people in Liberal Professions

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III = III. Mining, Smelting and Saltworks Industries

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XII = XII. Workers in Wood (Carpenters, Joiners, Coopers etc.)

XIII = XIII. Makers of Foodstuffs, Tobacco and Spirituous Drinks

XIV = XIV. Makers of Clothing and Footwear (Tailors, Seamstresses etc.)

XV = XV. People in Personal Services (Hairdressing, Laundry Services etc.)

XVI = XVI. Building Occupations (Contractors, Bricklayers etc.)

XVII = XVII. Printing and related Occupations

XVIII = XVIII. Artistic Occupations

XIX = XIX. Unspecified Factory Owners and Workers

XX = XX. Commercial Occupations (including Banking)

XXI = XXI. Insurance Occupations

XXIIa = XXIIa. Postal and Railway Services excluding Tramways

XXIIb = XXIIb. Other Occupations related to Communications

XXIII = XXIII. Restaurateurs and Persons in Hostelry Occupations

Sources: Statistik des Deutschen Reichs, Neue Folge, Band 107. Berufs- und Gewerbebeziehung vom 14. Juni 1895. Berufsstatistik der deutschen Großstädte. Erster Theil, bearbeitet im Kaiserlichen Statistischen Amt, Berlin 1897.

Statistik des Deutschen Reichs, Neue Folge, Band 109. Berufs- und Gewerbebeziehung vom 14. Juni 1895. Berufsstatistik der kleineren Verwaltungsbezirke, bearbeitet im Kaiserlichen Statistischen Amt, Berlin 1897.

Statistisches Jahrbuch Deutscher Städte, Jg. 6, pp. 352. Beiträge zur Statistik des Großherzogtums Hessen, Bd. 48, pp. 237—381.

¹ In the total sum this column is included in columns F (Independent Persons without specified occupations)² In the total sum this column is included in column E (Civil Servants and people in Liberal Professions)³ Due to the rounding errors sums of the per centages do not necessarily equal to 100 per cent.

III	XI	X	IX	II	III	ΔIX	ΔX	IX	II	III	XIX	XX	IXX	XXIIa	XXIII	XXIII	Total
0.4	15.3	0.6	2.3	2.3	5.1	6.6	1.6	5.3	1.1	0.1	0.0	10.1	0.5	2.6	1.6	2.9	100
0.5	1.4	1.4	1.0	3.7	9.2	6.7	2.0	5.8	1.0	0.1	0.1	18.2	0.5	3.6	4.1	2.9	100
0.4	12.6	1.3	0.7	2.8	4.5	5.5	1.7	5.7	1.2	0.3	0.1	9.3	0.2	3.9	1.3	3.1	100
0.7	33.2	2.2	0.9	3.5	3.0	4.4	0.9	6.4	1.6	0.2	0.0	8.2	0.2	2.4	1.7	1.7	100
0.6	1.2	1.5	1.4	4.1	4.4	13.5	2.1	6.6	2.0	0.4	0.3	14.3	0.6	2.7	2.6	4.5	100
1.0	2.2	0.3	0.8	4.1	6.2	6.0	2.5	9.1	1.2	0.2	0.1	17.3	0.5	3.1	5.2	4.0	100
0.5	1.4	0.8	0.8	3.9	4.7	13.3	2.0	7.5	1.2	0.2	0.1	12.6	0.8	3.4	2.6	3.3	100
0.4	2.9	0.5	0.8	3.0	8.2	6.5	2.2	5.2	2.0	0.3	0.0	11.9	0.5	3.2	1.5	2.5	100
0.3	2.9	0.8	1.3	3.4	4.0	6.7	1.9	7.6	1.6	0.2	0.1	10.2	0.5	5.9	1.6	2.9	100
0.2	15.5	1.4	0.7	2.5	3.2	6.3	1.4	6.4	1.3	0.2	0.0	10.0	0.3	3.1	1.4	2.8	100
0.8	1.5	0.8	1.5	3.7	5.5	7.9	1.8	8.0	1.5	0.4	0.1	14.1	0.9	5.2	3.1	3.6	100
0.3	26.2	1.2	0.6	3.1	3.6	10.2	1.3	5.8	1.3	0.7	0.0	9.8	0.2	2.5	1.5	1.6	100
0.4	0.3	0.4	0.5	2.7	4.4	7.1	1.8	7.2	0.9	0.1	0.0	11.6	0.6	3.0	2.8	2.7	100
0.5	0.3	0.3	0.6	2.5	4.3	4.9	1.2	11.3	0.8	0.1	0.3	10.5	0.6	4.5	2.1	2.9	100
0.5	1.1	1.7	1.3	3.4	7.2	7.8	1.8	5.5	2.6	0.4	0.0	11.7	0.6	3.7	2.9	4.1	100
0.7	1.6	1.0	0.9	3.7	4.2	5.7	1.6	9.1	1.4	0.5	0.1	12.6	0.5	3.1	2.6	3.4	100
0.3	16.2	2.2	1.0	2.9	3.3	8.7	1.5	7.0	1.8	0.3	0.0	12.8	0.7	3.4	1.8	2.7	100
0.3	0.8	0.6	1.1	2.5	4.2	15.4	1.5	6.7	1.8	0.1	0.0	10.5	1.3	5.7	1.2	2.6	100
0.3	0.2	0.3	0.5	2.0	2.5	4.1	0.9	10.5	1.0	0.2	0.0	9.1	0.3	2.6	1.6	2.1	100
0.5	0.6	0.7	1.9	2.8	4.7	9.4	2.4	7.0	1.8	0.3	0.1	17.4	0.8	4.8	3.0	4.4	100
0.6	0.5	1.8	0.9	5.1	6.2	9.2	1.8	5.9	1.0	0.1	0.0	7.4	0.2	4.0	1.5	2.3	100
0.3	6.5	0.5	1.3	4.3	5.0	8.0	2.1	5.8	1.1	0.2	0.2	10.4	0.4	3.3	1.8	3.1	100
0.4	0.9	1.6	0.8	2.8	6.1	6.2	2.0	7.7	1.7	0.1	0.0	11.0	0.8	5.0	2.0	3.6	100
0.6	0.6	0.4	1.5	3.3	4.9	6.5	2.2	8.1	1.4	0.2	0.1	23.5	0.9	2.3	8.1	4.5	100
0.4	0.7	1.3	4.6	2.9	4.5	7.1	2.2	7.3	2.1	0.2	0.1	13.3	1.1	4.1	1.6	3.8	100
1.2	0.6	0.5	1.1	3.0	5.0	5.7	2.1	6.2	1.9	0.3	0.0	10.1	1.2	5.8	2.0	3.9	100
0.3	0.3	0.2	0.4	2.6	3.0	4.3	1.7	11.0	0.6	0.1	0.0	8.8	0.3	1.5	2.7	3.1	100
0.4	0.5	1.0	0.5	3.3	4.7	7.5	1.8	8.0	0.8	0.1	0.2	15.1	0.7	2.6	2.6	3.3	100
0.6	3.8	3.2	1.5	2.6	3.8	7.4	1.7	6.5	6.2	0.5	0.0	15.9	0.7	3.6	2.3	3.8	100
0.3	0.3	0.3	0.6	3.9	5.9	4.9	1.7	10.1	1.2	0.1	0.0	16.6	0.8	3.2	5.5	3.3	100
0.8	1.1	0.9	1.1	2.7	6.3	7.4	2.1	5.1	1.7	0.3	0.1	14.1	1.5	4.7	2.6	2.7	100
0.6	0.4	0.4	1.3	4.7	5.1	7.1	1.8	6.7	1.6	0.2	0.0	12.4	0.6	3.7	3.4	3.6	100
1.2	1.1	1.2	3.9	3.2	5.5	5.7	1.6	7.7	1.1	0.2	0.1	13.9	1.0	4.2	4.1	4.8	100
0.2	0.2	0.2	0.5	1.8	3.4	6.3	2.1	9.1	0.8	0.1	0.0	9.3	0.2	2.7	1.7	3.6	100
0.3	24.6	0.3	0.4	2.4	2.5	4.8	1.8	7.0	0.7	0.6	0.0	8.3	0.3	2.8	1.7	2.7	100
0.4	0.6	0.6	1.3	3.7	5.2	7.4	2.1	5.8	2.3	1.0	0.2	13.7	0.8	3.6	2.2	5.4	100
0.4	0.7	1.4	1.0	6.7	4.9	5.8	1.5	7.4	2.7	0.3	0.0	10.8	0.4	3.5	1.8	3.7	100
0.2	0.2	0.4	0.6	2.6	5.5	9.9	2.1	10.9	1.1	0.2	0.0	10.9	0.8	5.1	2.1	3.2	100
0.5	0.7	0.6	1.0	1.9	4.2	6.5	1.7	7.7	1.1	0.1	0.0	7.9	0.4	2.2	2.2	2.8	100
0.8	0.7	0.7	0.4	3.1	5.5	10.6	1.8	5.3	0.8	0.1	0.1	13.4	1.0	3.0	5.3	2.9	100
0.7	0.5	0.8	1.2	2.7	6.0	7.6	2.7	6.8	1.6	0.2	0.0	11.2	0.6	4.6	2.3	4.2	100
0.5	2.5	1.7	1.3	4.2	4.8	8.4	2.5	7.7	3.0	0.4	0.0	11.5	1.7	3.6	2.3	3.9	100
0.4	0.3	0.4	1.0	2.2	4.3	8.2	2.4	8.9	1.2	0.1	0.1	11.8	0.3	2.6	2.4	8.1	100
0.3	0.5	0.4	0.7	3.2	4.9	6.9	2.3	4.9	1.9	0.3	0.1	11.3	0.3	5.9	1.5	4.2	100

A = A. Agriculture, Horticulture, Animal Husbandry and Fishing
D1 = D1. Domestic Service
D2 = D2. Wage Labourers of various kinds
F = F. Independent Persons without Specified Occupations
F1 = F1. Persons with Private Means or Pensions of Income from Rented Property
E = E. Civil Servants and people in Liberal Professions
E1 = E1. Army and Navy Service
III = III. Mining, Smelting and Saltworks Industries
IV = IV. Stone and Glass Industries
V+VI = V+VI. Metal Industry (including Casting, Manufacture of Machines and Instruments, Electrical Technology, Goldsmithing etc.)
VII = VII. Chemical Industries (including Pharmaceutical Industries, Explosives etc.)
VIII = VIII. Industries related to Forestry By-products, Lighting Materials etc.
IX = IX. Textile Industries
X = X. Paper Industries
XI = XI. Leather Industries and Industries related to Similar Materials (Rubber, Gutta-percha etc.)
XII = XII. Workers in Wood (Carpenters, Joiners, Coopers etc.)
XIII = XIII. Makers of Foodstuffs, Tobacco and Spirituous Drinks
XIV = XIV. Makers of Clothing and Footwear (Tailors, Seamstresses etc.)
XV = XV. People in Personal Services (Hairdressing, Laundry Services etc.)
XVI = XVI. Building Occupations (Contractors, Bricklayers etc.)
XVII = XVII. Printing and related Occupations
XVIII = XVIII. Artistic Occupations
XIX = XIX. Unspecified Factory Owners and Workers
XX = XX. Commercial Occupations (including Banking)
XXI = XXI. Insurance Occupations
XXIIa = XXIIa. Postal and Railway Services excluding Tramways
XXIIb = XXIIb. Other Occupations related to Communications
XXIII = XXIII. Restaurateurs and Persons in Hostelry Occupations

Sources: Statistik des Deutschen Reichs, Neue Folge, Band 107. Berufs- und Gewerbebeziehung vom 14. Juni 1895. Berufsstatistik der deutschen Großstädte. Erster Teil, bearbeitet im Kaiserlichen Statistischen Amt, Berlin 1897.
Statistik des Deutschen Reichs, Neue Folge, Band 109. Berufs- und Gewerbebeziehung vom 14. Juni 1895. Berufsstatistik der kleineren Verwaltungsbezirke, bearbeitet im Kaiserlichen Statistischen Amt, Berlin 1897.
Statistisches Jahrbuch Deutscher Städte, Jg. 6, pp. 352. Beiträge zur Statistik des Großherzogtums Hessen, Bd. 48, pp. 237—381.

¹ In the total sum this column is included in columns F (Independent Persons without specified occupations)
² In the total sum this column is included in column E (Civil Servants and people in Liberal Professions)
³ Due to the rounding errors sums of the percentiles do not necessarily equal to 100 per cent.

Appendix II

Discriminant analysis for classification of German cities

Discriminant analysis was used in forming the grouping of towns and cities. Of the tested variables six were selected for the final analysis which provided five canonical discriminant functions. The standardized canonical function coefficients are given below in Table A. The rotated standardized discriminant function coefficients (Varimax rotation) are given below in Table B.

The discriminatory effectiveness of the functions is indicated by the Wilks' lambda and chi-square values. The corresponding degrees of freedom are also given in the table. The chi-square values are significant at the .001 level for the first four discriminant functions.

It can be concluded that the functions are discriminatorily effective. The rotated functions show that there are grounds for grouping the cities into textile industry, garrison, commerce and metal industry cities. Function 1 obtains the highest value for the number of persons employed in the textile industry, function 2 for those in the military, function 3 for persons in mining, engineering and metal industry and function 4 for persons employed in commerce of total employment.

The results of the discriminant analysis support the classification of the towns and cities into four groups (textile industry, garrison, metal industry and commercial cities). On the other hand the 1907 occupation census data are not sufficient for differentiating between administrative and regional centres. For this purpose data on the historical development of the cities must be used.

Table A.
Standardized canonical discriminant function coefficients

	Discriminant functions				
	F1	F2	F3	F4	F5
Persons in:					
1 Textile industries	.80	.62	.12	.57	.08
2 Military service	-.58	.51	.32	.55	.37
3 Metal, engineering and mining industries	.23	-.21	.83	.16	.31
4 Commercial occupations, communications	.67	-.34	-.17	.97	.58
5 Persons with private means or pensions or income from rented property	.08	.18	-.59	-.28	1.10
6 Civil servants and persons in liberal professions from the total employment	.11	.04	.30	.15	-1.25

Table B.
Rotated standardized discriminant function coefficients

	Discriminant functions				
	F1	F2	F3	F4	F5
Persons in:					
1 Textile industries	1.15	.11	.07	.18	-.04
2 Military service	.08	1.06	.06	.12	.08
3 Metal, engineering and mining industries	.14	.15	.92	.14	-.05
4 Commercial occupations, communications	.25	.24	.11	1.11	.27
5 Persons with private means or pensions or income from rented property	.07	.00	-.17	.07	1.28
6 Civil servants and persons in liberal professions from the total employment	.14	-.19	-.14	-.24	-1.25
Wilks' lambda	.01	.03	.14	.42	.87
Chi- squared	191.2	127.0	73.3	31.7	5.0
Degrees of freedom	30	20	12	6	2
Significance	.0000	.0000	.0000	.0000	.0825

Appendix III

Population of 44 German cities from 1871 to 1910 according to census results.

City	Number of inhabitants in 1871	Number of inhabitants in 1880	Number of inhabitants in 1890	Number of inhabitants in 1900	Number of inhabitants in 1910
Aachen	74,146	85,551	103,470	135,245	156,143
Altona	74,102	91,047	143,249	161,501	172,628
Augsburg	51,220	61,408	75,629	89,170	102,487
Barmen	74,449	95,941	116,144	141,944	169,214
Berlin	826,341	1,122,330	1,578,794	1,888,848	2,071,257
Bremen	82,807	112,453	125,684	163,297	247,437
Breslau	207,997	272,912	335,186	442,709	512,105
Brunswick	57,883	75,038	101,047	128,226	143,552
Cassel	46,362	58,290	72,020	106,034	153,196
Chemnitz	68,229	95,123	138,954	206,913	287,807
Cologne	129,233	144,772	281,681	372,529	516,527
Crefeld	57,105	73,872	105,371	107,046	129,406
Danzig	88,975	108,551	120,338	140,563	170,337
Dortmund	44,420	66,544	89,663	142,733	214,226
Dresden	177,089	220,818	276,522	396,146	548,308
Düsseldorf	69,365	95,458	144,642	213,711	358,728
Elberfeld	71,384	93,538	125,899	156,923	170,195
Erfurt	43,616	53,254	72,360	85,202	111,463
Essen	51,513	56,944	78,706	118,862	294,653
Frankfurt a.M.	91,040	136,831	180,020	288,989	414,576
Frankfurt a.O.	43,214	51,147	55,738	61,852	68,277
Görlitz	42,200	50,307	61,135	80,931	85,806
Halle	52,620	71,484	101,401	156,611	180,843
Hamburg	239,107	410,127	569,260	705,738	931,035
Hanover	87,626	122,843	163,593	235,649	302,375
Karlsruhe	36,582	49,998	73,684	97,185	134,313
Kiel	31,764	43,594	69,172	107,977	211,627
Königsberg	112,152	140,909	161,666	189,483	245,994
Leipzig	106,925	149,081	295,025	456,126	589,850
Lübeck	39,743	51,055	63,590	82,098	98,656
Magdeburg	84,401	97,539	202,234	229,667	279,629
Mainz	53,282	61,328	72,059	84,251	110,634
Mannheim	39,606	53,465	79,058	141,147	193,902
Metz	50,617 ¹	53,131	60,186	58,462	68,598
Mulhouse	53,580 ²	63,629	76,892	89,118	95,041
Munich	169,693	230,023	349,024	499,932	596,467
Nuremberg	83,214	99,519	142,590	261,081	333,142
Posen	56,372	64,544	69,627	117,033	156,691
Potsdam	43,901	48,447	54,125	59,796	62,243
Stettin	76,280	91,745	116,228	210,702	236,113
Strasbourg	85,654	104,471	123,500	151,041	178,891
Stuttgart	91,623	117,303	139,817	176,699	286,218
Wiesbaden	35,450	50,238	64,670	86,111	109,002
Würzburg	40,005	51,014	61,039	75,499	84,496

Sources: Statistik des Deutschen Reichs, Neue Folge, Band 451, Heft 1. Volks-, Berufs- und Betriebszählung vom 16. Juni 1933. Stand, Entwicklung, und Siedlungsweise der Bevölkerung des Deutschen Reichs, bearbeitet im Statistischen Reichsam, Berlin 1935, pp. 35—37.

Statistisches Jahrbuch Deutscher Städte, Jg. 1, p. 23; Jg. 3, p. 270; Jg. 10, p. 93; Jg. 11, p. 108, 145; Jg. 19, pp. 846—847.

Silbergleit, Heinrich (ed.), Preussens Städte. Denkschrift zum 100 jährigen Jubiläum der Städteordnung vom 19. November 1808, Berlin 1908, Tabellen, pp. 2—7.

1 Mean population in 1872

2 Mean population in 1871

Appendix IV

Percentile growth of population per decade in 44 German cities from 1871 to 1910.

City	Percentile growth of population per decade				
	1871-1880	1880-1890	1890-1900	1900-1910	1871-1910
Aachen	15.38	20.95	30.71	15.45	110.59
Altona	22.87	57.34	12.74	6.89	132.96
Augsburg	19.89	23.16	17.91	14.93	100.09
Barmen	28.87	21.06	22.21	19.21	127.29
Berlin	35.82	40.67	19.64	9.66	150.65
Bremen	35.80	11.77	29.93	51.53	198.81
Breslau	31.21	22.82	32.08	15.68	146.21
Brunswick	29.64	34.66	26.90	11.95	148.00
Cassel	25.73	23.56	47.23	44.48	230.43
Chemnitz	39.42	46.08	48.91	39.10	321.83
Cologne	12.02	94.57	32.25	38.65	299.69
Crefeld	29.36	42.64	1.59	20.89	126.61
Danzig	22.00	10.86	16.81	21.18	91.44
Dortmund	49.81	34.74	59.19	50.09	382.27
Dresden	24.69	25.23	43.26	38.41	209.62
Düsseldorf	37.62	51.52	47.75	67.86	417.16
Elberfeld	31.04	34.60	24.64	8.46	138.42
Erfurt	22.10	35.88	17.75	30.82	155.56
Essen	10.54	38.22	51.02	147.90	472.00
Frankfurt a.M.	50.30	31.56	60.53	43.46	355.38
Frankfurt a.O.	18.36	8.98	10.97	10.39	58.00
Görlitz	19.21	21.52	32.38	6.02	103.33
Halle	35.85	41.85	54.45	15.47	243.68
Hamburg	71.52	38.80	23.98	31.92	289.38
Hanover	40.19	33.17	44.05	28.32	245.08
Karlsruhe	36.67	47.37	31.89	38.20	267.16
Kiel	37.24	58.67	56.10	95.99	566.25
Königsberg	25.64	14.73	17.21	29.82	119.34
Leipzig	39.43	97.90	54.61	29.31	451.65
Lübeck	28.46	24.55	29.11	20.17	148.24
Magdeburg	15.57	107.34	13.55	21.78	231.31
Mainz	15.10	17.50	16.92	31.32	107.64
Mannheim	34.99	47.87	78.54	37.38	389.58
Metz	4.97 ¹	13.28	-2.86	17.34	35.52
Mulhouse	18.76 ²	20.84	15.90	6.65	77.38
Munich	35.55	51.73	43.24	19.31	251.50
Nuremberg	19.59	43.28	83.10	27.60	300.34
Posen	14.49	7.88	68.09	33.89	177.95
Potsdam	10.36	11.72	10.48	4.09	41.78
Stettin	20.27	26.69	81.28	12.06	209.54
Strasbourg	21.97	18.22	22.30	18.44	108.85
Stuttgart	28.03	19.19	26.38	61.98	212.39
Wiesbaden	41.72	28.73	33.15	26.58	207.48
Würzburg	27.52	19.65	23.69	11.92	111.21

Sources: Calculated on the basis of Appendix III.

1 Starting point mean population 1872

2 Starting point mean population 1871

Appendix V.

Population of the 16 principal towns in the United Kingdom as shown in the census in the year concerned and their growth rates.

	Population in thousands						Growth rates of the town per cent						Growth rates of the town per cent		
	1801	1821	1851	1871	1881	1891	1901	1911	1871-1881	1881-1891	1891-1901	1901-1911	1871-1881	1881-1891	1891-1901
England:															
London ¹ :															
Birmingham ²	959	1,380	2,363	3,261	3,830	4,228	4,536	4,522	17.4	10.4	7.3	-0.3	38.7	371.5	146.4
Bristol	71	102	233	344	401	478	522	526	32.6	16.6	19.2	9.2	0.8	640.8	228.2
Leeds	61	85	137	183	207	222	329	357	33.1	13.1	7.2	48.2	8.5	485.2	124.6
Liverpool ³	53	84	172	259	309	368	429	446	19.3	19.1	16.6	4.0	72.2	741.5	224.5
Manchester ⁴	82	138	376	493	553	518	685	746	12.2	-6.3	32.2	8.9	51.3	809.7	358.5
Newcastle-upon-Tyne	75	126	303	351	341	505	544	714	-2.8	48.1	7.7	31.3	103.4	852.0	304.0
Sheffield	33	42	88	128	145	186	215	267	13.3	28.2	15.6	24.2	108.6	709.1	166.7
Scotland:	46	65	135	240	285	324	381	455	18.8	13.7	17.6	19.4	89.6	889.1	193.5
Aberdeen	27	44	72	88	105	125	154	164	19.3	19.0	23.2	6.5	86.4	507.4	166.7
Dundee	26	31	79	119	140	154	161	165	17.6	10.0	4.5	2.5	38.7	534.6	203.8
Edinburgh	83	138	194	242	295	332	394	401	21.9	12.5	18.7	1.8	65.7	383.1	133.7
Glasgow ⁵	77	147	345	522	587	658	762	784	12.5	12.1	15.8	2.9	50.2	918.2	348.0
Wales:															
Cardiff	2	4	18	40	83	129	164	182	107.5	55.4	27.1	11.0	355.0	900.0	800.0
Swansea	10	15	31	52	66	91	95	115	26.9	4.4	4.4	21.1	121.2	1050.0	210.0
Ireland:															
Belfast	...	37	87	174	208	256	349	387	19.5	23.1	36.3	10.9	122.4	945.9	135.1
Dublin ⁶	336	405	405	405	419	419	448	477	3.5	0.0	6.9	6.5	17.8	42.0	20.5

Source: Mitchell, B. R. and Deane, P. Abstract of British Historical Statistics, Cambridge 1962, pp. 20-27.

¹ The population of the County of London is for the present area throughout. It has been deducted from the counties previously forming part.

² The parishes or townships of Aston, Handsworth, King's Norton, Northfield and Yardley (except such parts as were already incorporated in Birmingham) — i.e. an area which at the end of the nineteenth century comprised Aston Manor county borough, Erdington, Handsworth, King's Norton, and Northfield urban districts, and Yardley rural district. A part of the area was incorporated in Birmingham between 1881 and 1891, and the remainder between 1911 and 1921.

³ The parishes of West Derby, Toxteth Park, Walton-on-the-Hill, and Wavertree (except such parts as were already incorporated in Liverpool). The whole of this area was incorporated into the city between 1891 and 1901.

⁴ The parishes of Blackley, Harpurhey, Crumpsall, Bradford, Moston, Newton, Openshaw, and Rusholme, all of which were incorporated in Manchester between 1881 and 1891. The parishes of Moss Side, Gorton, Levenshulme, and Withington (except such parts as were already incorporated into Manchester). A part of this area was incorporated in the city between 1881 and 1891 and the remainder between 1901 and 1911.

⁵ The principal transfers of population resulting from boundary changes were as follows: the Burghs of Govan, Partick and Pollokshaws were incorporated into Glasgow between 1911 and 1921.

⁶ Statistics for the county of Dublin.

Appendix VI

Data on population and occupations of Helsinki and Stockholm
1860—1920.

Table A.

Population of Stockholm and Helsinki according to census
results from 1860—1920.

Year	Stockholm	Helsinki
1860	112,391	22,228 ¹
1870	136,016	32,113
1880	168,775	43,142
1890	246,454	65,535
1900	300,624	93,217
1910	342,323	133,150
1920	419,440	184,076

Table B.

Percentile growth of population in Stockholm and Helsinki per
decade from 1860—1920.

Decade	Stockholm	Helsinki
1860—1870	21.0	44.5
1870—1880	24.1	34.3
1880—1890	46.0	51.9
1890—1900	22.0	42.2
1900—1910	13.9	42.8
1910—1920	22.5	38.2

Sources: Historisk Statistik för Sverige, I, Befolkning 1720—1950, Stockholm 1955, tab A 12, tab A 4; Statistical Yearbook of Finland 1909, Helsinki 1909, p. 10; 1939, Helsinki 1939, Table 10.

¹ Population in parish registers

Table C.

Percentile distribution of persons employed in various occupations in Helsinki and Stockholm 1870—1910.

	1870		1880		1890		1900		1910	
	Hki	Sthlm	Hki	Sthlm	Hki	Sthlm	Hki	Sthlm	Hki	Sthlm
Agriculture and related occupations	0.9	1.0	1.8	0.8	0.8	0.8	1.3	0.5	0.6	0.5
Industry and handicrafts	22.7	31.1	26.8	35.1	30.4	37.0	26.8	37.2	29.9	37.6
Transport and communications	3.8	3.9	6.2	4.3	5.1	5.1	5.7	7.1	7.0	8.2
Commerce	4.7	9.2	5.9	11.3	7.5	13.3	10.6	15.5	10.4	22.2
Civil servants:										
Administration, defence	29.5	11.8	19.1	8.9	13.2	8.1	9.6	7.4	2.9	6.5
Other civil servants and liberal professions	6.7	3.9	5.9	3.8	7.5	4.3	6.4 ¹	4.9	9.5 ²	5.9
Household service	23.6	28.3	16.6	25.4	16.4	19.0	20.2	17.0	11.9	14.8
Labourers, unspecified	8.1	10.8	17.7	10.4	19.1	12.4	19.4 ³	10.4	27.8 ³	4.3
Total	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %
	14,499	56,661	21,160	77,780	31,825	108,441	46,892	139,236	66,912	172,497

Sources: Ingrid Hammarström, Stockholm i svensk ekonomi, Stockholm 1970, pp. 12—13; Gösta Ahlberg, Stockholms befolkningsutveckling efter 1850, Stockholm 1958, pp. 169—173. Statistisk årsbok för Helsingfors 1939, tabell 33, p. 32; Befolkning efter näringsgren kommunvis åren 1880—1975, Statistiska meddelanden Nr 63, statistikcentralen, Helsingfors 1979.

1 Street cleaning and related occupations missing in data for 1900.

2 No census data on military personnel in garrisons and on warships.

3 In 1900 and especially in 1910 the group 'unspecified' included a number of persons which should have been classified elsewhere. Civil servants and others employed by the railways and the postal and telegraph service etc. were grouped as Civil servants from 1870 to 1890 but later under 'Transport and communications'.

Hki = Helsinki

Sthlm = Stockholm

Table D.
Population of Helsinki employed in occupations according to the 1910 census. Classification according to the German occupations census as far as possible.

	A	D1	D2	F	F1	E	E1	III	IV
Employees	362	3,107	8,518	12,002	1,826	9,339	434	0	514
Per cent of total employment	0.5	4.4	12.0	16.9	2.6	13.2	0.6	0.0	0.7
<hr/>									
	V + VI	VII + VIII	IX	X	XI	XII	XIII	XIV	XV
Employees	3,413	278	555	839	121	970	2,948	4,720	2,668
Per cent of total employment	4.8	0.4	0.8	1.2	0.2	1.4	4.2	6.7	3.8
<hr/>									
	XVI	XVII	XVIII	XIX	XX	XXI	XXIIa	XXIIb	XXIII
Employees	4,253	1,569	0	1,225	5,913	78	1,889	2,797	1,349
Per cent of total employment	6.0	2.2	0.0	1.7	8.3	0.1	2.7	3.9	1.9
<hr/>									
Others	Total								
Employees	1,537	70,964							
Per cent of total employment	2.2	100.2							

Source: Calculated on the basis of Census of Helsinki in 1910.

Headings — see Appendix I.

Appendix VII

Loans for municipal enterprises in 1912 (marks/inhabitant) in German cities according to the applied classification.

	Commer- cial Cities	Adminis- trative Cities	Metal Industry Cities	Textile Industry Cities	Garrison Cities	Regional Centres	On Average	Tail prob- ability	(N) ¹
Loans taken out for municipal enterprises in marks/inhabitant	1912	208.25	143.40	164.50	184.60	142.33	154.51	0.374	(37)

Source: Calculated on the basis of Statistisches Jahrbuch Deutscher Städte, Jg. 20, pp. 86—87; Jg. 21, pp. 642—645.

Applied classification:

Commercial Cities: Altona, Bremen, Cologne, Frankfurt a.M., Hamburg, Leipzig, Lübeck

Administrative Cities: Berlin, Brunswick, Breslau, Cassel, Dresden, Hanover, Karlsruhe, Königsberg, Magdeburg, Munich, Strasbourg, Stuttgart

Metal Industry and Mining Cities: Chemnitz, Dortmund, Düsseldorf, Essen, Mannheim, Nuremberg

Textile Industry Cities: Aachen, Augsburg, Barmen, Crefeld, Elberfeld, Mulhouse

Garrison Cities: Kiel, Mainz, Metz, Potsdam

Regional Centres: Danzig, Erfurt, Frankfurt a.O., Görlitz, Halle, Posen, Stettin, Wiesbaden, Würzburg

Loans for municipal enterprises in 1912 (marks/inhabitant) in German cities grouped according to geographical location.

	In the Ruhr area	In Southern and South- Western Germany	In North- Western Germany	In Central Germany	In Eastern Germany	On Average	Tail probability	(N) ¹
Loans taken out for municipal enterprises in marks/ inhabitant	188.00	185.92	109.33	117.00	119.29	154.51	0.024	(37)

Sources: Calculated on the basis of Statistisches Jahrbuch Deutscher Städte, Jg. 20, pp. 86—87; Jg. 21, pp. 642—645.

Geographical location of the city:

In the Ruhr area: Aachen, Barmen, Cologne, Crefeld, Dortmund, Düsseldorf, Elberfeld, Essen

In Southern and South-Western Germany: Augsburg, Frankfurt a.M., Karlsruhe, Mainz, Mannheim, Metz, Mulhouse, Munich, Nuremberg, Strasbourg, Stuttgart, Wiesbaden, Würzburg

In North-Western Germany: Altona, Brunswick, Bremen, Cassel, Hamburg, Hanover, Kiel, Lübeck

In Central Germany: Berlin, Chemnitz, Dresden, Erfurt, Halle, Leipzig, Magdeburg, Potsdam

In Eastern Germany: Breslau, Danzig, Frankfurt a.O., Görlitz, Königsberg, Posen, Stettin

1 Missing: Bremen, Cassel, Hamburg, Kiel, Lübeck, Magdeburg, Mulhouse

Appendix VIII

Water consumption per inhabitant (litres/day) in 44 German cities in 1890, 1896, 1900, 1905, 1910 and 1912.

	1890	1896	1900	1905	1910	1912
Aachen	40.0	66.6	77.9	81.4	88.6	88.3
Altona	88.3	125.5	121.8	127.9	150.1	145.8
Augsburg	214.1	238.5	249.7	257.1	239.8	265.2
Barmen	105.3	146.6	183.5	136.3	174.3	162.9
Berlin	63.1	77.9	79.1	82.8	88.6	92.4
Bremen	69.9	85.3	96.4	124.1	154.3	121.0
Breslau	77.7	99.9	83.7	82.8	86.3	98.4
Brunswick	70.3	72.3	78.3	77.3	87.4	89.8
Cassel	45.0	83.5	79.1	85.7	91.3	97.3
Chemnitz	41.2	40.3	40.8	44.3	49.0	52.6
Cologne	159.2	104.3	121.6	127.7	138.6	150.6
Crefeld	64.4	101.5	130.0	129.3	135.8	126.3
Danzig	88.4	..	77.1	71.6	88.1	73.1
Dortmund	177.7	222.5	240.9	241.9	247.8	238.5
Dresden	80.2	91.2	99.9	95.6	100.9	110.9
Düsseldorf	85.0	87.6	102.7	136.8	136.6	142.7
Elberfeld	91.9	..	106.9	106.7	143.5	158.4
Erfurt	47.4	52.1	62.8	59.3	96.1	78.9
Essen	125.3	114.3	144.9	143.9	148.8	189.6
Frankfurt a.M.	129.1	142.8	168.4	151.6	157.4	163.5
Frankfurt a.O.	42.2	55.3	..	..	..	117.9
Görlitz	57.8	69.7	69.4	60.7	65.5	80.2
Halle	76.5	80.7	77.9	77.4	77.4	82.0
Hamburg	228.8	188.1	173.4	163.3	138.9	139.4
Hannover	75.2	60.1	89.3	101.6	93.3	119.8
Karlsruhe	111.8	139.5	124.5	119.9	120.3	125.4
Kiel	75.7	69.8	63.0	72.5	67.0	65.5
Königsberg	53.9	64.8	66.9	78.0	75.5	72.9
Leipzig	94.9	58.2	66.0	69.8	69.5	70.9
Lübeck	188.6	234.5	240.8	181.3	153.1	138.5
Magdeburg	96.5	90.0	88.5	95.4	98.0	98.1
Mainz	28.9	46.6	48.0	62.8	67.8	72.1
Mannheim	45.2	75.9	84.9	80.9	95.8	107.7
Metz	114.2	131.2	122.0	137.8	186.5	207.0
Mulhouse	..	..	..	116.0	120.5	115.7
Munich	97.0	184.2	199.5	212.5	225.0	229.4
Nuremberg	67.3	78.5	75.2	77.3	86.6	91.1
Posen	46.6	67.5	50.9	73.9	81.9	91.2
Potsdam	23.5	44.1	56.5	65.5	69.0	79.0
Stettin	..	70.4	68.3	72.1	63.6	64.7
Strasbourg	47.9	60.9	89.3	113.9	119.8	115.3
Stuttgart	77.8	93.3	94.2	101.4	99.5	103.6
Wiesbaden	77.5	89.7	97.0	108.5	115.7	125.4
Würzburg	137.7	..	207.9	229.0	211.9	203.7
On average	88.8	100.1	109.5	112.5	118.7	121.9

Sources: Statistisches Jahrbuch Deutscher Städte, Jg. 2, pp. 90—91; Jg. 7, pp. 77, 81; Jg. 11, pp. 466—467; Jg. 15, p. 535; Jg. 19, pp. 574—577; Jg. 21, pp. 435—437.

Appendix IX

Models for step-wise regression analysis.

The numbers given in parentheses below the regression coefficients are t-values. The standard errors of regression coefficients can be established by dividing the coefficient with the t-value.

Model 1.

(N=44)

Dependent variable	independent variables	Regression coefficient (t-value)	R ²
Consumption of water per inhabitant 1912 (litres/day)			.30
	geographical location of the city in the eastern part in Germany (dummy variable, west=0, east=1)	- 57.15 (- 4.26)	
	constant term	141.36	

Model 2.

(N=44)

Dependent variable	independent variables	Regression coefficient (t-value)	R ²
Consumption of water per inhabitant 1912 (litres/day)			.33
	location of the city in the Ruhr area	62.37 (3.65)	
	location of the city in Southern and South- Western Germany	53.29 (3.69)	
	constant term	94.80	

Model 3.

(N=40)

Dependent variable	independent variables	Regression coefficient (t-value)	R ²
Consumption of gas per inhabitant 1912 (m ³ /yr)			.34
	daily wages 1912	29.63 (2.46)	
	number of inhabitants in 1910	0.02 (2.29)	
	constant term	2.22	

Model 4.

(N=44)

Dependent variable	independent variables	Regression coefficient (t-value)	R ²
Consumption of electricity (kWh/inhabitant per year) in 1911			.52
	number of inhabitants in 1910	0.04 (2.65)	
	location of the city in Southern or South- Western Germany	24.33 (2.45)	
	city classified as a textile industry city	79.95 (6.03)	
	constant term	26.19	

Model 5.

(N=44)

Dependent variable	independent variables	Regression coefficient (t-value)	R2
Infant mortality in 1910			.45
	proportion of persons working in metal industry from total employment in 1907	0.20 (2.97)	
	location of the city in Southern or South-Western Germany	2.20 (2.74)	
	location of the city in Eastern Germany	5.53 (5.45)	
	constant term	11.28	

Model 6.

(N=44)

Dependent variable	independent variables	Regression coefficient (t-value)	R2
Doctors per 100,000 inhabitants in 1909			.60
	proportion of persons with private means or pensions or income from rented property from total employment in 1907	4.26 (2.59)	
	proportion of civil servants and persons in liberal professions from total employment in 1907	10.19 (2.97)	
	location of the city in Southern or South-Western Germany	19.59 (2.55)	
	constant term	- 30.29	

Model 7.

(N=44)

Dependent variable	independent variables	Regression coefficient (t-value)	R ²
Dentists per 100,000 inhabitants in 1909			.57
	proportion of civil servants and persons in liberal professions from total employment in 1907	2.22 (7.13)	
	number of inhabitants in 1910	0.003 (2.36)	
	constant term	- 3.88	

Model 8.

(N=44)

Dependent variable	independent variables	Regression coefficient (t-value)	R ²
Number of beds in hospitals per 1 000 inhabitants in 1912			.45
	proportion of civil servants and persons in liberal professions from total employment in 1907	1.09 (5.14)	
	daily wages in 1912	- 2.15 (- 2.85)	
	constant term	7.84	

Model 9.

Dependent variable	independent variables	Regression coefficient (t-value)	R ²
Number of students in higher education per 1 000 inhabitants in 1910			.57
	proportion of civil servants and persons in liberal professions from total employment in 1907	1.71 (3.17)	
	growth-rate of the number of inhabitants 1871—1910	— 0.02 (— 4.31)	
	location of the city in Southern or South-Western Germany	4.01 (2.76)	
	constant term	14.10	

Model 10.

(N=44)

Dependent variable	independent variables	Regression coefficient (t-value)	R ²
Proportion of persons working in personal services (hairdressing, laundry services etc.) from total employment in 1907			.51
	proportion of tradesmen from total employment in 1907	0.04 (2.88)	
	proportion of civil servants and persons in liberal professions from total employment in 1907	0.19 (5.53)	
	constant term	0.22	

Model 11.

(N=44)

Dependent variable	independent variables	Regression coefficient (t-value)	R ²
Proportion of persons working in personal services (hairdressing, laundry services etc) from total employment in 1907			.71
	city classified as a metal industry city	- 0.51 (- 4.18)	
	proportion of tradesmen from total employment in 1907	0.03 (2.48)	
	city classified as a textile industry city	- 0.39 (- 3.20)	
	location of the city in Southern or South-Western Germany	0.30 (3.74)	
	proportion of civil servants and persons in liberal professions from total employment in 1907	0.06 (1.75)	
	constant term	1.15	

Appendix X

Infant mortality¹ in 16 principal towns in the United Kingdom in 1911 and 1912 and rates of wages in 1912.²

City	Infant mortality		Rates of wages in 1912
	1911	1912	
London	130	91	100
Birmingham	172	112	93
Liverpool	155	125	92
Manchester	156	123	90
Sheffield	140	106	90
Leeds	159	103	91
Bristol	141	103	87
Newcastle	137	102	90
Cardiff	134	111	89
Swansea	137	101	87
Glasgow	137	123	88
Edinburgh	114	109	86
Dundee	157	161	85
Aberdeen	139	127	81
Belfast	128	129	80
Dublin	165	147	78

Source: Births, Deaths and Natural increase 1912, Comparative Municipal Statistics, Vol. I, 1912—13, table 13, pp. 18—19.

Cost of Living of the Working Classes, Report of an Enquiry by the Board of Trade into Working Class, Rents and Retail Prices together with the Rates of wages in certain occupations in industrial towns of the UK in 1912 (presented to both Houses of Parliament 1913).

1 deaths under one year per 1,000 births.

2 rates of wages in building, engineering and printing. Figures showing comparison with London.

Appendix XI

Infant mortality¹ in 44 German cities in 1910, 1911 and 1912.

	1910	1911	1912
Aachen	152	241	136
Altona	159	199	161
Augsburg	206	249	178
Barmen	91	112	101
Berlin	157	173	142
Bremen	126	135	120
Breslau	188	207	163
Brunswick	135	180	140
Cassel	99	141	94
Chemnitz	192	284	171
Cologne	154	234	152
Crefeld	122	174	103
Danzig	184	205	164
Dortmund	146	195	145
Dresden	129	166	116
Düsseldorf	129	180	125
Elberfeld	90	138	99
Erfurt	140	238	135
Essen	171	169	116
Frankfurt a.M.	118	124	102
Frankfurt a.O.	190	217	190
Görlitz	181	208	135
Halle	167	237	160
Hamburg	149	158	130
Hanover	109	149	112
Karlsruhe	167	182	144
Kiel	138	165	109
Königsberg	170	170	169
Leipzig	150	242	133
Lübeck	148	159	132
Magdeburg	128	232	168
Mainz	135	134	121
Mannheim	162	185	151
Metz	189	243	140
Mulhouse	153	203	144
Munich	166	176	134
Nuremberg	182	204	156
Posen	171	190	182
Potsdam	143	173	135
Stettin	219	243	175
Strasbourg	156	168	131
Stuttgart	144	150	133
Wiesbaden	101	119	95
Würzburg	147	165	148
On average	151	187	138

Sources: Statistisches Jahrbuch Deutscher Städte, Jg. 19, pp. 67—68; Jg. 20, pp. 70—71; Jg. 21, pp. 76—77.

¹ deaths under one year per 1,000 births.

Appendix XII

Hospitals under public management and not under public management in the 16 principal towns in England, Wales, Scotland and Ireland in 1912.

	Hospitals under public and not under public management	Beds in hospi- tals under public and not under public management	Beds in hospi- tals not under public management	Beds in hos- pitals not under public management/ 1,000 inhabit.	Beds in hos- pitals un- der public management	Beds in hos- pitals under public management /1,000 inhabit.
London	111	19,121	10,915	2.4	8,206	1.8
Birmingham	16	1,799	998	1.2	801	0.9
Liverpool	23	2,493	1,323	1.8	1,170	1.6
Manchester	20	2,463	1,793	2.5	670	0.9
Sheffield	8	1,255	693	1.5	562	1.2
Leeds	7	1,430	741	1.7	689	1.5
Bristol	12	938	769	2.1	169	0.5
Newcastle	15	1,176	832	3.1	344	1.3
Cardiff	3	481	279	1.5	202	1.1
Swansea	3	218	172	1.5	46	0.4
Glasgow	21	3,729	2,366	3.0	1,363	1.7
Edinburgh	12	2,262	1,519	4.8	743	2.3
Dundee	6	1,088	487	2.9	601	0.4
Aberdeen	5	711	411	2.5	300	1.8
Belfast	13	991	823	2.1	168	0.4
Dublin	22	2,818	2,818	9.2	—	—

Source: Calculated on the basis of Comparative Municipal Statistics, Vol. 1, 1912-1913, Table 25, pp. 34-35.

Appendix XIII

List of variables

The data consists of 44 German cities and towns and 16 principal towns in the United Kingdom.

Background variables

1. Persons working in agriculture, horticulture, animal husbandry and fishing as a percentage of all employed people, in 1882, 1895 and 1907 in German cities.
2. Persons working in domestic service as a percentage of all employed people, in 1882, 1895 and 1907 in German cities.
3. Wage labourers of various kinds as a percentage of all employed people, in 1882, 1895 and 1907 in German cities.
4. Independent persons without specified occupations as a per cent of all employed people, in 1882, 1895 and 1907 in German cities.
5. Persons with private means or pensions or income from rented property as a percentage of all employed people, in 1882, 1895 and 1907 in German cities.
6. Civil servants and persons working in liberal professions as a percentage of all employed people, in 1882, 1895 and 1907 in German cities.
7. Persons in army and navy service as a percentage of all employed people, in 1882, 1895 and 1907 in German cities.
8. Persons working in mining, smelting and saltworks industries as a percentage of all employed people, in 1882, 1895 and 1907 in German cities.
9. Persons working in stone and glass industries as a per cent of all employed people, in 1882, 1895 and 1907 in German cities.
10. Persons working in metal industry (including casting, manufacture of machines and instruments, electrical technology, goldsmithing etc.) as a percentage of all employed people, in 1882, 1895 and 1907 in German cities.
11. Persons working in chemical industries (including pharmaceutical industries, explosives etc.) as a per cent of all employed people, in 1882, 1895 and 1907 in German cities.
12. Persons working in industries related to forestry by-products, lighting materials etc. as a percentage of all employed people, in 1882, 1895 and 1907 in German cities.

13. Persons working in textile industries as a percentage of all employed people, in 1882, 1895 and 1907 in German cities.
14. Persons working in paper industries as a percentage of all employed people, in 1882, 1895 and 1907 in German cities.
15. Persons working in leather industries and industries related to similar materials (rubber, gutta-percha etc.) as a percentage of all employed people, in 1882, 1895 and 1907 in German cities.
16. Workers in wood (carpenters, joiners, coopers etc.) as a per cent of all employed people, in 1882, 1895 and 1907 in German cities.
17. Makers of foodstuffs, tobacco and spirituous drinks as a per cent of all employed people, in 1882, 1895 and 1907 in German cities.
18. Makers of clothing and footwear (tailors, seamstresses etc.) as a percentage of all employed people, in 1882, 1895 and 1907 in German cities.
19. Persons working in building occupations (contractors, bricklayers etc.) as a percentage of all employed people, in 1882, 1895 and 1907 in German cities.
20. Persons working in printing and related occupations as a per cent of all employed people, in 1882, 1895 and 1907 in German cities.
21. Persons working in artistic occupations as a percentage of all employed people, in 1882, 1895 and 1907 in German cities.
22. Unspecified factory owners and workers as a percentage of all employed people, in 1882, 1895 and 1907 in German cities.
23. Persons working in commercial occupations (including banking) as a percentage of all employed people, in 1882, 1895 and 1907 in German cities.
24. Persons working in insurance occupations as a percentage of all employed people, in 1882, 1895 and 1907 in German cities.
25. Persons working in postal and railway services (excluding tramways) as a percentage of all employed people, in 1882, 1895 and 1907 in German cities.
26. Persons working in other occupations related to communications as a percentage of all employed people, in 1882, 1895 and 1907 in German cities.
27. Restaurateurs and persons in hostelry occupations as a per cent of all employed people, in 1882, 1895 and 1907 in German cities.
28. Amount of population in 1871, 1880, 1882, 1887, 1890, 1895, 1898, 1900, 1905, 1909, 1900, 1910, 1911 and 1912 in German cities.
29. The percentage growth of population in 1871—80, 1880—1890, 1890—1900, 1900—1910, 1871—1910 and 1880—1910 in German cities.
30. The percentage growth of population of the principal towns in the United Kingdom in 1871—1881, 1881—1891, 1891—1901, 1901—1911, 1801—1911, 1801—1851, 1851—1911 and 1881—1911.

31. Daily wages (ortsübliche Tagelöhne) in German cities in 1892, 1902 and 1912.
32. Dummy variables. Location of the city in Germany (east, west).
33. Dummy variables. Location of the city in Germany (the Ruhr area, Southern and South-Western Germany, North-Western Germany, Central Germany, Eastern Germany).
34. Dummy variables. Applied classification for the German cities (commercial cities, administrative cities, metal industry and mining cities, textile industry cities, garrison cities, regional centres).

Economic basis of cities

35. The landed property of German cities as a percentage of their total area in 1900 and 1912.
36. Debt outstanding for local government purposes (other than Poor Law) at end of the year 1912—13 as percentile proportions of total and net debt per head of population in principal towns in the United Kingdom.
37. Debt outstanding for municipal enterprises in German cities at end of the year 1912 as percentile proportions of total and per head of population in marks.

Infrastructure

38. Area occupied by roads, streets and railways (ha/100,000 inhabitants) in German cities in 1890, 1900 and 1910.
39. Length of sewerage mains (km/100,000 inhabitants) in German cities in 1890, 1900 and 1910.
40. The years of foundation of waterworks in German cities.
41. Water consumption per inhabitant (litres/day) in German cities in 1890, 1896, 1900, 1905, 1910 and 1912.
42. Length of watermains (metres/100 inhabitants) in German cities in 1890, 1900 and 1910.
43. The years of foundation of gasworks in German cities.
44. Length of gas mains (km/100,000 inhabitants) in German cities in 1890, 1900 and 1910.
45. Gas consumption per inhabitant (m^3/yr) in German cities in 1890, 1900, 1910 and 1912.
46. The years of foundation of tramways in German cities.
47. The years of foundation of electricified tramways in German cities.
48. Length of tramlines (km/100,000 inhabitants) in German cities in 1890, 1900 and 1910.
49. Number of passengers carried of tramways in principal towns in the United Kingdom in 1912—1913.

50. Length of tramwayline (km)/city area (100 ha) excluding tidal water on 31st December 1912 in principal towns in the United Kingdom.
51. Proportion of working expenditure to gross receipts of tramways in principal towns in the United Kingdom in 1912—1913.
52. The years of foundation of electricity works in German cities.
53. Consumption of electricity per inhabitant (kWh/yr) in German cities in 1911.

Health care

54. Infant mortality in principal towns in the United Kingdom in 1911 and 1912.
55. Infant mortality in German cities in 1890, 1900, 1910, 1911 and 1912.
56. Number of authorized doctors per 100,000 inhabitants in German cities in 1887, 1898 and 1909.
57. Number of dentists per 100,000 inhabitants in German cities in 1887, 1898 and 1909.
58. Number of veterinary surgeons per 100,000 inhabitants in German cities in 1887, 1898 and 1909.
59. Number of "health servants" per 100,000 inhabitants in German cities in 1887, 1898 and 1909.
60. Number of qualified nurses per 100,000 inhabitants in German cities in 1887, 1898 and 1909.
61. Number of midwives per 100,000 inhabitants in German cities in 1887, 1898 and 1909.
62. Number of pharmacies per 100,000 inhabitants in German cities in 1887 and 1909.
63. Number of pharmaceutical personnel per 100,000 inhabitants in German cities in 1887 and 1909.
64. Number of persons employed in health care (doctors, nurses etc.) per 100,000 inhabitants in German cities in 1895 and 1907.
65. Number of beds in hospitals per 1,00 inhabitants in German cities in 1912.
66. Number of hospital beds in principal towns in the United Kingdom in 1912.

Education

67. Number of students in higher education per 1,000 inhabitants in German cities in 1890, 1900 and 1910.
68. Number of persons employed in education, training and research etc. per 100,000 inhabitants in German cities in 1895 and 1907.

Leisure time

69. Number of persons employed in the theatre and in the field of music per 100,000 inhabitants in German cities in 1895 and 1907.
70. Public woodlands and parks inside the city boundaries, m² per inhabitant in 1910 in German cities.
71. Area of parks and open spaces (m²/inhabitant) in British cities and towns in 1883, 1902 and 1912.
72. Area of parks and open spaces as a percentage of total area in British cities and towns in 1912.
73. People in personal services (hairdressing, laundry services etc.) as a percentage of all employed people, in 1882, 1895 and 1907 in German cities.

In addition, variables selected in other studies have been used as well as census data from Stockholm and Helsinki in 1860—1910.

*On the **reliability** of variables calculated on the basis of Statistisches Jahrbuch Deutscher Städte (Stat. Jb. Deutscher Städte).*

The information published in the Statistisches Jahrbuch Deutscher Städte is based on replies from individual towns and cities to a uniform questionnaire. The aim in this connection was to acquire comparable data.

However, the varying status of the towns and cities in their state (Staat), their different systems of administration and differences in the recording of information affected the availability of data, the level of aggregation and comparability. For example, if a city (such as Düsseldorf) had a centralized administration for municipal enterprises (gas, electricity, water) economic data was more readily available but on the other hand it was impossible to specify the share of administrative costs. Similarly, in the case of several cities it is impossible for practical reasons to specify water consumption for private use and accordingly this study must use data on total water consumption.

Differences in the time of recording or measurement (fiscal/calendar year) also raise problems in assessing services.

In forming indicators of the volume of services per inhabitant the population of the service area has been used where possible. If this figure was smaller than the population of the city, the number of inhabitants of the city was generally used. The censuses of the German Empire which were compiled at five-year intervals always for the first of December provide the most reliable data on the population of the cities. This has also affected the choice of the cross-section data years used.

The figures used in this study are based on information from the Statistisches Jahrbuch. This may entail a degree of imprecision and uncertainty but the statistical publications of the 44 German cities have not been used in this connection. On the other hand conclusions and calculations are based on the classes of magnitude and their proportions and not on the basis of minor differences.

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