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‘Where the action is’. The introduction and acceptance of infrastructural innovations in Dutch cities 1850–1950.¹

Introduction

Industrialisation in the Netherlands started in the latter half of the nineteenth century. It was firstly an urban phenomenon that mainly manifested itself in existing towns and cities – Amsterdam, Rotterdam, the Hague, Utrecht, Groningen, Haarlem, Leiden, Dordrecht, Maastricht, Delft, Schiedam, Deventer and so on. New industrial centres emerged only in a few cases, such as the textile cities of Enschede and Tilburg and the Philips city Eindhoven, in the early twentieth century. Therefore, the urban hierarchy in the Netherlands did not change much under the influence of industrialisation.² The top of the Dutch hierarchy consisted of three cities with more or less complementary functions – Amsterdam was the financial centre and the centre for colonial trade, Rotterdam was the centre for the transit trade with Germany and the United Kingdom, while the Hague was the political centre. All three cities acquired additional industrial functions, especially in the fields of shipbuilding and other metal industries.

Below the top were a number of second rank cities in the west of the country, including Dordrecht, Delft and Haarlem, which had limited service areas and became important industrial centres. In the north the cities of Groningen and to a lesser extent Leeuwarden combined their positions as regional capitals with additional industrial functions – Groningen in printing, metal (bicycles), food (sugar, coffee and tobacco), and ready-made clothing, and Leeuwarden in dairy-related food products. Maastricht in the south also enjoyed a similar double position, but other regional or provincial capitals in the east, north-east and south – Assen, Zwolle, Arnhem, 's-Hertogenbosch (Bois le Duc) and Middelburg – did not manage to acquire many industrial functions. However, industrialisation was an enormous stimulus for urbanisation in all cases. In 1800, 24.5 percent of the Dutch population lived in cities with 20,000 inhabitants and over. In 1900 this percentage had increased to 39.3.³

This process of urbanisation was accompanied by the introduction of new infrastructural facilities such as gas plants, power stations and tramways, and also new newspapers, cinemas and restaurants. It can also be assumed that innovations

¹ Paper presented to the World Economic History Conference, Helsinki, August 2006.

² P. Kooij, ‘Urbanization. What’s in a name’, in H. Schmal (ed.) *Patterns of European urbanization* (London 1981) 33–59. See also this volume.

³ P. Kooij, ‘Stad en platteland’, in F.L. van Holthoon, *De Nederlandse samenleving sinds 1815* (Assen/Maastricht 1985) 93–119, Table 1.

such as cigarettes, bicycles, cars and ready-made clothing were introduced at the top end of the urban hierarchy and from there percolated to the lower classes, as Hägerstrand has already put forward in his diffusion theory.⁴ In addition to this space-bound theory of innovation, there are also time-bound ones that distinguish successive stages, such as the theories of Rogers and Lazer and Bell.⁵ The stages are:

1. Invention
2. Introduction (first consumption by innovators)
3. Acceptance (by early adopters)
4. Adoption (product turns from new to familiar)
5. Assimilation (product has become indispensable)

In this contribution I will analyse the introduction of a set of innovations from a space-time perspective, to try to determine whether the urban hierarchy indeed played a distinctive role in the dissemination of innovations. The products chosen are the bicycle, the motor car, gas and electricity, the department store, and the cinema. All these innovations and many more are collected in the pioneering study by Han Baudet on 100 years of innovation in the Netherlands.⁶ I was involved in that project. All the products selected here refer to economic and social urban and rural infrastructure. The car, for instance, was used in trade and transport but was also a vehicle of conspicuous consumption, while the bicycle was used to commute but also for recreation. Only the cinema belonged more exclusively to the cultural domain.

The dissemination of the bicycle

The velocipede was introduced in the Netherlands in 1867 from London. The modern bicycle, the Rover, was imported in 1885, again from the United Kingdom. The early adopters used the velocipede as a substitute for a horse in a sports context. There were many bicycle races in urban parks on lanes which until then had been used by coaches. The Rover and similar bicycles, which were called 'safety' bicycles, served different goals. They were used by members of the bourgeoisie for household-related trips and also to explore the surrounding nature, which at that time became a fashionable activity for city dwellers. In fact this stimulated two contradictory movements: from the suburbs to the city centre and from the city centre to the countryside.

Although the first bicycles were introduced in Amsterdam, dissemination took a different path. In some places local smiths were very successful in imitating the British examples. The first Dutch bicycle factory was founded in 1869 in

⁴ Torsten Hägerstrand, *Innovation diffusion as a spatial process* (Chicago 1967).

⁵ Everett M. Rogers, *Diffusion of innovation* (New York 1986); W. Lazer & W.E. Bell, 'The communication process and innovation', in *Journal of Advertising Research*, vol. 6 (Sept. 1966).

⁶ H. Baudet, *Een vertrouwde wereld. 100 jaar innovatie in Nederland* (Amsterdam 1986).

Deventer by Hendrik Burgers, other successful factories were located in Dieren near Arnhem (Gazelle) and in Groningen (Fongers). Even as early as 1910, ten percent of the Dutch population owned a bicycle. By 1939 this percentage had already reached 43 percent.



The Fongers bicycle factory in Groningen (source: *Groningen 1913*)

Thanks to the tax on bicycles, it should be possible to trace their dissemination spatially.⁷ So far, however, no one has performed any research on this subject, though we have conducted a survey of the first bicycle clubs in the Netherlands. These clubs were founded by male members of the elite and can be regarded as offshoots of other sports clubs, such as in the fields of cricket and football.⁸ The first was founded in 1871 in Deventer, which was indeed the pio-

⁷ From 1898 a tax on bicycles was incorporated into the so-called personal tax. In 1924 a separate bicycle tax was promulgated. Ferdinand H.M. Grapperhaus, *Over de loden last van het koperen fietsplaatje. De Nederlandse rijwielbelasting 1924-1941* (Deventer 2005).

⁸ J.M. Fuchs & W.J. Simons, *Voort in 't zadel, kameraden. Honderd jaar fietsen in Nederland* (Amsterdam 1971) 40.

neering city for bicycles. In 1872 clubs were founded in Apeldoorn – which was very near Deventer – and Rotterdam. In 1875 a club was founded in Leeuwarden, the capital of the province of Friesland, and in 1880 a second was founded in Apeldoorn, followed a year later by Zutphen, which was also near Apeldoorn and Deventer. Events then gathered pace – in 1882 clubs were founded in Zwolle, the Hague and Haarlem; in 1883 in Arnhem, Wageningen and Breda; and in 1884 in Amsterdam, Leiden, Baarn, Utrecht, Nijmegen, Amersfoort and Rotterdam.

As we can see, all the clubs were established in cities, since only Baarn could actually be defined as a village, though it was in fact a satellite town of Amsterdam. The early adopters seem to have lived in the cities to the east of the country near the Burgers and – from 1892 – the Gazelle factories, rather than the big cities where the bicycle was introduced. The presence of these factories was a big stimulus. A club was established in Groningen soon after the founding of the Fongers bicycle factory in 1884. The Fongers story also illustrates the specific diffusion pattern of the bicycle. From Groningen, the company opened branches at the top of the urban hierarchy: in Amsterdam, Rotterdam and the Hague, in the provincial capitals Utrecht, Arnhem and Middelburg, and the university city of Leiden.⁹ All the branches had a cycle school attached in which women in particular could learn to cycle elegantly before going out on the streets. Women were also soon admitted to the clubs. With a few exceptions, the first cycle tracks were also constructed outside the big cities along highways, especially provincial roads. Stimulus was provided by the General Dutch Cyclists Association, founded in 1883.

The bicycle passed through the five stages of the innovation acceptance model very quickly in the Netherlands. We should now consider whether the car did the same.

The dissemination of the motor car

Thanks to the car tax and the registration number system, it is possible to reconstruct the distribution of the car from its introduction in the Netherlands in 1896. Two cars were sold that year, the first to a photographer in the Hague and the second to a notary in Wieringerwerf,¹⁰ so it was town and countryside from the beginning. In his PhD thesis, Peter-Eloy Staal reconstructed the spatial pattern of this dissemination.¹¹ Since early registration numbers were differentiated by province (A=Groningen, B=Friesland, D=Drenthe) it was very easy to reconstruct the provincial patterns. All provinces displayed the same S-curve – a slow start in the early twentieth century, acceleration in the 1930s, stagnation around the Second World War, acceleration again in the 1950s, and a boom from

⁹ Fuchs & Simons, *Voort in 't zadel*, 21.

¹⁰ Baudet, *Vertrouwde wereld*, 77.

¹¹ Peter-Eloy Staal, *Automobilisme in Nederland. Een geschiedenis van gebruik, misbruik en nut* (Zutphen 2003) 43–55.



The Fongers garage in Groningen (source: *Groningen 1913*)

the 1960s on, slowing down a little in the 1990s.

Staal starts from Hägerstrand's conclusions. Hägerstrand analysed the introduction of the car in Sweden. He initially discovered that there was high car consumption in the big cities and places that functioned as import centres. However, over the long term a positive correlation between car consumption and low population density manifested itself. This was indeed the case, but not in Amsterdam, as though the largest city supported the largest number of cars, it was the Hague that had the highest car density until 1913. This was related to the role the Hague played as the political capital of the Netherlands. At a time when cars were very expensive, most embassies purchased them as status symbols, as did the members of the Dutch elite who clustered around the royal court. The Crown itself, moreover, despite possessing a golden coach, was also an important consumer of cars, especially the Dutch-made and very expensive 'Spyker'.¹²

It is remarkable that the largest number of cars per inhabitant was to be found in the provinces of Utrecht and Gelderland. The first province contains the city

¹² H.A.M. van Asten, 'De Spyker van de weg gereden', *Economisch- en Sociaal-historisch Jaarboek* 33 (1970) 67-119.

of Utrecht, the fourth largest city in the country; but it was Gelderland that housed one of the most important car importers in the country. The same effect was apparent here as in the case of bicycles. The Hägerstrand thesis of initial surplus in the cities was confirmed, but rural areas did not possess relatively higher cars numbers until after 1976. Interestingly, it has been those municipalities situated near the big cities, such as Haarlemmermeer near Amsterdam, that have boasted of the highest car density since that time. This is also in accordance with Hägerstrand's findings, which points out the quick assimilation of cars in the service areas of large cities.

The introduction of gas and electricity

After a few initial experiments with gas production in a few plants and a few efforts to sell gas in transportable containers, the first real coal gas plant was established in Rotterdam in 1827 by the Imperial Continental Gas Association, which opened gas plants in a number of large European cities including Antwerp, Brussels, Berlin and Vienna, from its headquarters in London. In fact, Amsterdam could already boast of its own plant from 1826, though this plant produced its gas from rapeseed oil. The Imperial Continental Gas Association managed to buy a small plant and in 1834 was granted a concession to produce coal gas.¹³ In 1836 Imperial Continental opened a third factory in Haarlem, at that time the sixth largest city in the Netherlands.

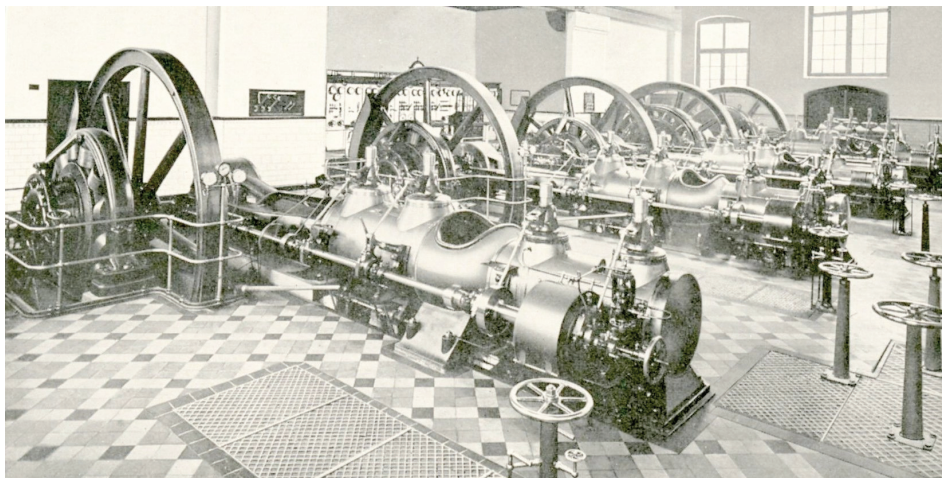
Imperial Continental also tried to obtain a concession for the Hague, but this one was granted to A. van Oven in association with E.E. Goldsmid's firm from Paris in 1844. The plant was opened in 1845. In the meantime, gas plants also opened in Utrecht and Arnhem, founded by John Bryan who had a firm in Newcastle.¹⁴ Bryan also obtained a licence to run a gas plant in Leeuwarden, which he sold to Goldsmid in 1845. Leeuwarden was followed in 1848 by Zwolle and Leiden. The Municipal Council in Leiden decided to build a municipal gas factory. This also occurred in Groningen in 1854.

As Table 1 shows, the spread of gas plants more or less followed the lines of the urban hierarchy, with the largest cities first, followed by a few regional capitals and booming residential and industrial centres. Groningen, and to a lesser extent Maastricht and Nijmegen, appear to be exceptions. In these cities, however, a large number of initiatives were hindered by the central government, who did not permit the introduction of this dangerous innovation in these fortified cities. In Maastricht the local industrialist Petrus Regout was only granted a limited concession because the Crown did not wish to create conditions where an enemy power could deprive a whole city of its energy by blocking the coal supply or turning a tap.

Gas was an immediate success in those large cities. Consequently, smaller pla-

¹³ P. Kooij, 'De gasvoorziening in Nederland rond 1880', *Gas, maandblad van de stichting tijdschrift openbare gasvoorziening* 100 (1980) 266-278.

¹⁴ They were run by W. de Heus, who owned a copper mill in Utrecht.



Power plant Groningen (source: *Groningen 1913*)

ces almost all followed suit. Eighty-one gas plants were built between 1856 and 1870, most by private entrepreneurs. In the largest cities the municipal councils tried to take over these profit-generating factories. The early adopters were the proprietors of luxury shops (clothes, wine or chocolate), hotel and restaurant owners, the municipalities themselves (public lightning and public buildings), and medium-sized factories and workshops where gas machines were used (bread, tobacco, coffee and tea). Individual consumption by private persons started very slowly. Members of the elite started to substitute their oil lamps for gas lamps around 1880. The lower orders followed after 1900.¹⁵ However, by that time electricity had proved itself to be a successful alternative.

In contrast to the introduction of gas, the introduction of electricity followed a rather whimsical pattern. The first power station was founded in 1886 in Kinderdijk, a village near Rotterdam. The plan was conceived by Willem Smit, a producer of electrical goods. In the same year Nijmegen opened a municipal power station, only for public lightning. In 1889 Siemens und Halske opened a power station with limited capacity in the Hague. Amsterdam got a private power station in 1892. In 1895 a municipal power station was established in Rotterdam.¹⁶ In the same year Borne, where the electro-technical firm Hofstede Crull & Willink (later Heemaf) was located, got its electricity supply.

After that events took a more rapid course, with power stations opening in Elst, Baarn, Terborg and Beek-Ubbergen in 1898; in Boxtel, Hilversum, Naarden, Bloemendaal, Abcoude and Maarssen in 1899; and in Driebergen, Hengelo, Valkenburg and Watergraafsmeer in 1900. With the exception of the industrial towns of Hengelo and to a certain degree Hilversum, all these were

¹⁵ Kooij, 'Gasvoorziening', 277.

¹⁶ Before 1900 only two municipal power stations were in operation, in Nijmegen and Rotterdam.

quite small places. Most were commuting centres near Amsterdam and Utrecht, where the well-to-do who wanted this innovative power source lived, and some were villages that did not have a gas plant. Moreover, electricity was easy transportable, which enabled neighbouring municipalities to share a single power plant. Most provinces thus eventually took control of the electricity supply to cover their entire area.

It was the presence of gas plants that caused the relatively late adoption of electricity in the large Dutch cities that found themselves below the top of the urban hierarchy. Most municipal councils had only just taken control of their gas plants from private owners, or had made huge investments to build their own plants. Given such recent investment, they did not wish to stimulate the creation of a serious competitor. As a result, power stations were not built in Groningen and Haarlem until 1902, and even later in Utrecht, Arnhem, Leiden and other big cities (Table 5.1).

Despite that, electricity was an immediate success. It permitted the mechanisation of small workshops with electric motors, while in houses and shops it was

Table 5.1. The largest Dutch cities and innovations.

	inhabitants 31 dec. 1900	start gas	start electricity	first cinema	number of cinemas opened before 1920
Amsterdam	520,602	1826	1892	1903	62
Rotterdam	332,185	1827	1895	1903	33
The Hague	212,211	1845	1889	1906	36
Utrecht	104,194	1842	1905	1908	14
Groningen	67,563	1854	1902	1908	9
Haarlem	65,189	1836	1902	1908	8
Arnhem	57,498	1844	1907	1908	6
Leiden	54,421	1848	1907	1908	10
Nijmegen	44,043	1850	1886	1908	7
Tilburg	41,518	1853	1911	1909	8
Dordrecht	38,804	1852	1910	1910	4
Maastricht	34,182	1849	1910	1910	7
Leeuwarden	33,009	1845	1912	1910	2
Delft	31,787	1855	1910	1912	4
's-Hertogenbosch	31,128	1854	1919	1911	3
Zwolle	30,848	1848	1915	1912	4
Apeldoorn	26,738	1863	1923	1917	1
Schiedam	26,716	1857	1913	1912	2
Deventer	26,224	1858	1915	1911	4
Breda	26,156	1858	1918	1910	4

Sources: See notes 13, 17, 25

preferred to gas because it did not create heat and was easy to handle.¹⁷ Public gas lightning was also considered inferior to electric lightning because every lamppost had to be lit separately. In spite of the late adoption in the larger cities, assimilation followed very quickly. Soon after 1900, all larger cities organised electricity exhibitions where they declared themselves electric cities.

The beginning of department stores

Most large retail chains in the nineteenth century were created by labour migrants from Westphalia. Clemens & August Brenninkmeijer (C&A), Johannes Peek & Heinrich Cloppenburg, Anton Kreymborg, Willem Vroom & Anton Dreesmann all came from that area; with the exception of Willem Vroom who originated from Veendam, a small town east of the city of Groningen. C&A, Peek and Cloppenburg, and Kreymborg all established shops stocking ready-made clothing, while Vroom and Dreesmann founded the first very successful Dutch chain of department stores.¹⁸

Amsterdam, the capital, with its opinion leaders in culture and fashion, was the ultimate goal for these entrepreneurs. There was a hard core of so called Tüötten (hawkers) within this group of labour immigrants from Westphalia. These included Brenninkmeijer, Lampe and Voss – who all originated from four villages in Oberlingen – and Sinkel and Bahlmann, who came from other parts of Westphalia and settled in the Netherlands in the early nineteenth century. Miellet describes their shops as the predecessors of modern retail chains.¹⁹ They started in Amsterdam with small shops and from there founded branches in other cities. Sinkel, who offered a very extensive range, founded branches in Leeuwarden and Leiden – which soon closed – and Rotterdam and Utrecht. He avoided the luxurious Hague, perhaps because his shops catered to the low budget shopper. Bahlmann, who started his career in the Sinkel store, had ten shops, including two big ones in Amsterdam and one in Arnhem.

The Brenninkmeijers, who belonged to the second wave that settled in the late nineteenth century, acted more cautiously. They started in Sneek in the province of Friesland, and from there founded a store in Leeuwarden, the Frisian capital, then moving to Amsterdam. From there they started their expansion all over Europe in 1911, beginning in Berlin. Peek & Cloppenburg moved directly to Amsterdam and from there founded branches in Rotterdam and Groningen, for instance. Kreymborg did the same.²⁰ The spread of their branches is not very well documented, but fortunately, thanks to Philip Hondelink, we do know ex-

¹⁷ P. Kooij, 'De eerste verbruikers van electriciteit in de gemeente Groningen, 1895-1912', *Economisch- en Sociaal-Historisch Jaarboek* 35 (1972) 274-302.

¹⁸ H. Ph. Hondelink, 'Vroom en Dreesmann, de oprichters en hun onderneming 1887-1912', *Jaarboek voor de geschiedenis van bedrijf en techniek* 9 (1992) 159-185.

¹⁹ R. Miellet, 'Westfaalse ondernemers en de opkomst van het Nederlandse grootwinkelbedrijf tot circa 1920', *Jaarboek voor de geschiedenis van bedrijf en techniek* 2 (1986) 135-158.

²⁰ They were imitated by the Groningen brothers Gerzon, who trained in Germany and started a fashion retail chain in Amsterdam.

actly the pattern of the expansion of the Vroom & Dreesmann company.²¹

Anton Dreesmann and Willem Vroom met in Amsterdam, where they were apprentices and later became brothers-in-law. In 1878 they opened their first textiles shop in Amsterdam. Between 1878 and 1892, six other shops in Amsterdam followed. These were existing shops that they took over. Some of these had more variety in the range of products they offered, such as shoes and furniture, which resulted in the firm's slow development from drapery to department stores. The first branch in Rotterdam was opened in 1892, followed the next year by one in the Hague.²² Now the top of the urban hierarchy was covered. It would be reasonable to expect the next branch to have been in Utrecht, but that city had to wait until 1898. In the meantime, branches were opened in Nijmegen (1895), Arnhem (1896) and Haarlem (1896). Tilburg and 's-Hertogenbosch followed in 1899, and Breda in 1900. The next branches were established in Leeuwarden (1902), Middelburg (1902) and Leiden (1903).

With the opening of the Leiden store, all ten of the largest cities in the Netherlands possessed their V&D, as well as Middelburg – a provincial capital – and Alkmaar (1896) and Dordrecht (1901) which got franchise stores. The only big city without a store was Groningen. An older brother of Willem Vroom, Caspar, had his own store there and Willem did not wish to compete with his family.

Family was very important to these immigrants with most stores being run by members of the two families. All the stores were established under their own limited liability company. In the early twentieth century these companies started to establish branches of their own. 's-Hertogenbosch, for instance, opened branches in Eindhoven and Helmond, while Nijmegen did the same in Venlo and Tiel. The third level of the Dutch urban hierarchy was thus also covered. The pattern of the spread of the Vroom and Dreesmann department stores reflects very well the pattern of the Dutch urban hierarchy. Of course there is the exception of Groningen and a slight over-representation in the south, which the Roman Catholic Westfalians preferred to the Protestant north. Cities with a relatively large number of inhabitants but small and heavily contested service areas, such as Delft and Maastricht, were also the last large cities to get V&D branches, in 1904 and 1907 respectively.

In addition to Vroom and Dreesmann, there was one other chain of department stores: De Bijenkorf. In the nineteenth century this was a fast growing shop in Amsterdam. Its great transformation began in 1912 when an enormous store was opened in the centre of Amsterdam, in front of the royal palace. It was only in 1926 that the Bijenkorf became a chain with the opening of a branch in the Hague, designed by the famous architect Piet Kramer, and in 1930 in Rotterdam, designed by Willem Dudok.²³ Only long after the Second World War did some second rank cities get a Bijenkorf.

²¹ See the appendix in his unpublished Master's thesis 'Vroom en Dreesmann. De oprichters en hun onderneming' (University of Groningen, Department of History, 1989).

²² A second shop was opened in Rotterdam in 1898 and in the Hague in 1903.

²³ Roger Miellet, Marieke Voorn, *Winkelen in weelde. Warenhuizen in West-Europa 1860-2000* (Zutphen 2001).



The Bijenkorf in The Hague 1926 (collection Gemeentearchief Den Haag)

The adoption of the cinema

Dutch cinema started in the 1890s. At that time, a few entrepreneurs such as Christiaan Slicker and Carmine Rionzi ran travelling cinemas.²⁴ These exuberant palaces were usually located in urban fairs and sometimes also in villages. Electricity was generated by locomotives running on coal and steam. In the early twentieth century the first fixed cinemas emerged, the first one probably being the Flora in Amsterdam in 1903. There was a high correlation with the introduction of electricity.

As Table 5.1 shows, the dissemination of the cinema followed the lines of the urban hierarchy. All the large cities got a cinema in their turn. Only Apeldoorn seems to have been an exception. This was because this was an atypical municipality which combined a large area with an over-representation of high earners, who were partly attracted there by the royal family, which resided there for part of the year at the Palace 't Loo. As we will see below, this was not the cinema owners' target market. Smaller industrial towns like Dordrecht and Delft therefore accepted cinema earlier.

The spatial dissemination of Dutch cinema was reconstructed by Karel Dibbets. He has published an extensive chronology of the introduction of cinemas by city and village on his website, which provides us with a very appropriate data

²⁴ Karel Dibbets & Frank van der Maden (eds.), *Geschiedenis van de Nederlandse film en bioscoop tot 1914* (Weesp 1986).



Travelling cinema of Jean Desmet in front of the Groningen townhall 1908 (collection RHC Groninger Archieven 1785-7934)

set.²⁵ This data reveals some interesting characteristics of the introduction of the fixed cinema. Until 1910 they were all located in large cities. Some closed almost immediately but others remained open for decades. In addition to the cities listed in Table 5.1, Enschede (1908), Venlo (1907) Vlissingen (1910) and Gouda (1910) also had cinemas. These were all industrial cities with a large labour force, which suggests that the cinema remained entertainment for the lower classes, as it had been at the fairs.

This is confirmed by the list of other places where the cinema was introduced between 1910 and 1915: Alkmaar, Almelo, Amersfoort, Bergen op Zoom, Boxtel, Bussum, Delfzijl, Eindhoven, Emmen, Heerlen, Helmond, Hilversum, Hoogezand, Hoorn, Meppel, Roosendaal, 's Heerenberg, Sittard, Stadskanaal, Tiel, Veendam, Waalwijk.²⁶ This is a mixture of places at the sub-top of the urban hierarchy (Alkmaar, Amersfoort, Bergen op Zoom and Hoorn), industrial centres (Boxtel, Eindhoven, Helmond, Hilversum, Roosendaal and Waalwijk) naval centres (Den Helder, Delfzijl and Meppel) and places in typical industrial

²⁵ See <http://www.xs4all.nl/~kd/index.html>.

²⁶ Only the places where there is no doubt about location or date of opening of cinemas are taken into account.

zones – the Groningen/Drenthe peat area (Emmen, Hoogezand, Veendam and Stadskanaal) and the Limburg coal area (Heerlen). Many members of the lower classes were concentrated in the latter areas in particular. It was only in the 1930s that the cinema became acceptable for the bourgeoisie.

Conclusion

The examples noted above show in most cases quite a firm correlation between the structure of the Dutch urban hierarchy and the introduction of infra-structural innovations. This is not surprising. In fact, a city's population is related to its urban functions, including service functions and the size of the service area as important elements. Service functions that had already existed for ages were joined by new ones in the economic, social and cultural domains. Therefore, some deviations from the general pattern that manifested themselves during the introduction and dissemination of the innovations discussed are in fact of much more interest. They show how the image of these innovations, their properties and characteristics, are of great interest in understanding how adoption and assimilation take place. The level in the social structure where the early adopters of a specific innovation are situated is an important catalyst in this context.

