

# The changing face of European ports as a result of their evolving use since the nineteenth century

Henk van Dijk and Magda Avelar Pinheiro

## Abstract

The aim of this article is to make a comparative study of the history of European ports during the last two centuries showing their complexity and specific characteristics. Whereas during the process of waterfront development, local governments emphasize the relationship of ports with sailing ships as a marketing instrument, the industrial history of those ports are mostly neglected. This article focuses on the industrial port, showing differences in the chronology of construction and in their urban impact. Hinterland and inland transportation were responsible for a part of those differences, as well as geographical and political circumstances. However, social aspects as well as technological issues showed comparable evolutions. The decline of the industrial port city is a part of the general process of de-industrialization of Europe, but it has its own specific features. At least it is clear that the development of port cities during the last two centuries is far more complex than some stage theories about port development assume.

## Keywords

economic development  
urban renewal  
ports  
gentrification

## Introduction

Then all Somerset was round me and I saw the clippers ride,  
High above the moonlit houses, triple-masted on the tide,  
By the tall embattled church-towers of the Bristol waterside.

Sir John Betjeman, 'Bristol'. From *New Bats in Old Belfries* (1945)

Reprint in *The Best of Betjeman* (Penguin Books, 1978).

The image of Bristol as a port city, which the British poet Sir John Betjeman evoked in his poem 'Bristol', unintentionally refers both to the past and the future. As has been the case with many port cities during the past decade, Bristol has experienced an important transformation.<sup>1</sup> The economic stagnation that began in the 1970s as a result of changes in transport and technology, which in turn led to urban decay, was partially halted by a process of urban renovation. During this process, the specific characteristics of various port cities throughout the world were used to transform their image. Sites in the neighbourhood of former harbours were appropriated for the construction of houses and prestigious office buildings. Old warehouses were reconstructed into 'lofts', and by offering specific facilities developers sought to attract specific groups of inhabitants (such as the wealthy elderly or young executives). This phenomenon has often been described in literature as 'gentrification'. Characteristic of those 'new' neighbourhoods is their relationship with the water; a relationship that has been emphasized by the construction of maritime museums, large aquariums, ferry services, marinas, etc.<sup>2</sup>

1 The tonnage in Bristol ports declined from 9 million tons in 1965 to 3.5 million in 1985. Since then some recovery took place (<http://www.shipping.dft.gov.uk/modernports/08.htm>).

2 e.g. <http://www.bardagea.org.uk/docklands/4-waterfront.html>

3 It is clear that the term 'economic decline' could not be used to describe the changes in the ports themselves. Most ports, at least the European ones, took advantage from the increase in global trade and transport. The development of the European Market, later Union, stimulated a growing market for goods. Containerization together with roll-on, roll-off systems made it possible to handle this. However, it not only meant the development of new port areas, outside the traditional port cities, but also a decline in the workforce to be used in handling goods. For example, the most important British ports between 1980 and 1999 showed an increase in their tonnage of 33%, whereas the workforce in this industry declined from 69,000 in 1985 to 25,500 in 1999 ([http://www.bpit.co.uk/pages/employers/news/swdp\\_ext.pdf](http://www.bpit.co.uk/pages/employers/news/swdp_ext.pdf)). It is important to know that this decline was far more dramatic, if one sees that the number of worked hours also declined importantly. The character of employment changed importantly too. Automation meant more service-oriented jobs. And similar remarks can be made for the petro-chemical industries, which were stimulated in port areas after World War II.

It is typical of this process of renovation, which started at the end of the 1980s, that the image of a pre-industrial period is used rather than that of an industrial one. Local municipalities and tourist boards tend to refer back to the period of sailing ships, a time when a relationship between town and harbour still existed. No one likes to be reminded of the industrial port city. In marketing, the industrial port city has largely been related to pollution, overpopulation and recent economic decay, which were mainly due to the advent of new types of transport technologies.<sup>3</sup> The development of prestigious 'waterfronts' is therefore more than just a process of revitalization, it is also a metaphor of *the port city*.

Although it is undeniable that the processes of renovation led to an improvement in urban life, it is no less clear that they are also a mixed blessing. In port cities, the large numbers of the lower class seldom benefit from the growing market for traditional service-oriented jobs. Port cities suffer as much as typical industrial towns from the process of de-industrialization. Recent studies on the labour market of cities like Rotterdam and Antwerp show a higher percentage of unemployed people compared to the national figures. Thus, from this point of view, it is unwise to neglect the industrial past of the majority of port cities.

However, there is another reason for considering specific characteristics of the industrial port city; one with a more theoretical basis. The development of urban planning in port cities is related to a theoretical viewpoint about future developments that has been based on a (rather simple) understanding of historical developments. The majority of these theories can be characterized as stage theories in which three periods can be distinguished: the pre-industrial port city with its direct link between harbour and town; an intermediate industrial period; and finally, the post-industrial port city in which living and water are again related. This theory can be found in the work of Hoyle and others (Minca 1997; Merainer 1990; Tweedale 1989; Hoyle and Pinder 1989); however, it remains questionable whether it is possible to describe the development of port cities with a simple stage theory. Industrialization and developments in transport led to changes and differences that had not been predominant before. Thus, the geographical situation, technology, the availability of capital (as well as political factors), could lead to different situations that, in turn, would have repercussions for the image of the town and the spatial development of port cities. The spatial division, which reflected either the specialization of labour or a growing split between working and living, started quite early in some cities, whilst in others it remains imperfect at this moment. Good examples of cities with a mixed spatial structure can be found in Trieste and Piraeus (Minca 1997).

In this article we will focus on the industrial port city. Using comparisons between different European cities, we will sketch a more general historical development (Andersen 1990; Jensen 1964; Montarini 1989). This means that we are aware of the existence of differences: many current ports flourished during the nineteenth and early twentieth centuries when national states were a dominant factor. National governments could positively influence their own ports by means of political measures, but at the same time, changing political situations could also hamper developments, as the history of Trieste shows. Although this city underwent changes in its political sphere of influence after

World War I, even after World War II specific circumstances can be demonstrated (Minca 1997). While differences in national politics were important for port cities, other processes also had an impact on their specific characteristics, such as the development of a national system of labour relations and changes in technology.

### **The view of the city**

Harbours were an integral part of port cities until the nineteenth century. The majority of these cities were not situated directly beside the sea, but were located slightly inland, on the banks of a river, a lake or an estuary. When the traveller arrived by ship, orientation could be achieved with the help of the town's specific profile (churches, towers and gates, and mosques in the eastern part of the Mediterranean). Arrival in a port city meant that one was received directly into the everyday life of the town. This applied also to goods, which were generally taken into warehouses within the town or even in the attics or cellars of private houses. In port cities the presence of sailors was, of course, a normal daily phenomenon.

With the new technical advances of the nineteenth century (e.g. the construction of larger and faster sailing and steamships, the new docks and specialized warehouses), the appearance of port cities started to change. This was intensified by the new rail connections with the hinterland, which also influenced the face of the town. However, these changes did not necessarily sever the link between living and working in the ports. The cost of transport to and from the workplace and the irregularity of ship arrivals were the main reasons why dock workers had to live in the vicinity of the ports. Also, for a long time it was impossible to geographically separate economic activities related to the transport of goods from the port activities themselves.

Thus, although the expansion of transport increased the pressure on urban space, the combination of living and working was still the normal pattern in nineteenth-century port cities. Dockers and other labourers lived in the neighbourhood of the ports, which was where the sailors could also be found. The local coffee shops and bars not only had recreational functions, but also served as places for the recruitment of labourers and sailors (Andersen 1990; Ayers 1990; Barzman 1997; Jensen 1964; Taplin 1978; Weinbauer 1997). However, when organized industrial relations were also introduced into the shipping industry, and strikes became an integral part of the negotiating process between employers and employees, these places of recruitment represented a problem for the employers as it was often too easy for the strikers to get support for their actions there. This also applied to other types of workers, such as the shipyard labourers (Cattaruzza 1988). The employers tried to tackle this situation by controlling the entrance of the port area. Examples of this policy can be found in Rotterdam, where the new ports (built in the 1860s) were closed by means of a gate building in which the management had its office. Also, the policy to build houses for the shipyard labourers can be interpreted as a way to control them (Cattaruzza 1988). Similarly, in Germany, when the shipyard employers closed the bars in the vicinity of their firms, their main aim was to obtain greater control over those places in which social unrest could easily develop (although they also claimed it was a measure to combat alcoholism).

Despite the traditional link between living and working in nineteenth-century ports, the character of the port city changed considerably under the influence of new transport techniques. The former quality of the waterfront was corroded by the construction of docks, large yards, factories for machine building and for the treatment of products, warehouses and the construction of new railway yards, and was at the expense of large areas of the waterfront that slowly changed its social character. The working class remained (even increasing in number), whilst the wealthier moved to the new suburbs, leaving their former city villas to be converted into offices for the shipping lines.

The shipping companies not only acquired new offices, but the character of their business also changed. Increasingly, ships were becoming part of a large fleet, which meant that, alone, the owner and a few clerks could no longer handle the administration. There was an increasing need for larger offices with a fast-growing staff of bookkeepers, typists and other clerks. Whereas poor travellers (such as emigrants) still used sailing ships, the wealthy wanted regular connections and greater comfort. All this demanded efficient organization and, at the same time, meant that shipping companies had to compete with other firms for presentable office buildings. Ideally, those buildings had to be situated near the ports where the passengers disembarked and the cargo ships arrived, but they should not be in the immediate vicinity of industrial buildings. This situation led to a constant tension between the waterfront's different user groups: the needs for the transport of goods were different from those for the transport of passengers. Thus, to some extent it can be said that at the end of the nineteenth century the battlefield was set. At that time the majority of the larger city ports already had a spatial division between a waterfront with prestigious offices and shipping companies, and an area with yards, factories and warehouses. Typical examples of this were Liverpool, Rotterdam and Gothenburg.

## **Port cities as artefacts**

### ***The construction of ports***

At the end of the eighteenth century, the growth in the maritime circulation of people and goods was the main incentive for the construction of docks and port structures that would facilitate the loading and unloading of ships. To a certain extent, the ports of the twentieth century are radically new (Sargent 1938: 3). At least three factors influenced the chronology of construction (i.e. the amount and type of work to be done): physical geography and tidal flows; developments in technology and energy; and commerce. Initially, dredging the river mouths was essential; however, with the advent of steamships, the capacity for docking increased. In contrast to the smaller works begun at the end of the eighteenth century, much larger and more complicated works were undertaken during the first quarter of the nineteenth century. The growing importance of iron and the steam engine, together with the increase in tonnage, led to the construction of new docks (including locks, dry- and tidal-docks), accompanied by changes in the loading, unloading, repair and construction of ships.

The chronology of the construction of new docks was not identical throughout Europe, neither was the accompanying commercial prosperity of the diverse port cities. As Robert Lee points out, Baltic and Mediterranean commerce declined at the end of the eighteenth century and the early nine-

teenth century concomitant with the increase in colonial traffic. In Marseille, prosperity did not return until the second quarter of the nineteenth century, which, by the 1850s, caused congestion at its old quays. Italian ports, such as Genoa, experienced a similar problem following the opening of the transalpine tunnels.

On the Iberian Peninsula, even the Atlantic ports (such as Lisbon) were stagnant during the first half of the nineteenth century, when the colonial monopoly of the Antigo Regime disappeared. This cost them their place in the redistribution of goods originating from South America. Mendoza considers that the Portuguese ports (and to a certain extent, the Spanish ones), benefited from their excellent location for long-distance sea routes until the railway system brought northern and southern Europe closer together, thus distancing them from the international European circuits (Mendoza 1992: 147).

In the mid-nineteenth century, the works on Iberian ports were rather small and were a carry-over from plans made in the previous century. In Spain, these works were limited to the small ports of Cantabria, whereas the principal Mediterranean ports (such as Alicante and Barcelona) had only a sea wall to help in the loading and unloading of goods. In Portugal, it was only at the end of the Antigo Regime that the dredging of several sandbars was completed. Before the construction of the Lisbon's Railway Company quay in the early 1870s, only the Navy Arsenal had a proper dock equipped for unloading ships.

Port cities in peripheral countries with little capital (e.g. Lisbon and Venice) often continued to load and unload ships in either the harbour or in mid-stream by means of barges (Gamond 1870; Pezerat 1867; Plano Geral das Obras 1874; Loureiro 1904; Regulamento do Porto de Lisboa 1860: 15).<sup>4</sup> In Portugal, the old guilds (including the unloading companies) were abolished in 1834; however, shipbuilding remained tied to the artisan crafts, with particular prominence being given to ship's carpenters. The professions closely related to the rivers, and their traditional ships and boats, were maintained for a long time.

The length of Marseille's dock in 1876 was three times that of Genoa. The average time taken to load a ship in Marseille was three days whereas in Genoa it was three to four weeks. Although the major works carried out in Genoa between 1877 and 1888 led to the construction of 6.4 kilometres of docks, this did not completely alter the situation. Similarly, the port of Venice had an infrastructure that was inferior to that of Trieste (Albert 1995). Work on the port of Lisbon took place between 1887 and 1890; in the new port of Leixões (near Oporto) work began in 1884 and was partially finished by 1892 (Guichard 1982; Sousa and Alves 2002).

The construction of new infrastructure took place much earlier in British ports. The large tidal fluctuations necessitated the construction of special structures for loading and unloading, such as tidal docks and locks. In 1840, Liverpool had 5 kilometres of tidal docks on the south banks of the river Mersey.

The construction of docks started even earlier in London, where the city's bankers and businessmen financed it. In the eighteenth century, the Legal Quays ran between London Bridge and the Tower of London. In 1700, on the south bank, the Sufferance Wharves were established. Despite this, however, the growth in port traffic required that loading and unloading be done mid-stream, which resulted in congestion on the river immediately below London Bridge.

4 It was only at the end of the 1880s that it was possible to construct the great public works in Lisbon. By that time Portuguese engineers were able to carry out those projects and the only discussion of that time concerned political and financial corruption.

In 1799, the West India Dock Company was created to build docks on the Isle of Dogs between Limehouse and Blackwall. Wet docks, basins and locks were built in six years. Ships could now unload their goods into the safety of large warehouses, thus avoiding major losses and thefts. Six docks were built on the south bank of the Thames. By the mid-nineteenth century, London had the best commercial facilities of any port in the world. Work done during the Victorian period extended these facilities downstream.

In ports like Rotterdam and Hamburg, the construction of canals linking the inland port to the sea was a very important development that allowed the presence of ships with a deeper draught and more cargo capacity. The construction of Rotterdam's 'New Waterway' canal to the North Sea dates back to the 1860s. For the ports that were linked to an inland canal or river system, structures for the transfer of goods to and from the barges were essential. Thus, in Hamburg and Rotterdam, open basins were prevalent (in contrast to the closed docks of London). When inland transport was primarily by rail, the tracks came to the quays connecting them to warehouses and railway stations, as was the case in Antwerp. Rotterdam was also the first port in which the private dock facilities were successfully taken over by the local municipality.

Although Marseille was the most important French port, and one of the first nine in Europe, the project to enlarge the port of Le Havre dated from before the Revolution. Meanwhile, the lengthening of the 'Avant port', and the construction of the docks of Barre (650 metres) and of Commerce (2800 metres) were only completed in 1834. The work continued, and by 1847 the Florida dock was complete. In 1878 there were 8 tidal docks, 13 locks, 4 wet docks and almost 9 kilometres of quays.

Marseille started work on the dock of Joliette in 1844 and it was finished between 1847 and 1853. From the start, the need for a new port was evident. It was started in 1856 by the company Des Docks et Entrepôts de Marseille using Parisian capital. The new port had hydraulic cranes, which reduced the work of loading and unloading and which became a target for hostility from the dock workers who had managed to keep their traditional guild organization, despite the Allard law (Sewell 1988). The business community also manifested hostility against the company. A similar phenomenon occurred in Leixões when the building of the port there was given to the Peninsular Docks and Railway Company.

Gradually, cranes and hydraulic winches took over the transfer of goods and required ever more powerful sources of energy. Steam energy gave way to electricity, but both required huge quantities of coal. Until the advent of oil refineries, coal heaps were an ever-present part of the ports' landscape.

In keeping with the increased tonnage of the ships, the new docks to be built had to be larger; this represented a more substantial investment. The growing complexity of the infrastructure and equipment of ports was linked to the emergence of professionals trained in the planning and direction of their construction. The engineers constituted an elite with diverse social positions in Anglo-Saxon and Latin countries, but with an international circulation between the various cities. This favoured the dissemination of schemes, new technologies and models of management and urbanism.

In the second half of the nineteenth century, the expansion of port facilities took place amid intense competition between public-works construction firms,

a fact that also served to advance technological transformations. Powerful cranes now moved the blocks of stone and, more importantly, the foundations were set with increasingly sophisticated drag ships and mechanical digging machines. In the construction of supports, the labourers could now work under water thanks to the introduction of long air chambers, which were used for the first time in 1878 at the expansion of the port of Antwerp; the technique of working behind a shield was also used here from 1880 onwards.

Substantial capital was involved, and this translated into the mobilization of a large unskilled labour pool and the presence of skilled labourers who followed the work from city to city. Work productivity having increased, the numbers of employed workers stabilized. Between 1878 and 1885, Hersent used 1,200 workers for the extension Antwerp's docks, and 1,300 in Lisbon between 1888 and 1890 (Barjot 1994: 104–05). Some of the work was seasonal, with the workers returning to the countryside when it was over, while others faced misery when the job was finished or some crisis forced the work to stop. Although the distribution of salaries favoured the expansion of the urban economy, the housing situation of these workers was often precarious, being mainly situated in degraded neighbourhoods that the growth of public works had contributed towards creating. When the construction of the new docks did not involve landfills and the creation of new spaces, the extension of areas to be dedicated to ports contributed to the densification of the central urban neighbourhoods. This applied particularly to cities whose prosperity and large population growth led to a significant expansion of the dock areas, such as in Liverpool, which opened three new docks between 1830 and 1844.

Even in the nineteenth century, new docks were placed on empty land that would allow the city to expand whenever conditions allowed. For those projects which included large landfills (as was the case in Lisbon, for example), the proposed works aimed to enhance urban hygiene by means of a sewerage system, and foresaw grand avenues, housing for the upper classes and workers, as well as parks and gardens that were never built.

The new docks were generally situated close to the city centres and have been understood as barriers between them and the sea. During the nineteenth century, especially in cities with a tradition of autonomy, the construction of the port infrastructure was financed and controlled by the municipality. Cities like Antwerp fought for this control against the growing intervention of the state (*Notice sur le Port d'Anvers* 1905: 33). Companies often undertook the management of the ports, which prolonged their construction and which were generally constructed outside the city centre and away from its bourgeoisie. This accentuated the distance between the urban population and the sea (Sewell 1988: 164–65).

### **Hinterlands**

The degree to which the hinterland of a port was developed was a determinant factor in its prosperity, or, as Amzalak wrote: 'the commercial ports were almost always a synthetic expression of the economy of its hinterlands' (Amzalak 1923: 24). The quays and docks were part of the new structures with which port cities hoped to respond to the commercial needs of their hinterland, or were an attempt to enlarge it. The growth in port traffic was linked to the characteristics of the hinterland, and technological changes in the system of transportation

could restrict or enhance this. However, the expectations created by the revolutionary potential of the new transportation systems often far exceeded the actual possibilities. The potential 'natural' advantages of tunnels or railway systems were sometimes offset by tariffs, customs barriers or marketplace advantages.

Until the construction of the railway, the existence of a system of canals and rivers served as the cheapest form of transportation, favouring the growth of some ports (e.g. in Britain, the Netherlands, and Germany). Up to the end of the nineteenth century, the transportation of heavy goods via the waterway system was a strong competitor to the railway: however, this traffic could be shared between the two systems, according to the type of goods or to the seasons. In the 1880s, Rotterdam was a centre for the transportation of bulk goods that Germany lacked or exported, with the result that Dutch barges became dominant on the Rhine. Both Rotterdam and Antwerp were connected by river and canal with Germany: even parts of northern France, and the area by the upper Rhine could be served by barge. The connection between railway and canals had extended the limits of the hinterland. Between 1884 and 1913, the type of imports and exports at Emmerich, on the Dutch-German border, changed from mainly agricultural products to iron ore and coal. As a result of these developments, the traditional position of Amsterdam as a port city declined; although the import of colonial goods still continued, their relative importance declined. Antwerp and Rotterdam were the new ports that benefited from the enormously long waterway system (the Rhine and its tributaries) that could be served by barge, and which linked the important industrialized and heavily populated areas with the sea. Although a railway system was also present, it soon became apparent that the barge was the cheapest and easiest way of transporting heavy goods. Although the German government tried to give preferential treatment to its own ports (Bremen and Hamburg), it was difficult to compete with the Belgian and Dutch ports: only the area around Berlin and the industrial region of Saxony could be served better by the port at Hamburg.

In France, which had a relatively strong internal economy, but a rather weak international trade, the growth of its ports was much slower than in Britain, the Netherlands, and Germany. The imbalance between incoming and outgoing freight was manifest in ports such as Nantes-Saint-Nazaire and Bordeaux with their undeveloped hinterlands. Bordeaux had an agricultural hinterland that exported wine and timber but which mainly imported food and colonial goods.

Ports such as Le Havre, Dunkirk and Rouen were already more dynamic due to their more industrial settings, and because Paris served as a strong hub from which railway and cheap river transportation radiated. These ports also benefited from the fact that their external trade was mostly with the ports of northern Europe, which were experiencing a rapid expansion in trade. Marseille, France's largest port in terms of volume, had an extensive railway network in the direction of Lyon and expanded steadily thanks to colonial commerce and trade with the Far East (by way of the Suez Canal). The construction of transalpine tunnels hurt Marseille, which had until then benefited from Oriental trade heading for the French ports on the English Channel via the Lyon railway link. This commerce could now be routed from Genoa, by way of Milan, Strasbourg and Thionville to Antwerp.



In spite of these changes, the ports of Genoa, Trieste and Venice did not manage to compete with Rotterdam, Antwerp or Hamburg as the commercial hub for trade between Europe and the Far East. The conditions offered by the merchant marine (including port infrastructures and equipment) were the main advantages that allowed the northern ports to become the turning points for big business. Due to the progress in steamship navigation, the transalpine route was not destined to become the privileged trade route. Above all, it was thanks to the extensive navigable routes of the interior that enabled the ports of northern Europe to become the principle intermediaries between eastern and central Europe. Twenty years after the construction of the St Gotthard tunnel, Genoa's traffic volume was 30 per cent that of Rotterdam, 37 per cent that of Hamburg, and 38 per cent that of Antwerp.

The idea that commercial currents could be radically altered by changes in transportation technology was influenced by the Saint-Simonian ideology of many of the French or French-trained engineers. Part of the Italian political and economic intelligentsia believed that, thanks to the new railway technology, their country had the ideal geographical position to become the *pays de relays*; however, expectations greatly exceeded actual possibilities. This led to the creation of various lobbies of opponents and defenders of the various projects for the different ports. The most visible consequence was the tariff wars that eventually hurt them all. In addition, given the fact that Italy constituted only a small portion of the entire trade route, the Italians could not play a determinant role in favouring their ports to the detriment of others such as Trieste or Marseille. Only traffic between the Spanish Mediterranean ports and Germany tended to go through Genoa, to the detriment of Marseille (Schram 1995; Merger 1992: 211, 227, 252).

Largely as a result of the country's underdeveloped transportation system, Spanish ports could not aspire to be important points of transit, with Madrid (with its population of 167,000 inhabitants in 1800) suffering the consequences in the form of more expensive goods. This was the main reason for the economic stagnation that the region experienced from the end of the eighteenth century to the mid-nineteenth century. Mainly as a result of the crisis of colonial trade, Spanish ships were unable to compete in the European trade, and were forced to concentrate on coastal shipping. Barcelona, Spain's main port, saw its population of 115,000 inhabitants in 1800 decrease to 83,000 in 1818, only rising the earlier figure again in 1832. By the mid-nineteenth century, Barcelona was the only port in Spain with the function of redistributing colonial products (Pinedo Echevarria 2002).<sup>5</sup> The city provided itself with food and primary materials through sea trade and its export of industrial products, wines and brandies. The other Spanish ports conducted more specialized trade; for example, in Galicia trade was mainly linked to fishing activity and the transportation of emigrants. Santander, Navarra's port, exported iron and coal from the Basque Country to Cuba. After 1870, Bilbao emerged as a very important industrial port, with more than half of the tonnage of the entire Spanish fleet. The Spanish fleet showed by that time an increase as a result of the transport of coal and minerals (Valdalsio 2001).

The creation of links between Madrid and the principal seaports was the aim of all the railway projects presented at the time, and in 1870 they became a reality. However, the lack of economic development, the impoverishment of the

5 Nadia Fernández de Pinedo Echevarria saw this question in a different way while studying the Spanish ships departing from Cuba. Some of them transported sugar, coffee and cocoa directly to North European port cities.

state and the size of the required investments led to the use of a transit system of railway branches that did not translate into profitable routes until they could be traced along common lines.

The construction of railway lines connecting Lisbon with Madrid, Oporto and Salamanca aimed to attract international traffic on its way to the Americas via Spain or France. The Commercial Association of Oporto fought for this construction, convinced that without it their port would be surpassed by Vigo. The Spanish also believed that to make Lisbon the port of Madrid (or Oporto that of Salamanca), would prejudice their ports at Alicante, Cadiz, Santander and Vigo (Mendoza 1992: 150). Consequently, instead of traversing Portugal, the Spanish railway gave up the advantage of shorter distances in the hope of channelling their internal commerce through their own ports. A tariff war ended up eliminating any advantages that the ports of Oporto and Figueira da Foz had over their Spanish competitors (Pinheiro 1995; 1986: 53). Despite the construction of the railway and the improvement of the ports, Figueira da Foz was unable to transform itself into a port with influence over the region of Salamanca, and even lost its rural hinterland to Lisbon and Oporto; and was progressively reduced to fishing and tourist activities (Cascão 1980: 175). In the end, the railway did not destroy the political borders between Portugal and Spain, as both sides thought it might.

### **Urban society in port cities**

The changes in transport not only affected the spatial structures of port cities, but also their social structure. Traditionally, social life in these cities was linked with shipping and trade as sailors often had to stay ashore for a long time between voyages. This was due to the long time required to load and unload cargo and coal, and to clean the ship's boilers. In addition, many sailors had to stay ashore to await their next assignment. The presence of so many sailors had a specific impact on the urban labour market. Some sailors alternated their work between sailing and working in the docks, and only rarely did they work on the same ship. The possibility of a steady contract as a sailor or with a particular company did not become commonplace until the twentieth century, and even then, this was intended more for officers than it was for ordinary sailors. However, this meant that irregularity of work and income was a typical part of the life of the working class in port cities. This was reinforced by the fact that ships were often unable to sail due to inclement weather. This was also reflected in family life, as the women who stayed behind had to cope with irregular incomes and, therefore sought jobs to supplement the family income. This in turn affected the local industry, as we shall see later.

Although the image of a strongly fluctuating labour market persisted during the nineteenth century, new transport techniques also brought differences. The advent of the steamship constituted a major breakthrough in transport. Steamships came into service in the 1840s, and although the old sailing ships adapted and even increased their speed, the coming of the steamship offered regular scheduled travels. Moreover, these ships were able to manoeuvre in ports and small waterways. This was shown after the construction of the Suez Canal in 1869, which drastically shortened the route to Asia. Generally, this particular route could only be navigated by steamships, because of the unreliability of the winds in this area. The steamship not only improved the regularity of transport, but simultaneously represented a new technology with links to other phenomena

in port cities. Although the efficiency of the steam machine improved only slowly (from the compound machine, via the triple expansion to the turbine), the demand for coal was enormous. This implied that coal had to be stored close to every shipping route throughout the world and was typically a British business, related to the political position of the British Empire in the world and to the size of the British fleet. Most of the coal exported from Cardiff, the largest coal port in Europe during the nineteenth century, went to British companies (Daunton 1977: 8).

However, it was not only the steamship that influenced the labour market in port cities. The use of iron, and later steel, led to major changes in the construction of ships and consequently in the way yards were structured. These changes had an impact on the urban character of the port cities and their economic importance, including the labour market. Traditionally, wooden ships were built by skilled personnel in small yards; consequently, experience and skills were important characteristics of shipbuilding. The coming of iron and steel ships created new possibilities for standardization and industrialization, which at the same time increased the demand for new technical skills. Dating from the 1880s, the tonnage of shipping had increased to such an extent that it was necessary to use large numbers of labourers. Shipbuilding thus became an industrial branch, in which Taylorism was experimented. As we shall see, this influenced both the system of rewards and the class structure. At the same time, a process of centralization took place: before that time ships were built in various places along rivers or in small harbours at the coast, now the larger vessels were constructed only in a few places.

Although, traditionally, shipbuilding was already vulnerable to changes in the economic cycle, it became even more precarious and problematic at the end of the nineteenth century. This was mainly because, in many countries, shipbuilding was increasingly seen as a part of a national industrial policy in which imperial and military political considerations played an important role. This meant that, with the exception of Britain (Pollard and Robertson 1979), many countries were prepared to subsidize shipbuilding yards, particularly those constructing naval vessels. A well-known example was the policy of the German Empire, which not only subsidized the construction of naval vessels, but also those of shipping companies that were prepared to construct ships locally (which meant continuity in both naval and civilian orders) (Cattaruzza 1998: 20, 22).

However, Germany was not the only country in which state influence in shipbuilding was more a rule than an exception: this policy was also maintained in other countries until long after World War II. The subsidization of shipbuilding was generally coupled with a system of tax relief in order to support the national fleet. Banks and credit institutions were often involved in this policy, so that (together with trade unions), they were important lobbies in maintaining the national symbol. In the long run this policy was doomed to fail, because the number of ships under a so-called 'cheap flag' increased, which became particularly visible after World War II. Trade unions could do little against this policy, because the percentage of non-European crewmembers also increased.

These were important developments for the port cities. Yards not only took up an increasing part of urban space, which resulted in a tendency to separate the industrial port area from the other parts, but the large-scale character of shipbuilding had an important impact on local labour relations. Strikes in the shipyards could easily spread to other port industries, thus in many port cities the

yards were seen as a breeding ground for socialism or anarchism: names such as 'Red Clydeside' speak for themselves. Nevertheless, in many port cities, strikes (that appealed to the imagination) took place over time.

Shipbuilding was not the only industrial activity, related to transport in port towns, that affected the social structure and social relations. Traditionally, the treatment of imported raw materials played an important role in the economy of port cities. Typical examples can be found in the processing industries of the seventeenth-century Dutch republic; in particular the treatment of foodstuffs. The refining of sugar, tobacco processing, coffee burning and alcohol distillation were industries that played a major role in port cities – especially where they maintained strong links with their colonial lands. In some cases this led to a monopoly of this kind of industry, because the colonial power did not tolerate such activities in the colonies themselves. It is clear that during the nineteenth century, as a result of the population growth and a growing demand for these products, the importance of this industry increased. At the same time, the demand for specific personnel increased. Packaging goods became increasingly important, and the demand for effective marketing and well-known brands increased as a result of a more anonymous market. More and more female labour was introduced and, although it was not a highly paid or esteemed work, it did give women in the working class the possibility to escape traditional employment as household servants. Such a possibility did not exist elsewhere.

However, the treatment of trade products was not equally important in all port cities. Ports that were the gateway to an economic peripheral area, or ports that were only used to handle seasonal products, did not develop this kind of industry to the same extent as the ports that were a link between a (colonial, or semi-colonial) supply area and a home market or hinterland with relatively strong purchasing power. Also, the presence of first-hand trade, as opposed to more intermediate forms of trade, also played a role. The Antwerp ports, which served fast-industrializing Belgium, had first-hand trade as well as many refinery industries, and Amsterdam, Bremen and Hamburg, which had fulfilled that role for many centuries, also had large sugar refineries, coffee-roasting and other industries related to the treatment of colonial products. This was also true for Bordeaux and London. However, in the newly emerging ports (e.g. Rotterdam), where intermediate trade or transshipment were predominant, food-processing industries were not so important.

Comparable differences also existed in the financial services. The presence of capital (and therefore of banking) was more important in the 'old' ports than in the 'new' ones. London, Amsterdam and Hamburg, which had fulfilled this function for a long time, were also important financial centres during the nineteenth century; this was even the case for Venice. In contrast, newer ports such as Rotterdam, Genoa and Marseille, generally had slowly developing financial markets. This was important for both the patterns of investment and the social structure of these port cities. At that time the size of the upper and middle classes was generally small, whereas the lower class was very dominant. That meant that, although port cities were not completely comparable with industrial towns, they did have a predominantly working-class population. Additionally, the labour market was characterized by the predominance of temporary and irregular labour and income. Even in ports like London and Lisbon, which were both capital cities, many labourers had to live with the uncertainty of this irregularity.

## Conclusions

The transport revolution of the nineteenth century, together with the population growth and industrialization of large parts of Europe, changed not only the network of port cities, but also their inner structure. In contrast with theoretical concepts, in which the 'industrial port' is seen as a specific model with hardly any direct links between water and town, the reality was quite different. Port cities in Europe, however different they may be, underwent remarkable changes over time. With their specific social and economic structure, they represented a unique type of urbanization; a fast-growing population in which the lower class dominated, but without the skewed class structure of the nineteenth and early twentieth-century industrial centres. A large proportion of this population still lived and worked for a very long time in the vicinity of the ports. Their living conditions were often detrimentally affected by the advent of new transport-related industries, such as the yards and factories for processing goods and food, but they had to stay because the character of temporary labour gave them little choice. Only during the twentieth century would this strong connection between living and working break, following the pattern already started by the upper classes at the end of the nineteenth century.

The urban landscape of the port areas, by origin a mixed area, became more and more specialized and functional. Some areas were typically transport related and industrialized, whereas others had more prestigious office buildings and stations for passengers. World War II proved to be the watershed in this development: passenger transport (which many European governments and investors hoped would return after the period of economic crisis of the 1930s) was quickly taken over by air transport, whereas major changes in technology (e.g. containerization, 'roll-on, roll-off', oil pipelines, etc.) demanded new infrastructures with better links to national and international transport infrastructures than with the port city itself. The development of an important petrochemical industry in some of the port cities after 1945 seemed to be a temporary solution. It was designed as a remedy against the weaknesses of the labour market in the ports that became visible during the economic crisis of the 1930s. The decline of world trade led to a dramatic increase in unemployment during that period; in some cases to levels much higher than national averages. However, the new industries demanded only a small number of skilled personnel, and could not be a substitute for the decline of dock work.

The decline of the labour market for less-skilled labour, as well as the decline of an important part of the port-related industry, left port cities with a series of problems, for which the development of a new 'waterfront' was considered the universal remedy. In the image-building of the new port cities, they referred to the pre-industrial port with its nostalgic sailing boats, rather than to the 'industrial' part of their history. However, these problems figured largely as a part of the entire process of the industrialization and de-industrialization of Europe. For example, the decline in shipbuilding was substantially different from the restructuring of the textile industry (Schultz 1993; Köhler and Stiftung 1994). The new 'waterfronts' may be a remedy against urban decay, but they cannot provide an adequate solution for the unemployment of a dominant working class with its specific characteristics.

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