# Maritime know how and dependences in The Blue Denmark, 1755-2008 – A Danish maritime history from the perspective of a maritime supplier


## René Taudal Poulsen

Assistant professor, PhD
University of Southern Denmark
Department of Maritime Research and Innovation,
rtp@sam.sdu.dk


## Introduction[1]

In 1987, the term Blue Denmark was coined by Knud Pontoppidan, President of the Danish Shipowners' Association. He did so in a Danish newspaper article. Pontoppidan's intention was to direct the public's and the politicians' attention to the contribution of Danish shipping to the Danish economy, arguing that an entire Danish maritime cluster depended on Danish shipping. Building on the business cluster concept, Pontoppidan's Blue Denmark included diverse maritime industries, notably the shipping companies, shipbuilders, ports, various maritime service and supply companies in addition to the public maritime administration and maritime schools and academies.[2]

In the last two decades, the maritime cluster concept and The Blue Denmark label have been widely referred to by shipping companies and maritime suppliers headquartered in Denmark as well as by the Danish maritime authorities.[3] Industry representatives and maritime administrators alike see clustering of maritime companies and maritime organisations as a means to reach critical mass and increase Danish competitiveness in global markets.[4] In part, these notions build on ideas advanced in the 1980'ies and 1990'ies by Harvard economy professor Michael Porter, who argued that clusters are an important source to industrial leadership.[5]


[1] Acknowledgements: I would like to thank Iver C. Weilbach Fonden for financing my research. Director Torben Frerks, former director Erik Klitgaard, former vice director Jørgen Marcussen and accountant Palle Dyre from Iver C. Weilbach & Co. A/S have given highly valuable advice. I would also like to thank my colleagues at the Department of Maritime Research and Innovation, University of Southern Denmark, director Kristen D. Nedergaard and Drs. Jacob Kronbak and Maria Anne Wagtmann, and director Morten Hahn-Pedersen from the Fisheries- and Maritime Museum in Esbjerg and Dr. Bo Poulsen, Roskilde University for important comments.


[2] Henrik Sornn-Friese and Martin Iversen (in prep.). 'Incentives, Capability, and Opportunity: The Global Breakthrough of The Danish Shipping Industry, 1985-2007' refers to Knud Pontoppidan's article 'Nyt dansk skibsregister vil stoppe tonnage-flugten' in Jyllands-Posten, September 30, 1987.

[3] Sornn-Friese and Iversen; Henrik Sornn-Friese, 2003. *Navigating Blue Denmark: The Structural Dynamics and Evolution of the Danish Maritime Cluster*, Søfartsstyrelsen, København.

[4] Anonymous, 2006. *Danmark som Europas førende søfartsnation*, Danish Maritime Authorities/Søfartsstyrelsen, København. See also Niko Wijnolst, Jan Inge Jenssen and Sigbjørn Sødal, 2003. *European Maritime Clusters: Global trends, Theoretical Framwork, The Cases of Norway and the Neverlands, Policy Recdommendations*, Dutch Maritime Network and Delft University Press and Niko Wijnolst (ed.), 2006. *Dynamic European Maritime Clusters*, Maritimt Forum Norway and Dutch maritime Network, IOF Press, Amsterdam for a similar European perspective.

[5] Michael E. Porter, 1990. *The Competitive Advantage of Nations*, Free Press, New York.

The term Blue Denmark is only 21 years old, but Denmark has a much longer maritime history. Indeed, The Blue Denmark as defined by Pontoppidan was equally diverse and comprehensive centuries back in time. The components of The Blue Denmark are related and at least partly interdependent. Nevertheless, no one has examined the relations between the cluster components in a long historical perspective. Business and maritime historians have written monographs on the leading Danish shipping companies, and recently seven scholarly volumes on the history of Danish shipping came out.[6] Generally, historians have focused on ship-owners, ships, trading patterns and mariners. However an important aspect of Danish maritime and economic history, the dependences within The Blue Denmark, has been neglected so far. Indeed, historians have tended to forget about maritime suppliers and their relations to shipping companies and shipbuilders. This is remarkable given the fact that the maritime suppliers have often delivered highly important services to shipping companies and shipbuilders.

The paper focuses on dependences within the Blue Denmark and examines two related topics. Firstly, the paper asks to what extent the maritime suppliers have relied on Danish ship-owners and Danish shipbuilders from the eighteenth century to the present. Did maritime suppliers ever prosper in times of decline in Danish-controlled shipping or Danish shipbuilding? Secondly, the paper examines the sources of maritime know how, asking how maritime supply companies got access to up-to-date knowledge on safe and efficient navigation. Such knowledge is crucial to suppliers of maritime services. In short, the paper asks how maritime know how and dependences within The Blue Denmark have influenced the competitiveness of Danish maritime supply companies since the eighteenth century.

The paper adopts a case study approach in order to illuminate the above two questions, and it selects the maritime supply company of *Iver C. Weilbach & Co. A/S*, in short Weilbach, as its case. Being a relatively small player in The Blue Denmark, Weilbach nevertheless delivered highly important services to shipping companies and shipyards. For almost 250 years, Weilbach produced nautical instruments, in particular magnetic compasses, for the merchant fleet. Since the 1930'ies, Weilbach has also supplied nautical charts mainly to the Danish merchant fleet, and in the 1970'ies maritime publishing was added to the business. In 2005, Weilbach celebrated its 250$^{th}$ anniversary, which was a unique event in The Blue Denmark. Therefore the company gives the historian a unique opportunity to study dependences within The Blue Denmark in a long perspective. Furthermore, Weilbach has given the author unrestricted access to the company archives.

The main sources for this paper come from two archives. Firstly, the Weilbach company's archives covers the twentieth century. The archive consists of board meeting minutes, internal correspondences, order books and company accounts. The Weilbach archival material allows for a detailed analysis of the objectives and motives of the management, and it can illuminate important dependences within The Blue Denmark. For the eighteenth and nineteenth century, the Weilbach archive contains little relevant material. However, the archives of *Københavns Flag-, Sejl- og Kompasmagerlav*, the Copenhagen guild for flag-, sail- and compass-makers, generously compensates for this lack. Until 1862, the guild members had a monopoly on the production of nautical instruments in the Danish capital and the guild organised the labour market for sail- and compass-makers. Based on the members' lists for the guild, it is possible to trace

[6] Ole Lange, 1995. *Logbog for Lauritzen 1884-1995: Historien om konsulen, hans sønner og Lauritzen Gruppen*. Handelshøjskolens Forlag, København; Ove Hornby, 1988. *"Ved rettidig omhu": Skibsreder A.P. Møller, 1876-1965*, Schultz, København; Bo Bramsen, 1983. *Hundrede år under Dannebrog 1883-1993*, Rederiet Dannebrog, Rungsted Kyst; *Dansk Søfarts Historie*, vol. 1-7, 1997-2002, Gyldendal, København.

the development of the maritime suppliers in Copenhagen over the period 1760-1860. Weilbach, the leading sail- and compass-maker at the time, was highly involved in the guild. Both archives give information on the dependences within The Blue Denmark and the maritime suppliers' sources of maritime know how.

## The transfer of maritime know how from sea to the suppliers

Weilbach's business was established in Copenhagen in the year 1755 by the sail- and compass-maker Iver Jensen Borger. Born in 1722, Iver Jensen Borger sailed on a Danish Eastindiaman on a voyage to the Danish colony Trankebar in India from 1751 to 1754. Though never a large colonial power, Denmark engaged heavily in the overseas trades in Asia, Africa and the Americas at the time, and Danish trading companies controlled a relatively large fleet of vessels for such trading. These vessels often carried sail- and compass-makers on the overseas voyages, because the nautical instruments, the magnetic compass, and the large number of sails required continuous maintenance. In the latter half of the eighteenth century and the early nineteenth century, sail- and compass-makers commonly undertook overseas voyages in order to practise their profession at sea. Members' lists from the Copenhagen guild clearly show this to be the case.[7]

Upon his return to the Danish capital, Borger established his own sail- and compass-maker business. He brought with him maritime know how from his time at sea. Clearly this was valuable information for the business, and two of Borger's grandsons made similar overseas voyages before settling as sail- and compass-makers in Copenhagen in the early nineteenth century. Borger died in 1799, but his son-in-law, Johan Philip Weilbach, continued the business, and a grandson, Iver Jensen Weilbach, became head of the business in 1831. From the early history of Weilbach, it is evident that maritime know how on safe and efficient navigation was continuously transferred from sea to the maritime suppliers and contributed to the growth of Weilbach's business.[8]

## The growth of neutral shipping and maritime suppliers

In the latter half of the eighteenth century, hostilities between the strongest European powers disrupted international trade, but Danish shipping and merchants benefitted from Denmark's neutral status. The Danes continued the profitable overseas trading, and merchants from fighting countries transferred to the Danish flag, registering their ships in Copenhagen. Thus, the Danish flag was used as Flag of Convenience, and Copenhagen shipping boomed. Denmark successfully avoided involvement in the Napoleonic wars until 1807.[9]

Despite the boom in shipping, shipbuilding declined in the Danish capital during the 1780'ies and 1790'ies, indicating that growth in shipping did not automatically transfer to other maritime sectors. In this case, the linkages between the ship-owners and the ship-builders were relatively weak. Indeed, the two sectors held conflicting views on the business and shipbuilding policies of the Danish government. Ship-owners wanted access to cheap, new vessels both from Denmark and abroad, whereas the local shipbuilding industry

[7] Københavns Stadsarkiv: Københavns Flag-, Sejl- og Kompasmagerlav, 14-16. Svendeprotokoller, 1759-1845.
[8] René Taudal Poulsen, 2008. *Weilbach og Det blå Danmark, 1755-2008*, Iver C. Weilbach & Co. A/S, Copenhagen. (Henceforth referred to as: Poulsen 2008b).
[9] Ole Feldbæk 1997. *Dansk Søfarts Historie*, vol. 3, Gyldendal, København

argued for subsidies and import-tariffs for new ships in order to support the local shipbuilders. In the late 1770'ies, the shipyards were favoured by such tariffs, but later the government changed its policy in order to accommodate the wishes of ship-owners, allowing for the import of cheap vessels. The liberalisation contributed to a gradual decline for Copenhagen shipbuilders, who also suffered from high costs.[10]

Interestingly, the Copenhagen sail- and compass-makers, including Weilbach, profitted from the growth of Copenhagen overseas shipping in the 1780'ies and 1790'ies, and did not suffer from the decline of shipbuilding in the capital. Indeed, the members' lists for the sail- and compass-makers' guild doubled from 1780 to 1795 despite the decline of Copenhagen shipbuilding. Apparently, the growth in the overseas trading compensated from the import of vessels from elsewhere. The growth of the maritime suppliers is evident from Figure 1, which shows the up- and downturns of this group of maritime suppliers over 100 years from 1761 to 1860. The figure is based on two sources the member lists of the guild from 1761 to 1845 and the Copenhagen police statistics on artisans in the capital, covering the period from 1826 to 1860. For the overlapping years, the two sources are not in complete agreement, but they do show the same overall trends.

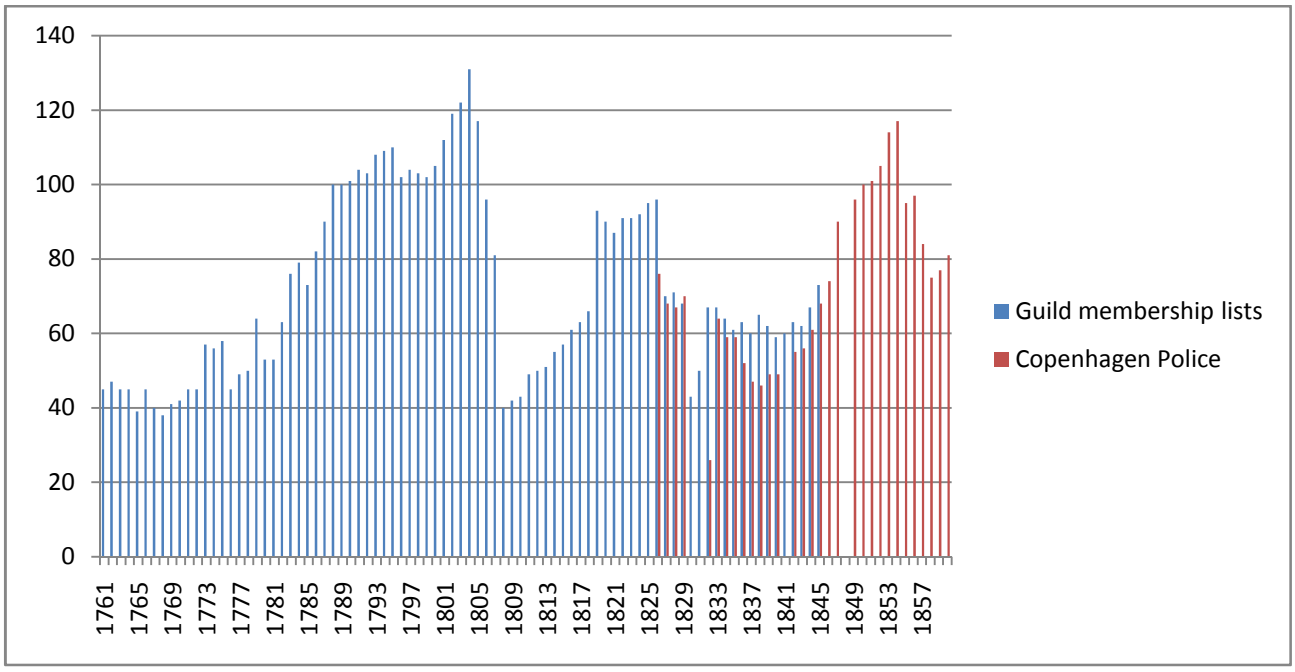


**Figure 1. Number of active flag-, sail- and compass-makers in Copenhagen, 1760-1860, as indicated by the guild member ship lists and Copenhagen Police's artisan statistics.** [11]

## Stagnation and slow recovery, 1807-1860

Figure 1 shows a dramatic drop in the number of sail- and compass-makers around 1807. This abrupt ending of the boom was caused by political changes, as Denmark became involved in the Napoleonic wars, siding with France. The end of Danish neutrality also ended the profitable overseas trade. The Danish

[10] Feldbæk 1997

[11] Københavns Stadsarkiv: Københavns Flag-, Sejl- og Kompasmagerlav. 14-16. Svendeprotokoller, 1759-1845. 13. Regnskaber, 1826-62: Generaltabel over Laugenes Interessenter og Mestere samt Svende og Drenge i Kjøbenhavn (Københavns Politikammer).

merchant marine became enemies of the world's largest naval nation, Britain, and many Danish ships were confiscated by the British during hostilities. Consequently, two-thirds of the sail- and compass-makers left the business within a short period of time, and few returned afterwards. Most of the owners of sail- and compass-makers' businesses continued as such but at smaller scale, and the recruitment of new sail- and compass-makers was reduced.[12] Peace came in 1814, but the favourable conditions for Copenhagen's overseas trading did no return, and the Copenhagen merchant fleet stagnated in the following decades.[13] Overall, the development in shipping explains the slow recovery of the maritime suppliers in the Danish capital. While some recovery did take place in the early 1820'ies, this recovery was short-term, and a long-term and more durable expansion only started for the sail- and compass-makers in the late 1840'ies, when the number of sail- and compass-makers doubled in response to the growth in the Copenhagen merchant fleet.

The stagnation of the Copenhagen merchant fleet from the 1810'ies to the late 1840'ies, contrasts with the long-term growth of shipping in provincial towns.[14] Focusing on domestic trades and trades in the North and Baltic Seas, the provincial maritime communities expanded in the following decades. It is not clear to what extent the provincial fleet was locally supplied, but it is evident that the Copenhagen suppliers were not able to penetrate these markets after the peace settlement in 1814. Possibly provincial maritime suppliers succeeded in supplying the provincial markets.

In the middle of the nineteenth century, economic liberalisations changed the laws for Danish artisans' labour market. In the law of 1857, guild and other monopolies were abolished. The law entered into force in 1862, and allowed everybody to establish their own business as artisans. Danish historians have examined the consequences of the liberalisation, and have generally argued that liberalisation was a gradual process, which predated the official abolition of the guilds.[15] Unfortunately, it is difficult to examine the long-term consequences for the sail- and compass-makers, because the guild archive contains very little information from the period after 1862. It is evident, however, that technological and commercial changes in Danish shipping posed new challenges to the maritime suppliers at the time.

## Technological and commercial innovations in The Blue Denmark, 1850-1914

The nineteenth century transition from sail to steam is a classic topic for maritime historians, and historians have also analysed this change carefully in a Danish context.[16] In the Danish case, the transition was a long one, spanning almost a century. Danish historian Anders Monrad Møller has emphasised

[12] Poulsen 2008b.
[13] Anders Monrad Møller 1998, *Dansk Søfarts Historie*, vol. 4, Gyldendal, København.
[14] Møller 1998.
[15] Bjarne Hastrup, 1979. *Håndværkets økonomiske historie, 1879-1979*, Håndværksrådets Forlag, København; Vagn Dybdahl and Inger Dübeck, 1983. *Håndværkets kulturhistorie: Håndværket og statsmagten, Perioden 1700-1862*. Håndværkerrådets Forlag/Schultz, København.
[16] Lars U. Scholl and Merja-Liisa Hinkkanen (comps.), *Sail and Steam: Selected Maritime Writings of Yrjö Kaukiainen*, Research in Maritime History no. 27, Maritime History Publications, St. John's, Newfoundland; Berit Eide Johnsen, 2001. *Rederistrategi i endringstid: Sørlandsk skipsfart fra seil til damp og motor, fra tre til jern og stål. 1875-1925*, Høyskole-Forlaget, Kristiansand; Møller 1998; Ove Hornby and Carl-Aksel Nilsson, 1980. 'The Transition From Sail to Steam in the Danish Merchant Fleet, 1865-1910' in *Scandinavian Economic History Review* Vol. 28:2, pp. 109-34.

complementarities between the two modes of propulsion and shown that sailing vessels remained competitive in many trades long after the introduction of steam. In Denmark, the balance between the two modes of propulsion only shifted in 1897, even though the first steam ship entered into service in 1819.[17] The response of maritime suppliers to the technological changes in the merchant marine has not been carefully examined. Ultimately, the change of technology undermined the market for sail production. While some steam ships carried supplementary sails, the market for sail makers was clearly in the decline after 1900. Even the advent of private yachting in the twentieth century did not compensate for the loss of the market in the merchant marine. In the early twentieth century, the Weilbach family responded to the technological changes but shifting business focus from production of marine sails to tarpaulin and tents, thus diversifying and building on established know how.[18]

For Weilbach the transition from sail to steam did not offer new opportunities, but another technological change of the nineteenth century certainly did. As shipbuilding gradually shifted from wood to iron and later steel, a new market for the nautical instrument makers emerged. The magnetic compasses were influenced by the steel and iron of the ships' hulls and superstructures, causing deviation. Continuously the magnetic compasses should be corrected for deviation, and compass-makers were qualified to undertake such work. It is not clear exactly when Weilbach did the first compass corrections, but certainly the company succeeded in penetrating the market in the early twentieth century. The work was mainly undertaken by former master mariners, who had typically sailed for some years before embarking on a career with the compass-makers.[19] The compass correction businesses is yet another example of the transfer of mariners' know how from the sea to the maritime suppliers.

Also in the latter half of the nineteenth century, commercial changes in Danish shipping and shipbuilding influenced the market opportunities of the maritime suppliers. In the latter half of the century, Copenhagen emerged as the unrivalled Danish, maritime centre. The high capital requirements related to steam ship acquisitions caused a concentration in the ownership of merchant ships in Copenhagen, where large amounts of capital were readily available for the maritime sector. Copenhagen became the centre of Danish steam ship companies, which were mainly limited companies. Previously, the supply industry had a large group of relatively small customers, but the growth of the limited companies based in Copenhagen changed this. In particular *The United Steamship Company* (DFDS), founded in 1866, became a dominating force and customer for the maritime suppliers in the last five decades before World War One.[20]

Provincial shipyards continued the construction of sailing ships, but the future of Danish shipbuilding certainly lay with the steel shipyards. In 1843, the first such shipyard, *Baumgarten and Burmeister*, was established in Denmark. Later it changed its name to *Burmeister & Wain* (B&W), and it was followed by a new shipyard in Elsinore in 1882. In the nineteenth century, the main part of the expanding Danish fleet of steam ships was built abroad, as indicated by Figure 2. Initially, Britain, the leading industrial nation of the time, was the main supplier of steam ships, but it is not clear to what extent British build-ships were supplied by local suppliers in the Clyde and Tyne-shipbuilding centres. The expansion of Danish steel-ship-building in the last decades of the nineteenth century is clear, however. The linkages to between the

[17] Møller 1998.
[18] Poulsen 2008b.
[19] Poulsen 2008b.
[20] Møller 1998, p. 10.

shipyards and the suppliers have not yet been thoroughly examined in a Danish context. In Sweden, historian Jan Kuuse has demonstrated that a large maritime supply industry was only established decades after the Swedish steel-shipyards.[21] For the late nineteenth century, the Weilbach archives are very slim, so it is difficult to know if the Danish development resembles the Swedish story. Further research in other maritime supply businesses may be able to elucidate the question of linkages between Danish steel-shipbuilding and maritime suppliers.

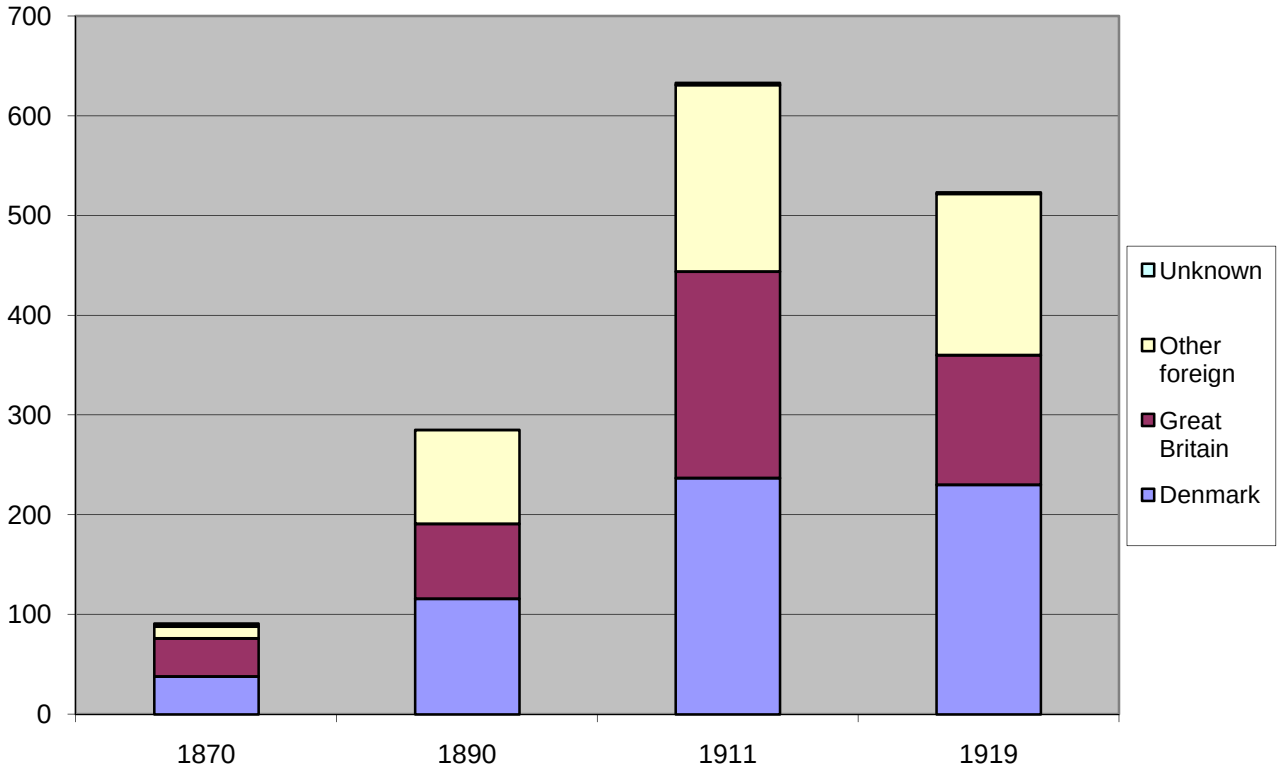


**Figure 2.Number of vessels in the Danish steam ship fleet, by country of built, 1870-1919.**[22]

In 1887, Weilbach's business was split between two brothers, Iver C. Weilbach and Johannes S.V. Weilbach. The former took the compass and nautical instrument business, and the latter got the sail business. The reasons for the split are unknown. Perhaps the split was the easiest way to satisfy two ambitious sons. From 1887 onwards the two businesses developed separately. The sail maker firm diversified to tarpaulin and tent production, but ceased in the 1970'ies. Iver C. Weilbach continued the production of nautical instruments, and the business still bears his name.[23]

[21] Jan Kuuse, 1983. *Varven oc underleverantörerna: Förändringer i fartygsbyggandets industrielle länkeffekter*, Svenska Varv AB, Kungälv.
[22] Anders Monrad Møller, Henrik Dethlefsen and Hans Chr. Johansen, 1998. *Dansk Søfarts Historie*, vol. 5. Gyldendal, København, p. 39.
[23] Poulsen 2008b.

## Vertical integration and growth in The Blue Denmark, 1910-75

For neutral nations, wars often offer attractive business opportunities, and this was also the case for Denmark during World War One. Rising freight rates caused a boom in neutral shipping, and Danish shipping-companies and shipbuilders expanded heavily in this period.[24] The backbone of The Blue Denmark throughout the twentieth century, the shipping companies of *J. Lauritzen*, *A.P. Moller* and the *East Asiatic Company* (EAC) successfully expanded vertically and horizontally during the war and developed into full-scale maritime conglomerates, controlling diverse groups of shipping companies, shipyards and some maritime suppliers. During the war, the companies set up their own shipyards in Køge, Odense, and Nakskov, respectively. During the post-war slump, many shipping companies and shipyards succumbed, but the three maritime conglomerates had resources to continue expansion. The inter-war period was generally a time of difficulties in shipping, with high overcapacity and periodically high lay-up-rates. Nevertheless, the maritime conglomerates successfully entered important, emerging markets, i.e. liner shipping in the Pacific (*Maersk Line*), oil tankers (*Maersk Tankers*) and reefers (Lauritzen Reefers).

A comprehensive statistical analysis of the ordering strategies of the maritime conglomerates would be useful to understand the linkages within the Blue Denmark in the interwar-period. Based on the Danish registry of shipping, it seems fair to conclude, however, that the maritime conglomerates build mainly in their own shipyards henceforth.[25] Certainly, in the period after World War Two this was the case, as evidenced by Figure 3. The figure shows where Danish shipping companies build their ships from 1951 to 2007, clearly indicating that Danish shipyards were the main suppliers of newbuldings for the Danish shipping companies until the mid-1990'ies. The vertical integration and high demands from the owners enabled Danish shipyards to develop advanced ship designs, and in many cases the shipyards stayed in the technological forefront of the industry from the 1950'ies to the 1990'ies.[26]

[24] For Greek shipping see Gelina Harlaftis, 1996. *A History of Greek-owned Shipping: The Making of an international tramp fleet, 1830 to the present day*, Routledge, London and New York; For Norwegian shipping see Stig Tenold and Atle Thowsen, 2006. *Odfjell: A History of a Shipping Company*, Odfjell, Bergen; For Swedish shipping see: Jan Kuuse and Kent Olsson, 1997. *Sjöfart och sjöförsäkring under 125 år,* Sveriges Ångfartygs Assurans Förening, Göteborg. For Danish shipping see Lange 1995 and Møller 1998.

[25] Poulsen 2008b.

[26] Poulsen 2008b; René Taudal Poulsen and Henrik Sornn-Friese, in prep.,' Downfall delayed – The process of Danish maritime deindustrialisation'.

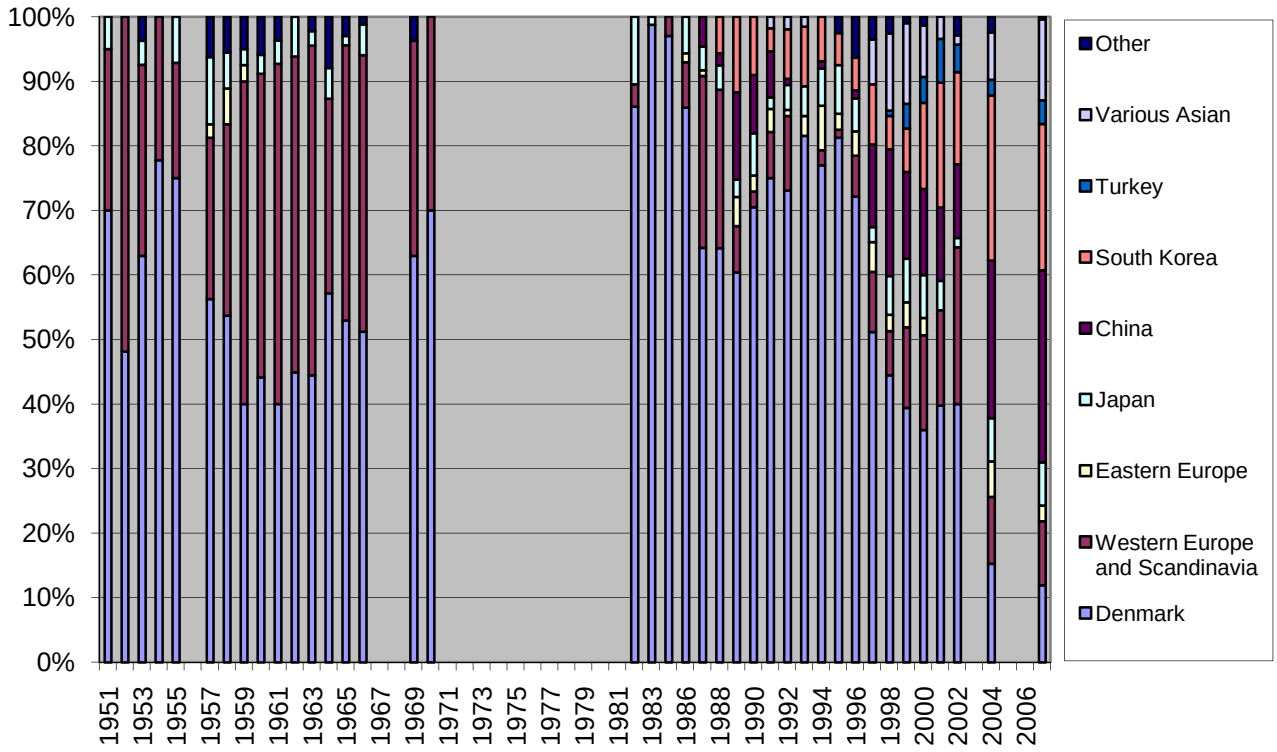


**Figure 3. Danish shipping companies' newbuildings, by country or region, 1951-2007.[27] For the period 1951-57, the data sets covers vessels delivered, and for the remainder of the period, the graph shows the vessels on order.**

How did Weilbach respond to the changes in The Blue Denmark? The short answer is that Weilbach succeeded in establishing a presence in new markets. In particular, the company got new customers for nautical instruments at the new steel shipyards during World War One and succeeded in maintaining these relations for decades.[28] In the interwar period Weilbach developed into the dominating nautical instrument maker in Denmark. In 1908 Iver C. Weilbach got a business partner from outside the family, Knud Prahl, a master mariner. When Iver C. Weilbach died a few years later, ownership of the company had passed to non-family members. Prahl stayed in the business until 1928, and he recruited other master mariners to the business, including the dynamic Carl V. Sølver. Sølver was headhunted from a competing compass-maker in Copenhagen in 1916 and in the inter-war period he succeeded in expanding Weilbach's businesses. Under Sølver's leadership, Weilbach became the dominating nautical instrument maker in Denmark. For many years, another master mariners, Anker Svarrer, was also part of the Weilbach management, indicating that mariners' maritime know how was still highly important to the maritime suppliers.

Not only did Weilbach successfully build relations to the new shipyards and the leading shipping companies, it also entered a new market in the interwar period. Weilbach got the Danish agency for British *Admiralty charts*, nautical charts produced by British hydrographers, which covered the globe. From 1931 Weilbach supplied nautical charts to the Danish merchant marine. In the interwar period, the market was relatively small due to competition. Weilbach's nautical chart department got a real breakthrough in 1957-58 when the expanding shipping company of A.P. Moller became a loyal customer. A.P. Moller has

[27] *Søfart*, 1951-2008; Poulsen 2008a.
[28] Poulsen 2008b.

remained as such ever since, and still is by far the largest customer with Weilbach. Weilbach's relation to A.P. Moller is a clear example of a strong and stable relationship within The Blue Denmark, and demonstrates the role played by A.P. Moller as a driver of growth for other maritime companies in Denmark.[29] It also demonstrates a structural weakness in The Blue Denmark, as the suppliers' reliance on this single company is often still very strong.

In the eighteenth and nineteenth century, magnetic compasses were state of the art means of navigation, but in the twentieth century they were overtaken by new technologies. The gyro-compass was developed around the turn of the twentieth century, and it did not rely on magnetism to show the direction of north. After World War Two, various electronic means of navigation developed. Weilbach had neither the resources nor the know how to enter this market. The development of this technology was based on the military industry. In the long run, the magnetic compass lost is overarching importance to the navigators. Though still a legal requirement onboard, the magnetic compass is now long overtaken by electronic and satellite navigation. Weilbach ceased the production of magnetic compasses in the 1990'ies and the compass correction business also declined continuously from the 1960'ies onwards.[30]

## The shipping and shipbuilding crises of the 1970'ies and 1980'ies

The 1970'ies and 1980'ies was a time of shipping and shipbuilding crises. The economic stagnation of the period caused demand for seaborne to stagnate and in some cases even to decline. The crisis was not as strong in Danish shipping as elsewhere, but a gradual decline of the Danish flag took place in the 1980'ies. The maritime conglomerates of EAC and J. Lauritzen suffered heavily due to failed expansion strategies, and both closed down their shipyards in the 1980'ies or 1990'ies. A.P. Moller was the only maritime conglomerate that continued to prosper, and today the group is indeed a global shipping, oil and industrial giant.[31]

For the maritime suppliers, the shipping and shipbuilding crises were also discernible. However, there was a delayed in the crisis for the supply companies. Despite the decline of shipping freight rates in 1973-74, most shipyards and many maritime suppliers held large order books, and there was a considerable time lag from the time of ordering to the delivery of the ships. This time lack explains the continued growth of Weilbach in the 1970'ies, as evidenced by Figure 4. Ultimately decline also set in with Weilbach in the 1980'ies.

[29] Poulsen 2008b.
[30] Poulsen 2008b.
[31] Stig Tenold, 2006. *Tankers in Trouble: Norwegian Shipping and the Crisis of the 1970s and 1980s*, Research in Maritime History no. 32, International Maritime Economic History Association, St. John's Newfoundland; Sornn-Friese and Iversen; Hans Jeppesen, Svend Aage Andersen and Hans Chr. Johansen, 2001. *Dansk Søfarts Historie*, vol. 7, Gyldendal, København; Lange 1995.

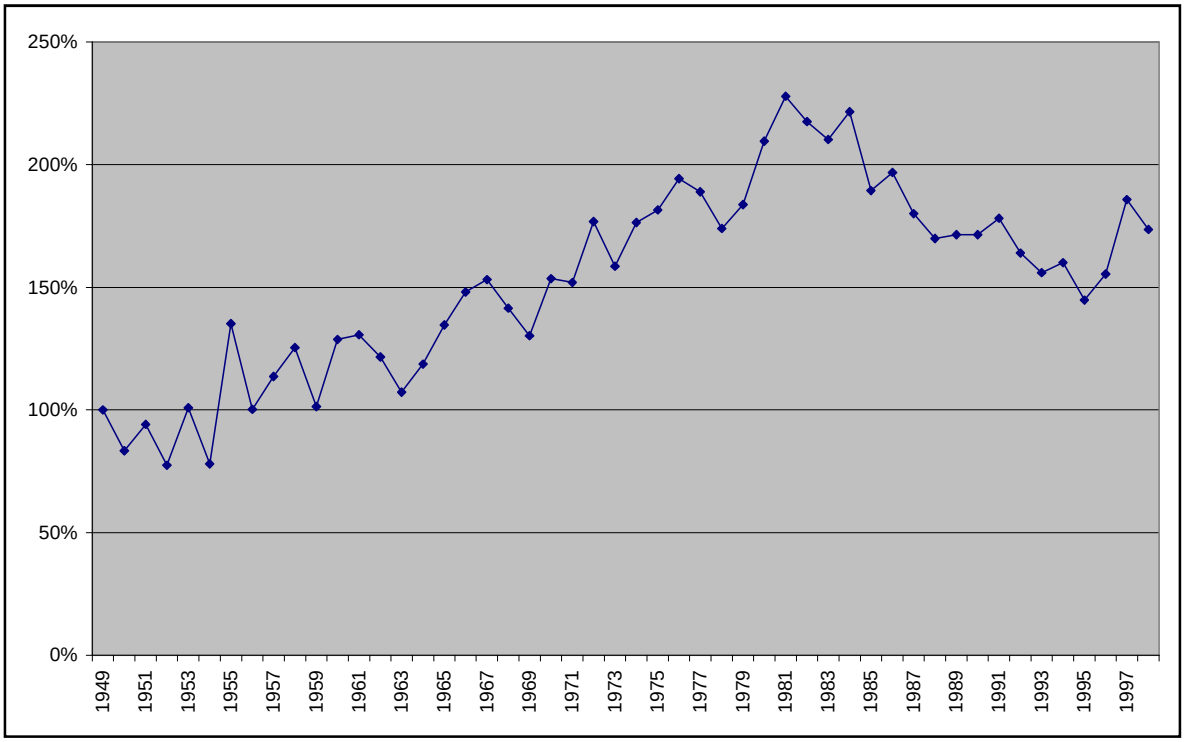


**Figure 4. Turnover in Weilbach, 1949/50-1999/2000 . Index 100 = 1949/50.**[32]

One shipbuilding market continued to prosper in the 1970'ies and 1980'ies, and that was the market for K/S-financed vessels (*Kommanditselskab* or limited partnership). Due to the Danish taxation regime, capital from outside the maritime industries was attracted to the investment in ships. The K/S projects quickly became very popular in Denmark as a means of deferring taxation. Hence, the K/S-ships filled the order books of many Danish shipyards for several years.[33] Furthermore, the K/S ships became important customers to the maritime supply companies. In particular Weilbach delivered both nautical charts and instruments to the expanding K/S-financed fleet in this period, and this explains the growth in Weilbach's turnover until the early 1980'ies.[34]

In the 1970'ies and 1980'ies, Weilbach entered a new market as a maritime publishing company. International maritime safety regulations were gradually tightened, following a number of serious maritime disasters. New rules and regulations, such as the Solas-convention (*Safety of Life at Sea*) and the Marpol (*Prevention of Pollution from Ships*), were introduced and continuously updated afterwards. At sea, mariners' needed access to updated information on the new regulations, and maritime publishers, including Weilbach, supplied the maritime libraries onboard the ships with the latest publications and regulations. In Denmark, Weilbach became the leading company in this field. Weilbach entered this field using the nautical chart department's long-lasting connections with the Danish shipping-companies. Based on the old customer-relations, it was relatively easy for Weilbach to expand into the maritime publishing business.[35]

[32] Iver C. Weilbach & Co. A/S: Regnskabsoversigt 1949/50-1999/2000, Palle Dyre, 2. september 2000.
[33] Poulsen and Sornn-Friese.
[34] Poulsen 2008b.
[35] Poulsen 2008b.

One last issue deserves mentioning, even though it did not have any great impact on Weilbach's business. That is the discovery of oil in the North Sea in the 1960'ies and 1970'ies. For many other components of the Blue Denmark, this was highly significant. The shipping company A.P. Moller got the licence for exploration and exploitation and established its own oil company, *Maersk Oil and Gas*. Furthermore, it diversified into related industries, such as supply services and helicopter operations. The offshore industry created large, new business opportunities, and many new companies entered the field. Not only did Denmark become self-supplied in terms of oil and gas, the industry generated an annual turnover of more than 8 billion kr. and employed approximately 6,700 people in the Esbjerg region of Denmark in 2002. [36] In other words, the offshore businesses added a completely new dimension to the Blue Denmark from the 1970'ies onwards.

## Maritime deindustrialization and the global breakthrough of Danish shipping, 1990-2008

In the late 1990'ies, maritime deindustrialisation, defined as the closure of the main shipbuilding industry, changed the nature of the Blue Denmark. For many years, the Danish shipbuilding industry had maintained a global market share of approximately 3 percent. However, around the turn of the millennium, most Danish shipyards closed down *inter alia* due to strong Asian competition. Danish shipping companies, the main customers at the Danish shipyards, transferred the bulk of their newbuilding orders to Asian shipyards in the late 1990'ies and early 2000'ies, as evidenced by Figure 3.[37]

The ramifications of Danish maritime deindustrialisation are still not clearly analysed, but it is evident that other components of The Blue Denmark have prospered over the last ten years.[38] Notably, Danish-controlled shipping has expanded massively. A global breakthrough of Danish shipping took place after 2000, and it was caused by a favourable combination of global growth, high managerial skills, maritime clustering and broad political support to the industry.[39]

For the Danish maritime suppliers, the structural changes in the shipbuilding industry obviously posed serious challenges. Could the suppliers maintain market shares, when the main shipbuilding centres relocated to Asia?[40] Weilbach certainly could. The company was generally successful in maintaining the old customers for nautical charts and maritime publications, the main Danish shipping companies. For Weilbach's nautical chart department and the maritime publishing business, the location of the shipyard was not important. Weilbach profited from the growth in the shipping companies, and as such stand as good example of a successful maritime supplier.[41]

---

[36] Morten Hahn-Pedersen, 1997. *A.P. Møller og den danske olie*, Schultz, Copenhagen; Morten Hahn-Pedersen and Morten Karnøe Søndergaard, 2005. *Afledt effekt af aktiviteter på Esbjerg Havn*, Fiskeri- og Søfartsmuseet, Center for Maritime og Regionale Studier, Esbjerg.
[37] Poulsen and Sornn-Friese.
[38] René Taudal Poulsen, 2008. *The impact of maritime deindustrialisation on the Danish maritime cluster: The internationalisation of the Danish maritime supply* industry, International Association of Maritime Economists' konference, Dalian, China. (Henceforth: Poulsen 2008a).
[39] Sornn-Friese and Iversen.
[40] Poulsen 2008a.
[41] Poulsen 2008b.

Interestingly, Weilbach still has a master mariner as manager. Since 1908, seven managers have headed the company, and all of them had a nautical experience as master mariners. They went to sea before embarking on a career with Weilbach. This indicates that mariners' know how is still highly valued in the maritime supply industry at the management level.[42]

## Conclusion

The Blue Denmark has a long history, and the business of Weilbach is a useful means to study it. Covering more than 250 years of history, Weilbach has depended on The Blue Denmark and faced many challenges that were common to Danish maritime suppliers.

Without new maritime know how, no maritime supply company can survive in the long run. Throughout 250 years, mariners have played a crucial role to Weilbach's business. Iver Jensen Borger and other members of the Weilbach family went to sea before embarking on a career in the maritime supply industry ashore. Thus, experience and knowledge from the sea was transferred to the shore organisations. Indeed, the Weilbach story consistently shows the importance of maritime know how to the maritime suppliers, and even today the company is led by a former master mariner. Within the constraints of this paper, it has not been possible to examine the career paths of the managers in other maritime supply companies. Ultimately such a study would allow for a more thorough assessment of sources of maritime know how and the contribution of this know how to the competitive advantages of maritime suppliers.

The Blue Denmark has a long history, but growth in Danish shipping and shipbuilding was not always simultaneous. In several periods, ship-owners expanded irrespective of the development in the Danish shipbuilding sector. On the other hand, growth of shipbuilding has depended on growth in Danish shipping to a high extent. This indicates asymmetrical dependencies within The Blue Denmark, where one sector, shipbuilding, was more depended on the other, Danish shipping, than *vice versa*. Maritime suppliers have certainly also profited from growth in Danish shipbuilding, but Weilbach and other suppliers have also succeeded in expanding despite problems in the shipbuilding sector. Notably, Copenhagen compass-makers were able to expand businesses in the 1780'ies and 1790'ies despite the decline of shipbuilding in the capital. They did this mainly due to the growth of Danish, overseas shipping. Similarly, Weilbach and many other maritime suppliers have prospered since the 1990'ies despite the process of maritime deindustrialisation and closure of most of the shipbuilding industry. Weilbach and probably also many other maritime suppliers have relied heavily on the growth of Danish-owned shipping, and it has prospered not least due to long-term and very stable customer relations in the twentieth century.

*The maritime cluster* is a term used very commonly by maritime administrators, politicians and shipping representatives. Not always clearly defined, the concept is used in many contexts and for many purposes. Obviously, historians should be critical to towards the cluster concept, which may be used by some groups for political purposes. Nevertheless, the story of Weilbach and The Blue Denmark clearly shows that maritime and business historians can add new dimensions to economic history by using a cluster perspective. Knud Pontoppidan was certainly right in 1987, when he said that The Blue Denmark is a complex and interesting industry, worthwhile more attention.

[42] Poulsen 2008b.