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Wooden shipbuilding at Dordrecht

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BIJ EEN VERTREK

Binnen de redactie van de Mededelingen lijkt zich de U allen waarschijnlijk welbekende geschiedenis van de tien kleine negertjes te herhalen. Na drs. A.H. Huussen heeft nu ook dr. J.R. Bruijn besloten het redactieteam te verlaten. De heer Bruijn is jarenlang nauw betrokken geweest bij het wel en wee van ons tijdschrift. Tot 1967 voerde hij de redactie samen met mejuffrouw drs. A.M.P. Mollema, daarna, tot 1970, deed hij dat met de heer Huussen; in 1970 voegde drs. L.M. Akveld zich bij het redactionele team. Onnodig te zeggen, dat de heer Bruijn gedurende deze jaren zeer veel tijd, kennis en moeite in het redactiewerk voor de Mededelingen heeft geïnvesteerd. Namens U allen breng ik hem daarvoor mijn welgemeende dank over.

Niettemin worden wij nu geconfronteerd met de moeilijke situatie, ontstaan door het vertrek van twee leden van de redactie. De Mededelingen vormen binnen onze vereniging een uiterst belangrijk element, dat met zoveel mogelijk zorg omringd dient te worden. Het bestuur heeft goede hoop de ontstane vacatures in samenwerking met de heer Akveld zo spoedig mogelijk te zullen opvullen.

De voorzitter.

ARTIKELEN

Wooden Shipbuilding at Dordrecht. 1)

Dr. R. W. Unger

I. Origins of the Industry.

In the later Middle Ages Dordrecht sat at the point where inland water transport met sea-going transport. From the beginning the town served as a transshipment centre. The inland waterways gave excellent connection with the industrial and commercial towns of Flanders, with the growing towns of Brabant, with much of Germany and also with commercial centres along the IJssel and in Holland. By the fourteenth century Dordrecht was a trading town of some importance. It was the only town in Holland that was able to draw the attention of foreign traders. 2) The position of the town was so good that it drew the attention of governments as well. The counts of Holland thought Dordrecht had the potential to be another great international port, like Bruges. So from the late thirteenth century the government of Holland embarked on a policy of favouritism to Dordrecht. Trade there was promoted at the expense of all other ports in the county. In 1299 Count Jan I granted Dordrecht the so-called 'stapelrecht'. In 1355 Count William V revised and expanded the regulations to include 'Maasrecht' as well. This granting of privileges started with Count Floris V in 1276 and his successors were even more vigorous in aiding the town. The 1299 grant required that all goods which came down or up the rivers Lek or Merwede had to be sold at Dordrecht. There were no exceptions. Modifications were made in the 'stapelrecht' until in 1355 it was extended to include all goods which went upstream or downstream on the Rhine, Maas, Waal, IJssel, Lek or Merwede and with only minor exceptions. In essence the law required that all goods going in or out of Holland by river had to be exchanged at Dordrecht. The privilege was expanded and renewed again and again by different counts through the fourteenth and fifteenth centuries.

These counts did not act out of compassion. Jan I had enjoyed the loyalty of Dordrecht and so the 1299 grant was something of a reward. More than that the counts were interested in assuring their income from tolls. By forcing all trade through Dordrecht they could tax it more effectively and minimise smuggling and evasion. At the same time they were attacking the concentration of trade in Flanders and Brabant, the enemies of Holland in the fourteenth century. The grants brought almost immediate opposition from other towns in Holland. Despite their vigorous protests, sometimes even extending to violence, the counts adhered to the policy of favouring Dordrecht. The importance of toll income made the counts consistent defenders of the privileges. 3) Dordrecht performed two functions: it was a regional distribution point and an entrepot for goods from all over Europe. Various governments, no matter their efforts, were never able to make the latter very important. English merchants preferred the towns of Zeeland while German Hanse merchants, despite a short stay at Dordrecht in 1359 and 1360, found their traditional Bruges factory better suited to their needs. 4) Goods such as Prussian grain and Scandinavian wood and English wool found their way to Dordrecht however to be traded there for the goods brought by river from the German hinterland. The 'stapelrecht' made Dordrecht the market for Rhine wine and that was the most important good in terms of volume and value for the town. Wood was unquestionably in second place. As early as the Carolingian period wood may have been shipped down the Rhine and by the fourteenth century the trade was well organized with large floats of unsawed wood being brought into Dordrecht. The wood was from Westphalia but also from as far away as Bavaria. It was largely hardwood. There were other goods traded of course including grain, herring and salt from local sources and from some distance away. 5)

In the thirteenth and fourteenth centuries Dordrecht was in an ideal position for the development of a local shipbuilding industry. Raw materials were available in large quantities. The hardwood, the most important component of any ship, had to pass through Dordrecht by law and much of it was sawed and prepared for sale in the town. Dordrecht shipbuil-

ders could get their wood then at relatively low prices. Local shippers exploited the opportunities created by the 'stapelrecht' and 'Maasrecht' and they need men at hand to build and repair their vessels. The ships from other parts of the Low Countries and from overseas also formed a market for repair work. The counts of Holland in protecting Dordrecht trade protected shipbuilding since they gave Dordrecht shipcarpenters to some degree a captive market. Dordrecht shipbuilding may date from the earliest years of the town, that is from the eleventh century. Apparently shipbuilding expanded up to the end of the fourteenth century and continued throughout the following years with the construction of sea-going vessels only finally abandoned in 1871. The industry survived for many years despite economic and geographic pressures and it survived by constant adjustment, by changing character.

The Dordrecht industry is an example of Dutch shipbuilding, an industry always important to the economy of the Netherlands, but also the example with the longest history stretching from the Middle Ages to the end of wooden construction and beyond. Dordrecht shipbuilding was also significant because it was subject to the most extensive guild regulation of any Dutch shipbuilding industry. Dordrecht was second only to Utrecht in the scope and effectiveness of guild power both in the trades and in town government. Shipbuilding included a number of industrial and commercial operations and was in turn tied to many other economic activities at Dordrecht. The complex history of Dordrecht shipbuilding and related operations requires an extensive examination but at least from certain data it is clear that the industry passed through a series of phases. The phases are all the more significant because they do not fully conform to the general pattern of development of Dutch shipbuilding and the exceptions are important. Also important is the fact that the changes at Dordrecht coincide with the changes in the policy of the town government, illustrated both by decisions of the shipcarpenters' guild and of the town government itself. The industrial development or lack of it is then inseparable from the history of legislation.

II 1300 - 1600

The trade expansion of the Middle Ages, first without and later with the aid of government protection, created work for Dordrecht shipbuilders and generated large enough numbers to make possible the formation of a guild, and by as early as 1300. In the fourteenth century Dordrecht probably experienced her greatest expansion with a population of about 10,000 in 1354. The guilds which had often been informal associations of men in a common trade became official institutions of government in 1367. Their rules and earlier grants of status were affirmed. More than 40 guilds were granted official status and the shipcarpenters' was prominent among them. Their patron saint was St. Pancras and they were committed to the maintenance of the St. Pancras altar in the 'Groote Kerk'. They like the other guilds pressed for a greater voice in town government and through the last years of the fourteenth and the first years of the fifteenth century their power to affect decisions increased.

Because of the growth of commerce it was possible to have a high degree of differentiation in trades and this was reflected in the separation of trades into a large number of different guilds. Significantly for shipbuilding by 1376 both the sawers and the wood sellers were separated from the shipcarpenters, even though the sawers had been in the shipcarpenters' guild as late as 1351. 6) The separation while convenient for administrative purposes assured protection for the specific interests of each group and effectively prevented the integration of the principal activities in shipbuilding for many years. The fourteenth century rules of the shipcarpenters' guild reflected the expansionist nature of the industry. Shipcarpenters were not encumbered by extensive regulation. In fact there were hardly any limits on them. Like all guilds the shipcarpenters' enjoyed a monopoly and only guild members could exercise the trade. The rules for the guilds were made by the officers and guildbrothers themselves. The decision to have limited regulation then was knowingly made by the shipcarpenters themselves. Members had to attend meetings of the guild and violation of guild rules were to be judged by the officers. But beyond that the consuming interest of the shipcarpenters was their jacks. These were windlasses used to raise a ship onto a wharf or to move a ship under construction or to move large pieces of wood. The guild held a monopoly of these devices. Only those

owned by the guild could be used in Dordrecht. Guildbrothers were given equal opportunities to rent the jacks from the guild, paying a rent to the common chest and having to return them in good condition. 7) Other than conforming to the rules about use of the jacks shipcarpenters were free to go about their business as efficiently and effectively as possible.

The beginning of economic decline was marked by the St. Elizabeth's flood of 1421. That inundation shifted the waterways and made it difficult to use a number of established routes. The change favoured ports downstream, especially Rotterdam, at the expense of Dordrecht. Changes in the 'stapelrecht' and 'Maasrecht' worked against Dordrecht as well. Charles V finally conceded to the persistent demands of other Holland towns and in 1540 and 1541 he limited and modified the privileges. Among other things he freed trade in a number of goods and freed trade on the river IJssel. From that point on the privileges deteriorated. All Rhine wine still had to pass through the town but extensive compulsory shipment of a wide variety of goods through Dordrecht was at an end. The 'stapelrecht' did not finally end until 1795 but by 1601 it was not very important to Dordrecht or to the rest of Holland. At the same time Dordrecht trade was hurt by the expansion of the Antwerp market and the success of that Brabant town in attracting international trade by land and sea. The beginning of expansion at Amsterdam worked to the disadvantage of Dordrecht in the same way.

The increasing size of long distance cargo carriers made it more difficult for them to visit the port of Dordrecht. The result overall was a contraction of trade and of the size of Dordrecht itself. In 1514 the population was about 6500 and recovered to as much as 10,000 by mid-century. But that growth could not compare with Rotterdam. Dordrecht industry contracted. The number of brewers fell from as many as 30 in 1500 to only 15 in 1555. Shipping suffered too but merchants were still able to draw on their traditional connections along the upper Maas and the Rhine. They also enjoyed a certain advantage in the capital which they had generated over the years and which they could use in the wine and wood trades, both of which required sizeable investment in inventories. In 1555 when 492 men reported their trade in a tax assessment there were only seven shipcarpenters. A tax of 1594 showed a rise in their number to 19. 8) There may then have been a revival of shipbuilding after the Revolt but overall the fifteenth and sixteenth centuries was a time of contraction. It was also a time of contraction in the size of vessels built. More work relatively was done on inland vessels and on repair to those and other ships visiting the harbour.

While business for shipcarpenters decreased the rules and regulations they had to follow markedly increased. The guilds no longer took an active interest in extending their role in town government. Rather in the case of the shipcarpenters' guild concentration was on the internal operation of the guild and on vigorous defense of any and all guild privileges. The drive throughout the fifteenth and sixteenth centuries was toward exactness and more careful regulation of all aspects of guild life and with it the activities of shipcarpenters. The meetings of the guild were regularized. And they served as a market for unemployed carpenters by bringing them together with masters at fixed times and with established hiring procedures. The meetings were subject to more strict rules. Misbehaviour, causing a disturbance, insulting a fellow member, attacking the officers for the performance of their duties were all subject to punishment by the guild. The guild was required to keep more extensive records of everything especially of any financial dealings. The guild had to maintain its altar, be sure that there were sufficient candles on it and that masses were said at it. Each member had to visit the altar at least once every Sunday. Of course after the Reformation those requirements disappeared.

There was a set of officers chosen by a formal vote and with fixed duties and with the responsibility for the efficient and orderly operation of the guild. Funerals of members, their wives and children had to be attended by all members wearing proper clothing; that meant 'tabbert en caproen', a long coat and cap used at all solemn occasions. And if they were worn while working the guildsman was punished. The day of a funeral was an enforced day off. Certain holy days were also days off. Anyone working on those days was punished by the guild. In 1467 the shipcarpenters also started the practice of making payments to guildsmen who were too sick to work. Working at night by candlelight or firelight was prohibited because the town was afraid of an outbreak of fire. Having 'tab-

bert ende caproen' was even a requirement for entry into the guild. The proceeds from all the fines plus an annual fee payable by all members and by apprentices went to the maintenance of the altar, that is up to the Reformation. 9) Though these rules on the operation of the guild and on the social activities of guildsmen were important to the lives of members and impinged on their actions there was more important legislation which dealt directly with their business operations.

Master status in the guild meant the right to contract to do shipbuilding work, either new work or repair. All other workers could not agree to take on jobs and so were always employees at best. Thus the guild could limit the potential shipbuilding operations by limiting the number of masters. The monopoly of jacks remained. Everyone in the town was prohibited from making jacks or any lifting device unless at the specific request of the guild and for the use of the guild. Entrance to the guild was made more difficult. Natives were charged lower entry-fines than people from outside of Dordrecht but in general the tendency in the fifteenth century was to charge higher entry-fines. The town had to step in and set maxima for such fees. The next step in the limitations of membership came in 1587 when the guild required a rather complex proof for admission to master status. It was the most extensive proof required by any Dutch shipcarpenters' guild. Many of them did not even bother with such a requirement. Without completing the proof a shipcarpenter could not work as a master. The proof had to be done to the satisfaction of the guild officers who were weighed down with increasing responsibilities. 10) In general the guild became more legalistic, taking more and more cases to the courts of the town or appealing directly to governments. The officers had to personally pursue these cases, petitions and negotiations. Cases covered relations with other guilds and with the members of other guilds, the development of new shipbuilding facilities, the proper payment of dues and fines by members, the enforcement of the guild monopoly and a mass of other matters. 11) The increase in legal business was only the logical outcome of the expansion of regulation.

The shipcarpenters tried throughout the sixteenth century to infringe the monopoly of the wood dealers. These efforts were vigorously and successfully resisted by the guild of wood sellers. The latter were always afraid of shipcarpenters. After building a ship the carpenter often had wood left over and he then liked to sell it at a substantial profit. Shipcarpenters were important customers for the wood dealers and they did not want those men buying on their own. The solution to this jurisdictional dispute was to allow shipcarpenters to join the guild of wood sellers. That arrangement was possible at Dordrecht but in his second guild a member had only the right to pay dues. He had no voice in decisions and could not hold any office. The wood sellers tried to get the town government to require that new members give up their first guild and with it their first trade, in this case shipcarpentry. The prohibition of shipcarpenters selling wood dated at least from the fourteenth century. And the wood sellers actively prosecuted any shipcarpenter who violated that rule. An agreement was reached by the two guilds in 1583 which favoured the wood dealers. Shipcarpenters had to sell any wood left from building a ship to a wood dealer. The only way shipcarpenters could sell it themselves was by joining the wood sellers guild and paying dues to that guild. It was in essence the same agreement which had been reached in 1437. The wood sellers appear to have been slow in admitting shipcarpenters to their ranks and so the court cases and the disputes continued into the seventeenth century. 12) The wood sellers effectively prevented shipcarpenters from extensive expansion into wood dealing. And as a result the potential profits from shipbuilding and the ability of shipcarpenters to accumulate capital were limited. The separation of trades, imposed in a period of expansion, continued despite relative decline.

Overall the great increase in legislation of the shipcarpenters' guild, generated in an atmosphere of stagnation, had the effect of confining shipbuilders. At the same time the mass of rules and the strenuous efforts of guild officers to defend privileges meant the continuing existence of those fourteenth century institutions associated with shipbuilding.

III 1600 - 1800

In the seventeenth and eighteenth centuries Dordrecht failed to participate in the most rapidly growing sectors of Dutch commerce and industry. The herring fishery required

ports closer to the sea. Trade to the Indies, both East and West, was confined by law to certain towns and Dordrecht was not among them. The expansion of whaling in the midseventeenth century caused some stir in Dordrecht but nothing like that in northern Holland. Most important of all Dordrecht was almost completely excluded from the 'moederhandel', the shipment of Baltic grain to Iberia and the Mediterranean for salt and sub-tropical goods, by the competition of towns in northern Holland. 13) The result was relative decline. Dordrecht shipping and with it shipbuilding fell further behind other towns in Holland in quantity and variety of business. The wars of the seventeenth and eighteenth centuries, the fighting in Germany, in nearby Flanders and Wallonia and the problems of trade to the southern Netherlands all certainly damaged the prospects for Dordrecht.

The town could not completely avoid the prosperity of the seventeenth century however. And there was an absolute rise in goods shipped and also probably in the number of ships built. The expansion of arable land by the reclamation of land near Dordrecht expanded the local market. Harbours were expanded and a crane was set up for canting ships to aid in repair and caulking. This 'kielpaal' was first mentioned in an ordinance of 1651 and was owned by the town. 14) It reflected the increasing importance of repair work to local builders as well as the increase in that business.

The general expansion of the seventeenth century and the stagnation of the eighteenth both allowed economic activity to be increasingly centralized in the two largest ports of the Republic, Amsterdam and Rotterdam. The growth of the two at the expense of smaller towns was obvious through the eighteenth century. The shift of the distribution centre for south Holland from Dordrecht to Rotterdam had already occurred by 1600. In shipbuilding Dordrecht shipcarpenters like all others in the Republic had to face the intense competition of the Zaanstreek industry. This highly organized and integrated industry grew rapidly in the seventeenth century and centralized the construction of sea-going ships along the banks of the Zaan. The situation changed about 1720 as Zaanstreek shipbuilding contracted rapidly and collapsed completely by the end of the century. Through the seventeenth and eighteenth centuries it was impossible for Dordrecht builders to compete in the construction of sea-going ships. Moreover, local shippers were overwhelmingly interested in inland vessels and so the Dordrecht industry specialized in building and repairing just those ships.

The decision was made even more certain by the loss by Dordrecht builders of their relative advantage in access to wood supplies. Wood from the Rhine Valley became less significant relative to wood imported from Norway and the Baltic. Even hardwood was increasingly brought in from the North. Germany became a net importer of wood. That in turn implied a growth in the importance of ports on the Zuider Zee in the wood trade. Dordrecht had long been the site of regular wood auctions. Amsterdam developed a wood market in the early seventeenth century but more important than that was the large one in the Zaanstreek beginning in the mid-seventeenth century and reaching its peak in 1716. Significant quantities of hardwood from the Rhineland found their way directly to the Zaanstreek avoiding the market in Dordrecht altogether. If that was not enough Rotterdam in the eighteenth century developed its own wood market. While as late as 1699 Rotterdam merchants and shipbuilders were buying their wood at Dordrecht that was decreasingly the case. 15) The loss of those and other customers meant a decline of Dordrecht as a centre for the wood trade and also meant that shipbuilders in other towns could get shipbuilding wood in quantities and at prices like those of Dordrecht.

The expansion in guild regulation in the fifteenth and sixteenth centuries was a reaction to the relative decline of the industry. In the following two hundred years the attitude did not change. Guild regulation was made even more stringent and comprehensive. The guild jacks continued to consume the interest of the shipcarpenters' guild. All the rules dating from 1397 were regularly repeated and expanded. The guild officers checked any new jacks to be sure they conformed precisely to the required specifications. During each year the guild officers had to check the measuring devices used by guildbrothers to be sure they were accurate. The officers were also to judge any complaints against guildsmen about the quality of their workmanship. An employee could not leave his employer without the permission of that guild master. Meetings continued to be regulated with all the usual punishments for any disruption. Moreover, they were made secret in 1627 with members penalized for disclosing anything that went on during the meeting. Workers from outside

the town, skilled tradesmen who were not guild members, were prohibited from working on ships at Dordrecht except under the most exceptional of circumstances. The guild was also apparently reluctant to allow new members to join, especially from other guilds. Entry-fines were raised. New members had to take an oath immediately and in front of the mayor and council of the town. The regulation of the sickness fund became more extensive and clearly the guild was trying to be sure that all members paid in full so that income for the fund would at least keep up with payments out of the fund. The funerals of members still had to be attended by all guildbrothers, properly dressed. There was increasing difficulty in having brothers comply. Attendance was excused after 1684 for any shipcarpenter working on a sea-going ship. 16) Obviously this was rare and important enough for the guild to take this unique action to try to promote such work. And there were many more regulations than that. The topics covered increased as well.

The rules show that control of the guild was increasingly in the hands of a small number of men. They used that power to concentrate work in their hands as well. Only masters could do repair work. The guild monopoly was regularly reasserted and within the guild the rights of masters to be the exclusive contractors for work was strongly enforced. These masters were the men who repeatedly held guild office and enforced the rules which worked to their advantage. More of the business of the guild was handled by the officers meeting alone. General meetings attended by all members became less common. 17) The actions of the town government did nothing to stem this oligarchic trend. In fact they helped the masters to centralize the business of shipbuilding into their own hands. In Rotterdam the town chose to promote shipbuilding in the years around 1700 establishing a new harbour for shipbuilding. The area was developed at government expense and wharves were offered to shipcarpenters at reasonable prices along with low cost mortgages. The same procedure had been followed in the first years of the seventeenth century but with little success. The second time the result was a revived shipbuilding industry in Rotterdam. Dordrecht tried similar assistance. Government-owned slipways were established along the 'Spuihaven' in 1583, rented to master shipcarpenters and used for repair work. The guild operated the wharves and part of the income from rents went to the guild. Since the town and guild controlled the location of shipbuilding activity they could force builders to move their operations to these new 'hellingen'. The renter had to supply the tools, jacks and capstans. The jacks had to be rented from the guild and returned along with a new one for about every 15 rented on long term. The goal of the town was to supply efficient repair services to shippers, both domestic and foreign, to cut down their turn around time and thus make Dordrecht an attractive port. The 'kiel-paal' and associated equipment had the same purpose for larger ships. There were only three 'hellingen' though and they were only useful for repairs. While the development seems to have been successful through the seventeenth century the falling rental income in the eighteenth shows that they were of decreasing value. 18)

The most extreme act of government aid to local shipcarpenters was the requirement that all native shippers had to have their ships built and repaired at Dordrecht and therefore by Dordrecht shipcarpenters. In 1657 all shippers with licenses to operate regular services from Dordrecht were made subject to the requirement. It was expanded in 1698 to all Dordrecht shippers. No one could enter the shippers' guilds unless he owned a vessel built at Dordrecht. Violation was severely punished and as with all other privileges the shipcarpenters' guild pressed for complete enforcement. To get this restriction the shipcarpenters had to agree to rapid building and repair work of the highest quality so that shippers would not suffer a competitive disadvantage as a result. In the case of Dordrecht this prohibition led to retaliation by other towns. That in turn led to a controversy over who in fact would benefit from such a rule. A number of shipcarpenters petitioned the town government claiming that the only beneficiaries would be the owners of slipways, the masters in the guild, since they were the ones who get the work. Retaliation by other towns on the other hand would mean unemployment for the rest of the guildsmen. The logical outcome would be increased centralization of work in the hands of a few. But the officers of the guild had the support of other tradesmen such as block-makers, ropemakers, smiths and sailmakers who wanted a protected market. The petitioners pointed to the problems of enforcement which arose in 1655 when the first efforts to confine native shippers had to be abandoned. But the town government would not be

moved. 19) The government was again faced with hard times and such restriction was the only method they saw open to them to even maintain the position of Dordrecht as a centre of trade.

The efforts of government and guild appear to have arrested the deterioration of shipbuilding. Local carpenters could build special vessels if called on to do so. A Dordrecht builder, Jacob Spaans, constructed a 60-gun warship, 'Hercules', during the Fourth English War. Such construction was rare. Of the 24 ships reported to have been built by the Schouten wharf between 1728 and 1790 only seven were of more than 100 feet in length, and almost all of the seven were built after 1771. Up to the last years of the eighteenth century the Dordrecht industry was dominated by building smaller vessels, especially vessels for use on inland waterways. The wharves themselves were small, the 'hellingen' were not large and located on a canal which did not allow access for sizeable seagoing vessels. They could not compare apparently with the new wharves built at Rotterdam in the early eighteenth century which were 180 feet long and 80 feet wide. The number of shipbuilders operating at Dordrecht fell as well. And there was an increasing tendency for them to form partnerships, usually with family members, so that the number of functioning wharves fell even more dramatically. The guild could boast around 120 members in about 1660. But the number of men contracting for the construction of new ships was much lower. In 1662 and 1663 a total of 17 builders won contracts for a total of 54 vessels. The vessels were almost exclusively small, one half being described as 'cromsteven schuiten'. The pattern of centralization had already been established. Three of the 17 builders constructed 40% of the ships. And the pattern continued. In 1718 and 1719 contracts for only 23 vessels were drawn. The ships were built by nine groups, four of those being partnerships so the total number of builders was 12. Just two groups accounted for nearly 40% of new ships constructed. And again small vessels dominated the list. By 1786 and 1787 the number of contracts for new ships had fallen to just 13 but there were still nine groups and therefore presumably nine shipbuilding wharves still in use. The largest ship mentioned was a 'wijschip' of only 70 feet in length. The number of wharves in 1740 may have been as high as 20 but most were small, so small that they could take on little more than repair of smaller vessels. 20)

IV The Nineteenth Century.

The revolution in 1795 and related political changes dramatically altered the situation for Dordrecht shipbuilding. The town government had protected the industry and kept it from falling on harder times. After 1798 the town could no longer exercise that type of protection. All restrictions on trade and industry were abolished as were all the guilds. So from the first decade of the nineteenth century protection as well as limitation of shipcarpenters through the guild disappeared. The guild itself was already rather weak. For example, it took the shipcarpenter, Pieter Gips, only six years from the time he became a master to rise to the highest office in the guild. And Gips was an opponent of the guilds. Obviously there was a shortage of talented new men. That was by no means the only sign of weakness. The town then had to withdraw completely from any policy on shipbuilding through the guild or through any medium. All control over shipbuilders on the islands just north of the town in villages such as Ablasserdam and Zwijndrecht were abandoned. The guild had been the agent of such control. The government of Dordrecht finally in 1831 bought the rights to the 'hellingen', paying a monthly rent to the former members of the shipcarpenters' guild and using the land for houses. 21) Shipbuilders then were left unaided by local authorities but also left to make their own decisions. Freedom did not bring an immediate boom to Dordrecht shipbuilding. The industry expanded only under protection, this time of the national government. The importance of Dordrecht shipbuilding in the nineteenth century was more apparent than real. But still after some three or four centuries of commitment to the construction of smaller vessels and to repair work, at least two builders at Dordrecht turned their backs on that tradition and embarked on the construction of sea-going vessels of the largest type and the latest design. It was unquestionably a conscious decision. And it was made in difficult times. From 1813 to 1828 of 83 vessels averaging 400 tons built in the Netherlands only six were built at Dordrecht. 22) In those years the town was still recovering from the disastrous Napoleonic period which decimated the domestic merchant fleet and disrupted

river trade. Shipbuilding did not thrive but it did pass through a new phase, developing in an entirely different way from the past and precisely because of the deterioration of the past.

At Rotterdam shipbuilding was in the hands of a few men. They promoted that by integrating shipbuilding and wood dealing. In some cases it was hard to tell which was more important to them. Shipbuilders became involved in a number of related activities such as trade, credit dealings, owning parts of ships and so on but wood dealing was the natural first avenue of diversification. To some degree the same pattern was repeated at Dordrecht. With the disappearance of the wood sellers' guild in 1798 along with all the other guilds shipcarpenters were free to trade in wood. The town had already given up trying to prevent the combination of wharfs so builders could assemble a sizeable area for construction. The general concentration of wealth into the hands of a few, it not being unique to shipcarpenters, was obvious from the luxurious townhouses built in Dordrecht in the eighteenth century. 23)

The Napoleonic period drove out of business many of those builders who had not moved toward diversification, integration, extension. That left two builders capable of building large vessels: Schouten and Gips. There were some five other wharves devoted to the long-standing tradition of building and repairing river craft. Little is known about the firm of Schouten. Ships were built by the firm from 1709 and perhaps before. They were involved in the wood trade on an international basis. Jan Schouten took over the business including the shipbuilding wharf on from his father in 1807 at the age of 22. In the last years of the eighteenth century his father had started to build large sea-going ships and the son was even more committed to that practice. The problem was that he like almost all Dutch builders after 1815 returned to the well-known designs of prewar years and the vessels he built were exactly like those built at Dordrecht fifty years before. 24) But with government protection the firm did grow and improve its product over the following forty years.

The firm of Cornelis Gips has the advantage of having a well-documented company history. Cornelis Gips set up his own shipbuilding wharf in 1819 based on the inheritance of his wife, the daughter of a Dordrecht shipbuilder. Cornelis' father, Pieter Gips, had owned his own shipbuilding wharf since 1794 but the operation had not proven profitable and he had to take in a partner who could supply needed capital. Cornelis Gips then had no choice but to strike cut on his own, that is with the aid of his wife's money, a mortgage and his own inheritance on his father's death in 1828.

In 1825 Cornelis built his first large sea-going ship. It was a difficult job since his wharf had always been used for building inland vessels. But he was obviously convinced that innovation was needed for the business to succeed. His next contract was for a steamboat. Schouten had already built the first Dordrecht steamboat in 1825. Contracts followed quickly for Cornelis Gips and though he built no sea-going ships from 1830 to 1834 because of the revolt to the south and the blockade he returned as soon as possible to larger vessels. For more space in 1830 he bought the wharf next to his. He was doing well since he had the money to finance that purchase as well as the construction and therefore expensive ships. This did not prevent him from building a smaller ship now and again especially in hard times to keep the wharf occupied. He invested in shares of ships, at first just selling the shares when the vessel was launched but increasingly holding them to draw the income. That meant increased capital requirements, requirements which he was able to meet. In about 1840 a new firm, Cornelis Gips en Zonen, was formed incorporating his four sons into the business. In 1835 Cornelis took on the management of a wharf in Schiedam but immediately handed operation of it over to his third son. On the death of Cornelis Gips in 1843 management of the firm was taken on by the eldest son, Pieter, in cooperation with his brothers. And though temporarily subject to some difficulties it was at that point a successful integrated shipbuilding firm specializing in the construction of efficient ocean-going vessels. 25)

The growth and development of both the Gips and Schouten firms in the 1820's, 1830's and 1840's depended heavily on orders for East Indiamen. Trade to the East Indies was protected and regulated by the Nederlandsche Handel Maatschappij (NHM), a government controlled company which chartered ships to sail to the Indies paying higher than prevailing freight rates. King William I founded the company as a way to revive Dutch commerce and shipbuilding. The king first tried direct subsidies to Dutch shipbuilders, a fee of

so much per ton for all ships over 300 tons. That continued from 1824 to 1830. Import of foreign-built ships was also restricted from 1819 to 1850. More important though was the NHM chartered in 1824.

Since Dordrecht shipbuilders were supplying this special market they had to keep up to NHM standards and also to stay below 800 tons since above that point shipping rates fell. Speed was not important because of the cargoes carried and because there was a sailing only every six months. Orders for ships depended on the approval of the NHM and the first thing done by a group of owners when they decided to build a ship was to send a representative to The Hague to get a government guarantee of two return voyages to the Indies for the vessel. In a good position to trade with the Indies, more easily reached by East Indiamen than Rotterdam or Amsterdam and favoured as a smaller port by the NHM to 1848, Dordrecht got a relatively large share of shipping contracts for the East and that meant a significant share of shipbuilding contracts.

Between 1826 and 1852 some 40 East Indiamen were built at Dordrecht. That was combined with other work. The Schouten wharf for example from 1826 to 1852 built a total of 26 vessels for the merchant marine. 26) The result was overproduction and the NHM was forced at times to change its procedures. That could only increase the cyclical nature of orders for ships. In 1843 the Gips wharf employed only 34 men and the Schouten wharf 52. On the other hand by 1855 the two firms in conjunction were renting new space from the town at 'Willigenbosch', an area not used for shipbuilding since the late eighteenth century. And again by 1858 there were only 36 men working on the Gips wharf. 27) A general change in government policy around 1850 toward freer trade aggravated the situation. The change worked to the disadvantage of Dordrecht shippers who had been prospering under the protective blanket of government controlled trade. The shippers and shipbuilders of the town found themselves unable to compete in an open market. Certainly the shipbuilding firms could run down the capital built up in the 25 years of growth but they were now exposed to the extreme changes in demand for new ships which were typical of the second half of the nineteenth century.

The Gips firm had an important advantage in such a market in the long association with the shipping firm of Gebr. Blussé. Members of the Blussé family were involved in shipping combines buying ships from the Gips family from the 1820's. The firm could expect not only to build the ship but also to supply all the masts and spars and any extra wood needed. In all likelihood the firm could expect to get the contract for any repairs too. Cornelis Gips took shares in some of the ships, becoming a partner of Adolph Blussé. The ties between members of the Gips family and A. Blussé and P. Blussé van Oud-Alblas may have stemmed from shared liberal political views dating from before 1795. The Blussé combines were deeply involved in taking advantage of the lucrative trade to the Indies and that in turn meant a stream of orders for East Indiamen for the Gips wharf. And the Blussé organizations were the greatest buyers of ships in Dordrecht in the nineteenth century. 28)

It was the connection with the family Blussé which created the opportunity for the Gips firm to establish itself as a technically superior builder. The firm of Blussé wanted to have a clipper, that type of fast ship developed in America. Dutch ships were designed as they had been since the sixteenth century sacrificing speed for hold space and small crew. Certain trades demanded speed though and the Gebr. Blussé wanted to participate in those trades. By 1850 they had already been investigating the design of American clippers. In 1853 they were able to get a model of an American clipper, originally from a firm in New Jersey. Gips en Zonen was able to convert the model into a ship, the 'Kosmopoliet I', completed at Dordrecht in 1855. Dutch builders had been trying out many of the features of the new design in their own ships. And shippers had been buying clippers from overseas. Still the job for the Gips firm was not an easy one, scaling down from the model of a vessel of 1200 tons to a ship of under 800. It is likely that she was the first clipper built in the Netherlands and though a medium and not an extreme clipper it is certainly true that she impressed shippers enough to make the type popular in the Netherlands. Her speed was comparable to the best English tea clippers, decreased the sailing time to the Indies and suggested new possibilities to all Dutch shipbuilders. The Gebr. Blussé could have had their new clipper built in America but they chose to have the job done by the Gips firm which had already built some ten ships for family combines. Because of the insistence on building domestically the Blussés were able to

interest certain prominent political figures including Thorbecke who took one thirty-second part of the investment. Again liberal political ties may have contributed to business connections. Gips en Zonen themselves took two thirtyseconds. The return on that investment was far from satisfactory but they did not lose and given the novelty of the design it was not unexpected. 29) Despite their experiment with 'Kosmo', C. Gips en Zonen were still very much tied to the success or failure of Dordrecht shipping firms. Jan Schouten died in 1852 and his two sons took over the wharf. They tried to change design to be more up to date. But with the collapse in orders in the late 1850's the firm became bankrupt and was liquidated in 1860. The Gips firm did better. The crisis led to the construction of ever larger medium clippers, a compromise design where some speed was surrendered for hold space. And Dutch yards like that of Gips en Zonen could build ships of that type with significantly smaller crews. The clippers they built grew in size, the 'Kosmopoliet II' built in 1864 being 1077 tons. The 'Kosmopoliet III' finished in 1871 was 1548 tons. The firm was able to carry on because of the commitment of Mr. A. Blussé to wooden sailing ships. He claimed in a speech in 1880 that iron and steam had no future.

Despite Blussé's views the future of wooden ships was in doubt, buyers were more scarce and the future of C. Gips en Zonen was in doubt by the late 1860's. The firm had to build ships without a buyer, hoping that one would turn up before completion and even then taking on a sizeable owner's share when the vessel was sold. 30)

They did get orders for warships from Japan. It was more than an interesting sidelight for the firm since it kept the wharf on 'Willigenbosch' going in the mid-1860's. The first warship built was so large that it had to be towed to Brouwershaven where it was rigged and fitted out. These warships required more capital, more manpower, more workspace. The firm needed these orders however because it could not interest private buyers. The Japanese orders were only won by Gips en Zonen because they were made through the NHM. 31) That is not to say that the firm did not demonstrate a high degree of skill, of expertise and technical knowledge or management ability. They did over the course of the nineteenth century improve their skills, learn the new theory of shipbuilding and fulfill difficult contracts. But the contracts were won in the context of a protected market. The last big ship which they built was 'Kosmo III', that for the Gebr. Blussé.

It was obvious then by 1870 that a change had to be made. As ships grew in size they could not reach Dordrecht through the narrow and shallow waterways which connected the town with the sea. Prices of Dordrecht built ships by the 1860's were high compared to those of smaller towns in Holland and especially high compared to those of foreign builders. Restrictions on purchase of vessels from overseas were dropped completely in 1868 and the NHM changed its rate structure in the same year to the advantage of large ships. Faced with all the problems implied by those changes and with the deterioration of their capital position the firm of C. Gips en Zonen chose to convert to the construction and repair of steam-powered iron river vessels. In 45 years of building large ocean-going ships the firm on three wharves had produced more than 100 such cargo ships. The situation was once again like that of of the sixteenth century and all firms in Dordrecht had to seek refuge in work on small vessels. And it was a wise choice given the rapid expansion of shipping along the Rhine from the 1850's.

From 1852 the Gips firm had a slipway at Papendrecht for repair work. It was used by 30 to 40 ships per year and employed 100 men, more than on the building wharves except in the best of times. The decision of the town to abandon the 'kielpaal' in 1860 made the Papendrecht slipway the only place for the repair of large ships at or near Dordrecht. Contraction meant abandoning the 'Willigenbosch' wharf and conversion of the original wharf to other work. In 1910 there were still about 100 men working for C. Gips en Zonen. The firm was finally liquidated in 1916. 32) The experiments of Cornelis Gips and his successors had made possible the long survival of the business and combined with Jan Schouten and his sons, they participated in the last and the most impressive if not the most economically significant period of wooden shipbuilding at Dordrecht.

V. Competition and Government Protection.

It is simple to say that after the prosperity of the fourteenth century the shipbuilding industry of Dordrecht declined. But the decline lasted for four hundred and fifty years

The industry survived through great swings in the fortunes of the Dutch economy and through significant changes in the design of ships. The final disappearance of wooden shipbuilding and the abandoning of construction of sea-going vessels came only after the worldwide conversion to iron and to steam. It took dramatic and extensive changes in technology and geography to destroy Dordrecht wooden shipbuilding and then as late as 1871 a Dordrecht builder was constructing a sea-going clipper ship not of wood but still of the latest design and of dimensions to make it internationally competitive. The change to iron ships put Dordrecht at a disadvantage. The metal had to be imported and there were no indigenous coal supplies so any work with iron had to be relatively costly. The growth in the size of ships worked against Dordrecht as well. And with massive changes in the waterways and then the construction of the 'Nieuwe Waterweg' for Rotterdam, started in 1866, Dordrecht shippers lost any remnant of competitive strength. And a decline for native shipping concerns meant a fall off in orders for Dordrecht shipbuilding yards. Shipbuilders in the 'Noord', in the villages between Dordrecht and Rotterdam had all of the same problems. Yet they were able to continue effective competition. Importing iron, a firm of Krimpen aan de Lek was able to build river boats at a low enough cost to sell them in Germany. And the firm of Fop Smit of Kinderdijk built some of the best clipper ships produced in the Netherlands. They were of wood, of iron or composite build - it did not matter. Already in 1850 builders in the area had been experimenting with clipper design. And Smit's reputation was firmly established with the construction of the fast sailing iron vessel, 'California', in 1852. Clipper building in the 1850's and 1860's was centered in Dordrecht and in the 'Noord', and increasingly in the latter. Smit's firm continued to build clippers into the 1870's after such construction had to be abandoned at Dordrecht. More clippers were built in the 'Noord' than in any other district of the Netherlands.

The greatest problem for many builders in the 'Noord' was the size of their wharves which were too small for building the ever larger sailing vessels. 33) Lower wages relative to the cities were crucial to the competitive advantage of both Dordrecht and the 'Noord'. In the first half of the nineteenth century Dordrecht wharves could save buyers 40% or more over having their ships built at Rotterdam or Amsterdam. As the years passed the advantage of Dordrecht faded and the building of large vessels transferred to the even lower wage region of the 'Noord'. There building sea-going vessels, with a lower labour component than with river vessels and using imported iron, survived longer than at Dordrecht. For Dordrecht builders, faced with rising labour, land and material costs and the decline of their home market for big ships the only solution was to try and use their relatively more expensive resources, especially labour, in a more productive way. The change to river vessels meant effective exploitation of their more skilled labour as well as the effective exploitation of their geographic position as a major river port. It was indeed a return to the situation of the sixteenth century.

Shipbuilding at Dordrecht enjoyed a comfortable and lengthy if not always prosperous decline. In the process it kept alive associated trades such as sailmaking and anchor-making while supplying local shippers with services they needed. After all in 1846 there were still 45 ships that called Dordrecht home port. By 1871 the number had fallen to 20 and only 12 of those were of significant size. 34) The retrenchment of the shipbuilding industry was over a very long term. The guild and then the town government and later the national government by conscious acts of policy were able to keep the industry in tact. They were able to keep the shipbuilders competitive behind their wall of protection so that buyers were not heavily penalized and at the same time local shipbuilders might on occasion win contracts from outside sources, won in an open market without the advantages of protection. The protective measures of successive governments also made the industry competitive in the construction and repair of certain types of vessels. Dordrecht probably converted from being an international entrepot to being a distribution centre for south Holland and a river port as early as 1500. The specialization of the shipbuilding industry in inland vessels reflected that change. But the facts did not keep the government of Dordrecht from retaining pretensions to international status or from retaining the legal trappings of a great international port. Those legal trappings included the indulgence of a shipcarpenters' guild with many regulations and the protection of those shipcarpenters. That kept the industry from an early collapse. The shipbuilders while accepting and defending all those features of international pretension at the same

time wisely pursued the obvious economics and tended more and more to build vessels for the inland trades.

Dordrecht shipbuilders were never able to effectively exploit their excellent position. They had certain competitive advantages such as access to wood supplies, long established investment in facilities and in trained manpower, investment in harbours and contacts with suppliers and with buyers. In the Middle Ages they were close to northern Europe's busiest ports. Despite all that the industry fell behind competitors in the fifteenth century and was never able to regain that lost ground despite specialization in smaller vessels. So shipbuilding in the fifteenth and sixteenth centuries found itself tied up in the strict confines of guild rules which were designed in the first instance to protect, defend and maintain the industry. And the expansion of trade in the seventeenth century did not mean an end to the regulations of the guild but rather an increase. The industry in those years became irrevocably tied to the Dordrecht market for ships. That was the market they supplied and they were rarely, even in the nineteenth century, able to escape from dependence on the fortunes of local shipping interests. And Dordrecht merchants and businessmen rarely if ever ordered large vessels in the seventeenth century. It was not until the end of the eighteenth century that Dordrecht shipbuilders turned to the construction of large ships. The poor location relative to the fastest growing trades a fact which had been obvious since the fifteenth century, worked against the advantages enjoyed by the industry and the result was a slowing of growth and a limitation of experimentation through the seventeenth and eighteenth centuries.

In sum the rules of government from the Middle Ages to 1795 both on shipbuilding and on trade were designed for a medieval staple town. The result was just that type of trade and that type of shipbuilding. The rules served their purpose in keeping a few shipcarpenters busy with a few contracts. The industry was confined but comfortably confined. The rules kept the industry together so that at the end of the eighteenth century it was possible to succeed in the construction of sea-going ships. There were the facilities but more important there were the talented men to exploit the opportunities which appeared. The sharp departure from the past around 1800 was possible because the diversification and integration of shipbuilding and wood dealing activities and their concentration in the hands of a few men made it possible for that small group to assemble the necessary capital. The general economic deterioration of Dordrecht, the decline of the town had brought down wages and land values relative to the large towns of Holland. At the same time the Dordrecht guild had kept the training programme for shipbuilders so that skilled labour was available. The slow decline of the proceeding four centuries was turned into an advantage by the few remaining builders. And unquestionably they were handsomely rewarded from 1826 to about 1857 for their decision to break with tradition. The combination of long term developments in the economy and of both long and short term government policies made possible the sudden emergence of a small but successful, a limited but highly skilled and nationally and internationally prominent shipbuilding industry in what by the nineteenth century was a quiet economically insignificant provincial town.

NOTES.

- 1) This paper was prepared in part with the aid of a research grant from the Canada Council. I am also deeply indebted to the staff of the Gemeente Archief Dordrecht for their extensive assistance.
- 2) Nelly J. M. Kerling, *Commercial Relations of Holland and Zeeland with England from the late 13th Century to the Close of the Middle Ages*, Leiden, 1954, 4.
Henk Klomp maker, "Les Villes Néerlandaises au XVIIe Siècle, Institutions Economiques et Sociales," *Recueils de la Société Jean Bodin*, VII, 2(1955), 579.
J. F. Niermeyer, "Dordrecht als handelsstad in de tweede helft van de veertiende eeuw," *Bijdragen voor Vaderlandsche Geschiedenis en Oudheidkunde*, 8e reeks, III(1942), 3-5.
Bernard van Rijswijk, *Geschiedenis van het Dordtsche stapelrecht*, The Hague, 1900, 8-16.
- 3) Van Rijswijk, op. cit., 18, 21-40. 'Maasrecht' had in fact already been granted in 1338 by William IV but the 1355 extension was complete.

Matthys Balen Janszoon, *Beschryvinge der Stad Dordrecht*, Dordrecht, 1677, vol. I, 75-76.

J. L. van Dalen, "Het stapel- en Maasrecht van Dordrecht," *Tijdschrift voor Geschiedenis*, VI(1891), 2-6.

J. F. Niermeyer, "Een vijftiende-eeuwse handelsoorlog: Dordrecht contra de bovenlandse steden, 1442-1445," *Bijdragen en Mededelingen van het Historisch Genootschap*, LXVI(1948), 1-59.

- 4) Niermeyer, "Dordrecht als handelsstad . . .," 188-190, 222.
Van Rijswijk, op. cit., 41-43.
- 5) Niermeyer, "Dordrecht als handelsstad . . .," 21-36, 177-183.
W. S. Unger, "De economische en sociale structuur van Dordrecht in 1555," *De Economist* (1915), 969-971.
- 6) Niermeyer, "Dordrecht als handelsstad . . .," 1, 8e reeks, IV(1943), 91, 112.
Matthys Balen Janszoon, op. cit., vol. I, 511-512.
A. van Vollenhoven, *Ambachten en neringen in Dordrecht*, The Hague, 1923, 4-11, 15-16.
Gemeente Archief Dordrecht (hereafter G. A. D.), *Afdeling Gilden* (hereafter A. G.), 244(1367), 246(1367).
- 7) Van Vollenhoven, op. cit., 8-9, 20-21, 26-27, Appendix 3, no. 3.
G. A. D., A. G., 248, 254.
- 8) G. A. D., *Archief 1572-1795*, 3965(1594).
W. S. Unger, op. cit., 961, 981-984.
T. S. Jansma, "De betekenis van Dordrecht en Rotterdam omstreeks het midden der zestiende eeuw," *De Economist* (1943), 212-213, 233, 246.
Van Dalen, op. cit., 10-11.
Van Rijswijk, op. cit., 64-98.
Niermeyer, "Dordrecht als handelsstad . . .," III(1942), 2.
- 9) Van Vollenhoven, op. cit., 21-23, 51-53.
G. A. D., A. G., 250(1467), 252(1485), 253(1488), 266(1562), 268(before 1572), 261, paragraphs 4, 9, 10, 11(1548).
- 10) Van Vollenhoven, op. cit., 39-40.
G. A. D., A. G., 228, pp. 1-8, paragraphs 1-9, 13(1587), 229, pp. 27-29(1594), 33-36(1551), 232, fol. VI(1437), 258(1535), 261, paragraphs 1, 2, 12, 13(1548), 263(1554), 277(1595), 275(1589).
Richard W. Unger, "Regulations of Dutch Shipcarpenters in the Fifteenth and Sixteenth Centuries," *Tijdschrift voor Geschiedenis*, LXXXVI(1974).
- 11) G. A. D., A. G., 260(1536), 262(1549), 264(1555), 279(1597), 282(1603).
- 12) G. A. D., A. G., 9a(1583), 9b(1583), 247(1384), 255(1512-66), 256(1525), 265(1561), 269(1577), 272(1582), 273(1583), 285(1615), 286(1616).
- 13) Nina Ellinger Bang, ed., *Tabeller over Skibsfart og Varetransport gennem Øresund 1497-1660*, vol. I, *Tabeller over Skibsfarten*, Copenhagen, 1906. From 1558 to 1660 there were only 311 passages by ships calling Dordrecht home port through the Sound. By comparison all of Holland for just the ten years 1590 to 1599 had a total of 26,359. Enkhuizen for example in just one year (1590) showed a total of 394 passages.
- 14) J. L. van Dalen, *Geschiedenis van Dordrecht*, Dordrecht, 1931-1933, 396.
A. Staring, "Geschiedenis van Dordrecht," *Oudheidkundig Jaarboek*, V(1925), 74-76.
- 15) Johan Schreiner, *Die Niederländer und die Norwegische Holztafel im 17. Jahrhundert*, "Tijdschrift voor Geschiedenis", XLIX(1934), 303-306.
C. A. Schillemans, *De houtveilingen van Zaandam in de jaren 1655-1811*, The Hague, 1947, 84, 140-141.
S. C. van Kampen, *De Rotterdamse particuliere scheepsbouw in de tijd van de Republiek*, Assen, 1953, 125-137.
- 16) G. A. D., A. G., 229, pp. 10-20, paragraphs 1-12, 14, 22(1627), 229, pp. 20-21(1602), 21-25(1704), 165-168(1749), 136-141(1710), 142-144(1722), 203-205(1783), 293(1642), 295(1645), 296(1646), 297(1647), 201(1652), 305(1654), 306(1655), 312(1677), 315(1677), 319(1684), 333(1705), 337(1710), 338(1725), 339(1725), 341(1754), 344(1784).
- 17) G. A. D., A. G., 229, pp. 10-20, paragraph 19(1627), 317(1594-1678), 335(1706), 336(1707).

- A.J. Deurloo, "Bijltjes en Klouwers. Een bijdrage tot de geschiedenis der Amsterdamse scheepsbouw, in het bijzonder in de tweede helft der achttiende eeuw," Economisch- en Sociaal-Historisch Jaarboek, XXXIV(1971), 12 and passim. The same pattern emerged in Amsterdam in the eighteenth century and the move toward oligarchy was a common one in almost all guild regulated shipbuilding industries in Holland and Zeeland.
- 18) G.A.D., A.G., 229, pp. 100-114(1643), 154-157(1739), 230, pp. 119-121(1768), 237(1645-85), 241(1613), 242(1595-1799), 267(1571), 349(1583).
Van Kampen, op. cit., 32-41, 115-116.
- 19) G.A.D., A.G., 229, pp. 46-49(1657), 84-88(1702), 160-161(1741), 180-183(1757), 323(1685), 326(1697), 327, paragraphs 1-8(1698), 330, paragraphs 9, 10, 14-17, 28-38, 78-83, 218-224(1700), 331(1700), 332(1703).
- 20) G.A.D., A.G., 229, pp. 100-114(1643).
Van Kampen, op. cit., 48-49.
G.A.D., Archief van de Gemeente Dordrecht 1572-1795, 3507(1740).
G.A.D., Oude Rechterlijke Archieven, Archief van het Watergerecht, 1605, 1616, 1622.
Anon., "Tentoonstelling 'Schepen en werven te Dordrecht in de 19e eeuw,' 21 dec., 1963-16 febr., 1964," Maritiem Museum "Prins Hendrik", typescript introduction, 1-4.
E.W. Petrejus, Nederlandse Zeilschepen in de 19e eeuw, Bussum, 1974, 18.
- 21) Van Dalen, Geschiedenis van Dordrecht, 396.
G.A.D., A.G., 262(1549), 277(1595), 304(1654).
- 22) T. Lekkerkerker, Hout en Schepen. Uit de geschiedenis van de houtwerkingsbedrijven Gips, Leiden, 1941, abridged edition, 4-9.
J. Oderwald, Het Nederlandsche zeilschip van 1800 tot het einde, Amsterdam, 1939, 43.
- 23) G.A.D., A.G., 320(1684).
Staring, op. cit., 76-77.
Van Kampen, op. cit., 183-190, 98-103.
- 24) Anon., "Tentoonstelling 'Schepen en werven te Dordrecht...," 2-3.
A. Blussé van Oud-Alblas, De Geschiedenis van het clipperschip in Noord-Amerika, Engeland en Nederland, Second edition, Amsterdam, 1972, 124-125.
The Schouten firm has the advantage of having a number of important events in its history recorded in accurate and surviving pictures. See Petrejus, op. cit., 16, 17.
G.J. van Oostveen, De Economische Ontwikkeling van Dordrecht 1795-1945, Dordrecht, 1946, 85, 94, 102.
G.A.D., Dordracum Illustratum, 2472, 2473 for example.
- 25) Lekkerkerker, op. cit., 9-37.
- 26) Lekkerkerker, op. cit., 28-31.
Blussé van Oud-Alblas, op. cit., 120, 130-132.
Van Dalen, Geschiedenis van Dordrecht, 367-368.
G.A.D., Archief van de Rederij van Blussé van Oud-Alblas, for example 26, Notulenboek der vergadering gehouden door de Directeuren en de Raad der Rederij van de fregatschip 'Dortenaar', 1829-1831.
J.A. de Jonge, De Industrialisatie in Nederland tussen 1850 en 1914, Amsterdam, 1968, 130.
- 27) Lekkerkerker, op. cit., 55-56.
Van Oostveen, op. cit., 94-95.
- 28) G.A.D. Archief van de Rederij van Blussé van Oud-Alblas, 26, 27, 101, 118, 138, 158, 180. Unfortunately much of the archive was lost in the flood of 1953 so secondary sources from before that date must be relied on.
Van Dalen, Geschiedenis van Dordrecht, 371-373.
- 29) G.A.D., Archief van de Rederij van Blussé van Oud-Alblas, 216.
Lekkerkerker, op. cit., 41-49.
Blussé van Oud-Alblas, op. cit., 126-129, 133-142.
Anno Teenstra, De Clippers. Een nieuwe geschiedenis van de snelste Nederlandsche zeilschepen uit de tweede helft van de 19e Eeuw, Amsterdam, 1945, 53-85.
Oderwald, Het Nederlandsche zeilschip van 1800..., 71-72.

- Oderwald, Nederlandsche snelzeilers. De geschiedenis der snelle Nederlandsche clipperschepen, zoals zij gebouwd werden aan de grote stroomen in de negentiende eeuw, Amsterdam, 1940, 132-135.
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- 30) Blussé van Oud-Alblas, op. cit., 132, 147-149, 162-164.
Anon., "Tentoonstelling 'Schepen en werven te Dordrecht...," 6.
Teenstra, op. cit., 179-182, 235-266.
Van Oostveen, op. cit., 95-96, 101.
- 31) Lekkerkerker, op. cit., 56, 60-77.
- 32) Van Dalen, Geschiedenis van Dordrecht, 370-371, 395.
Lekkerkerker, op. cit., 77-79, 84.
Blussé van Oud-Alblas, op. cit., 152-155.
Van Oostveen, op. cit., 111-112.
Van Dalen, "Een gouden jubileum. D. Boest Gips, 1860-3, sept.-1910," Dordrechtse Courant, Mon., 29 Aug., 1910, Evening ed., 2.
De Jonge, op. cit., 147-148, 135-136.
- 33) De Jonge, op. cit., 137, 143, 148.
Blussé van Oud-Alblas, op. cit., 143, 155, 162.
Oderwald, Nederlandsche Snelzeilers . . . , 132-133.
Teenstra, op. cit., 30-31, 44, 85-87.
Anon., "Tentoonstelling 'Schepen en werven te Dordrecht . . .," 14.
- 34) Lekkerkerker, op. cit., 57-58.
Van Oostveen, op. cit., 51, 64-65. In 1811 there were still eight sailmakers in Dordrecht and in 1816 the number had dropped to four but that was a bad period for all industry.