

An early modern factory between state and market: labor and management at the Amsterdam naval shipyard (1660-1795)

Pepijn Brandon, Universiteit van Amsterdam
p.brandon1@uva.nl
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Abstract

Naval shipyards were among the largest production facilities of the pre-industrial world. The Venetian Arsenal and the British Royal Dockyards therefore play a prominent role in the historiography of early modern labor relations. However, labor relations at the Dutch naval shipyards remain understudied. The research of the Amsterdam naval storehouse and shipyard presented in this paper shows that in many respects, systems of administration, management methods, and shop-floor hierarchies were more ‘modern’ in the Dutch Republic than in its European counterparts, and more developed in these state facilities than in most other enterprises. The Dutch naval shipyards thus provide important keys to an understanding of the role of the state in the evolution of ‘capitalist’ systems of production. Furthermore, contrary to established views on Dutch naval management, substantial restructuring of labor relations continued during the ‘quiet years’ of the eighteenth century, changing our perspective on the evolution of manufacture after the seventeenth-century ‘Golden Age’.

In the early modern period, the building and equipment of a fully armed warship was one of the largest, most concentrated forms of investment in material goods that either the state or private entrepreneurs could undertake.¹ Navies depended on interaction with their economic hinterlands of an intensity that was comparable to that of few other institutions. Especially after the launching of major in-house shipbuilding programs with the tactical revolution of the 1650s and 1660s, the Admiralty shipyards became the focus of production and supply at an enormous scale. The Amsterdam naval shipyard was the second biggest production facility within the Dutch Republic, only surpassed by the VOC shipyard. The shipyards of the other Admiralty Boards were far smaller, but nevertheless remained among the biggest manufacturing enterprises of their respective regions.

The sheer size of naval shipyards all around Europe, the fact that they brought together hundreds or even thousands of workers at the same premises in an area when most production was still fragmented and small-scale, the complex nature of planning, costing, and coordination involved in the production of fully equipped men-of-war, the difficulties of technological innovation in a sector still dominated by craft labor, the strains on labor relations and friction between state demand and private suppliers – have all contributed to making these institutions into laboratories for historians interested in questions of modernization, the evolution of administrative cultures, and the development of capitalist relations.² And whereas in the past much of the literature on war and state formation

¹ As estimated by John Brewer, *The Sinews of power. War, money and the English state, 1688-1783* (Cambridge, MA 1988) 34.

² These themes are prominently addressed in recent studies on the Venetian arsenal, such as Robert C. Davis, *Shipbuilders of the Venetian Arsenal. Workers and Workplace in the Preindustrial City* (Baltimore 1991), Idem, ‘Venetian shipbuilders and the fountain of wine’, in: *Past & Present*, no. 156 (1997) 55-86, Luca Zan, ‘Accounting and management discourse in proto-industrial settings. The Venice Arsenal in the turn of the 16th century’, in: *Accounting and Business Research*, Vol. 32, no. 2 (2004) 147-175, and Stefano Zambon and Luca Zan, ‘Controlling expenditure, or the slow emergence of costing at the Venice Arsenal, 1586-1633’, in: *Accounting History Review*, volume 17 no 1 (2007) 105-128, and on the Royal Dockyards, Roger Morriss, ‘Industrial relations at Plymouth Dockyard, 1770-1820’, in: Michael Duffy et al. (eds), *The new maritime history*

concentrated heavily on finances, production, and supply for warfare on land, in recent years naval institutions have become the focus of an increasing number of studies on the evolution of states, bureaucracies, and practices of contracting.³

These larger debates, however, have as yet largely passed by Dutch historiography on the naval shipyards. Labor relations, supply systems, and management culture have been far more central in investigations of the VOC and smaller private yards than they have been for the Admiralty Boards.⁴ The debate on the functioning of naval shipyards is still heavily influenced by the image of a binary opposition between the efficient and market-oriented practices of the seventeenth century and the image of financially strung, nepotism-infested and lethargic institutions of the eighteenth century.⁵ Only very recently have historians started

of Devon. Volume I: From early times to the late eighteenth century (London 1992) 216-223, Roger Knight, 'From impressment to task work. Strikes and disruption in the Royal dockyards, 1688-1788', in: Kenneth Lunn and Ann Day (eds), *History of work & labour relations in the Royal dockyards* (London 1999) 1-20, and Peter Linebaugh, *The London hanged. Crime and civil society in the eighteenth century* (London 2006).

³ E.g. Jan Glete, *Navies and nations. Warships, navies and state building in Europe and America, 1500-1860*. Two Volumes (Stockholm 1993), Richard Harding, *Seapower and naval warfare 1650-1830* (London 1999), Jaap R. Bruijn, 'States and their navies from the late sixteenth to the end of the eighteenth centuries', in: Philippe Contamine (ed), *War and competition between states* (Oxford 2000) 69-98, N.A.M. Rodger, *The Command of the ocean. A naval history of Britain 1649-1815* (London 2004), Thomas Allison Kirk, *Genoa and the sea. Policy and power in an early modern maritime republic, 1559-1684* (Baltimore / London 2005), Jan Glete, *Swedish naval administration, 1521-1721* (Leiden 2010), and Roger Knight and Martin Wilcox, *Sustaining the Fleet, 1793-1815. War, the British Navy and the Contractor State* (Woodbridge 2010). Older literature addressing such questions in great detail includes: Johan E. Elias, *De vlootbouw in Nederland in de eerste helft der 17de eeuw 1596-1655* (Amsterdam 1933), R. Mémain, *Le Matériel de la Marine de Guerre sous Louis XIV. Rochefort, Arsenal modèle de Colbert (1666-1690)* (Paris 1936), and Bernard Pool, *Navy Board Contracts 1660-1832. Contract Administration under the Navy Board* (London 1966).

⁴ For the VOC, see the essays collected in F.M. Wieringa (ed), *De Verendigde Oostindische Compagnie in Amsterdam. Verslag van een werkgroep* (Amsterdam 1982), Werkgroep VOC-Oostenburg (ed), *Van VOC tot Werkspoor. Het Amsterdamse industrieterrein Oostenburg* (Utrecht 1986), Jerzy Gawronski, *De equipagie van de Hollandia en de Amsterdam. VOC-bedrijvigheid in 18de-eeuws Amsterdam* (Amsterdam 1996), and Jan Lucassen, 'A multinational and its labor force. The Dutch East India Company, 1595-1795', in: *International Labor and Working-Class History*, Vol. 66 (2004) 12-39. For private shipbuilders, see: Simon Christiaan van Kampen, *De Rotterdamse particuliere scheepsbouw in de tijd van de Republiek* (Assen 1953), Richard W. Unger, *Dutch shipbuilding before 1800. Ships and guilds* (Assen / Amsterdam 1978), and the sections on shipbuilding of Jan de Vries and Ad van der Woude, *The first modern economy. Success, failure, and perseverance of the Dutch economy, 1500-1815* (Cambridge 1997) 296-300.

⁵ The main work setting out this view remains J.R. Bruijn, *De admiraliteit van Amsterdam in rustige jaren 1713-1751. Regenten en financiën, schepen en zeevarenden* (Amsterdam / Haarlem 1970). Most studies on the other Admiralty Boards consisted of short articles, often highly episodic in nature. E.g. C.T.F. Thurkow, *De Westfriese Admiraliteit* (Enkhuizen 1945), Laura van 't Zand, 'Gehannes met een admiraalsschip. De bouw van de "Eendracht" (1652-1654)', in: *Tijdschrift voor Zeesgeschiedenis*, Vol. 17, no. 2 (1998) 135-144, Victor Enthoven, 'Mars en Mercurius bijeen. De smalle marges van het Nederlandse maritieme veiligheidsbeleid rond 1650', in: Leo Akveld et al. (eds), *In het kielzog. Maritiem-historische studies aangeboden aan Jaap R. Bruijn bij zijn vertrek als hoogleraar zeesgeschiedenis aan de Universiteit Leiden* (Amsterdam 2003) 40-60, Thea Roodhuyzen-van Breda Vriesman, 'Onfrisse Friese zaken. Een admiraliteit in opspraak', in: *ibid.*, 98-110. Relevant research into the workings of Zeeland Admiralty production has been done in the rich Zeeland Provincial Archive in recent years, contesting the idea that this smaller admiralty became lethargic and fully inefficient during the eighteenth century. Arjan Otte, 'Zeeuwse zeezaken. Een admiraliteit rond de Eerste Engelse Oorlog, 1651-1655', in: *Tijdschrift voor Zeesgeschiedenis*, Vol. 23, no. 2 (2004) 142-157, Wietse Veenstra, 'Geld is de zenuw van de oorlog. De financiën van de Zeeuwse Admiraliteit in de achttiende eeuw (1698-1795)', in: *Archief. Mededelingen van het Koninklijk Zeeuwsch Genootschap der Wetenschappen* (2008) 91-120.

to nuance this view, for example concluding that in the application of scientific drawing in the shipbuilding process, the eighteenth century was not as stagnant and wedded to age-old practices as was assumed heretofore.⁶ This paper will argue that the same holds true for labor relations and management practices. Taking a long view to the development of labor relations at particularly the Amsterdam naval shipyard, even the ‘quiet years’ of the 1730s and 1740s seem to present a picture of far-reaching restructuring, illustrating the continuing dynamism of Dutch manufacture.

Shipyards and their workforce

Together, the Admiralty Boards and the VOC laid a large claim on the labor-market. This was nowhere more true than in Amsterdam. Private shipyards in Amsterdam, the shipbuilding area of the Zaan, and Rotterdam usually employed around a hundred workers at most.⁷ The two shipyards at Kattenburg (belonging to the navy) and Oostenburg (belonging to the VOC) were of an altogether different category. During the eighteenth century, the Amsterdam chamber of the VOC employed between 1100 and 1300 workers at their shipyard and storehouse.⁸ For the Admiralty shipyard, the figure of ‘more than thousand’ is mostly maintained.⁹ As an average, this is probably correct. But at least at one point during the eighteenth century, at the start of the Fourth Anglo-Dutch War, the Amsterdam shipyard included on its payroll almost double that number, temporarily making it the largest single employer of the Dutch Republic.

⁶ For the old view of stagnation, see W. Voorbeijtel Cannenburg, ‘De Nederlandsche scheepsbouw in het midden der 18de eeuw’, *Jaarverslag Vereeniging Nederlandsch Historisch Scheepvaart Museum* (1924) 76-84, for the more nuanced new approach, see A.J. Hoving and A.A.Lemmers, *In tekening gebracht. De achttiende-eeuwse scheepsbouwers en hun ontwerpmethoden. Met daarin opgenomen De groote Nederlandsche scheepsbouw op een proportioneale reegel voor gestelt door Pieter van Zwijndregt Pauluszoon (1757)* (Amsterdam 2001).

⁷ 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*, Vol. 34 (1971) 4-71, 8, and Van Kampen, *Particuliere scheepsbouw*, 48.

⁸ J.G. van Dillen, *Van rijkdom en regenten. Handboek tot de economische en sociale geschiedenis van Nederland* (The Hague 1970) 400, F.S. Gaastra, ‘Arbeid op Oostenburg. Het personeel van de kamer Amsterdam van de Verenigde Oostindische Compagnie’, in: Werkgroep VOC-Oostenburg (red), *Van VOC tot Werkspoor*, 65-80, 79, Idem, *The Dutch East India Company. Expansion and decline* (Zutphen 2003) 163, and Gawronski, *Equipagie*, 113.

⁹ Deurloo, ‘Bijltjes en klouwers’, 7.

Table 1 Workers and supervisors at the naval shipyard and storehouse

	1733	1744	1781
A. Shipbuilders			
Shipwrights	266	166	648
Shipwrights' helpers			56
Boat makers	87	33	99
Wainscotters		10	27
Sawyers	29	12	14
Tool makers		6	8
Wood drillers	14	8	21
Wood workers	59	19	81
Mast makers	15	14	32
Chip gatherers	72	29	16
Wood cutters	26	1	9
Sub-total A	568	298	1011
B. Other craftsmen			
Carpenters	14	14	41
Rolling stock makers	9	6	8
Blacksmiths	27	18	40
Tin makers	4	5	7
Painters	17	9	15
Bricklayers	11	11	14
Tackle makers	9	10	11
Plumbers	3	3	4
Oar makers	5	4	5
Coopers	16	13	16
Stone turners	4	5	7
Tar cooks			2
Compass makers	2	2	1
Sword makers and their helpers	8	5	5
Saddle makers			1
Sail makers	23	21	42
Sail makers' helpers	6	5	2

Clog makers		1	1
Sub-total B	158	132	222
C. Other workers, mainly unskilled			
Carriers	283	146	518
Beer carriers			23
Unspecified workers	5	28	7
Pump servants	6	22	14
Rowers	15	15	14
Skippers, boatsmen and sailors on yachts and transport ships	43	61	38
Sub-total C	352	272	614
D. Supervisors and guards			
Supervisors (masters, their servants, commanders, vice-commanders)	62	66	73
Guards	56	52	42
Porters	4	5	6
Other controlling personnel	0	1	2
Sub-total D	122	124	123
Total (A + B + C + D)			
	1200	826	1970

Sources: NA, Archief J.C. van der Hoop, no. 153. 'Secrete missiven', 30 June 1751, and NA, Archief Admiraliteitscolleges XXXIX, J.C. van der Hoop (1524-1825), no. 104. 'Tractementen & emolumenten van alle de hooge & laagen bediening van het Edel Mogend Collegie ter Admiraliteit resideerende binnen Amsterdam. Mitsgaders de dagloonen der werklieden op s lands magazyne, timmerwerff, lynbaan & geschut werff'.

A detailed picture of the total number of workers and the internal division of the workforce can be obtained from two documents, both from the eighteenth century. The first is a report for the States General from 1751, giving extensive information on the employment at the different departments of the wharf and storehouse for the years 1733 and 1744. The second is a complete account of all the salaries and wages paid to officials and workers of the Amsterdam Admiralty Board in 1781. The extensive information on the number and different type of workers produced by these documents is summarized in table 1.

These figures show the great flexibility of the number of workers employed. In 1733, the size of the workforce at the Admiralty shipyard must have been approximately equal to that of the VOC. Between 1733 and 1744 the Admiralty Board laid off almost a third of its workforce, reflecting a sharp decline in output of new built ships during the 1740s. Meanwhile the VOC-wharf expanded due to a boom in shipping. In the run-up to and during the Fourth Anglo-Dutch War, when the Amsterdam Admiralty Board engaged in a major program of shipbuilding at the same time as having to manage the equipment of the existing war fleet, total employment once again rose steeply. The total size of the workforce at the navy shipyard and storehouse now temporarily greatly surpassed the number of workers employed at the VOC shipyard. The speed of expansion and contraction before and after war can also be gauged from the expenses on labor costs. One of the standard posts on the receiver general's yearly accounts to the Generalty Audit Office was reserved for 'wages of shipwrights and carriers'. These included the wages of all non-managerial personnel at the naval shipyards (shipyard managers were included under the heading of salaries, '*tractementen*'). Figure 1 shows the development of wage costs on the Amsterdam accounts between 1775 and 1788. From less than *f* 400,000 a year, they rose to just short of a million guilders in 1781 when employment at the shipyard reached its eighteenth century highpoint. This figure again affirms the large capacity of the Admiralty shipyard. In his summary of the VOC ledgers for the eighteenth century, De Korte gave the average annual wage costs as under half a million guilders before 1730, than rising to *f* 530,000-*f* 550,000 until 1780, falling back to *f* 500,000 a year in the 1780s.¹⁰ Gawronski has suggested on the basis of a different account that the wage costs during the boom years in shipbuilding of the 1740s might have been close to a million guilders for the VOC as well, but as he points out, these figures probably include all sorts of non-wage expenditures.¹¹ However, the workforce of the naval shipyard was subject to much larger fluctuations than that of the VOC shipyards. During the 1780s, as soon as the war ended wage costs were brought back to their pre-war level.

¹⁰ J.P. De Korte, *De jaarlijkse financiële verantwoording in de Verenigde Oostindische Compagnie* (Leiden 1984) appendix 12A and 12B.

¹¹ Gawronski, *Equipagie*, 46-47.

Figure 1 Expenditure on workers' wages by the Amsterdam Admiralty, 1775-1788 (guilders)



Source: Figures for 1775-1779 and 1781-1788: NA, Archief Generaliteitsrekenkamer, no. 587-599. Figure for 1780: NA, Archief J.C. van der Hoop, no. 166. 'Missives der Collegien ter Admiraliteit met de lysten van de scheepen welke by haar zyn aangebouwt en gekogt, als meede van het geene zy in gevolge de petitien genooten hebbe, en van het geene hun nog is competerende, 31 Augustus 1784'.

In comparison to the size of the workforce of the other Admiralty Boards, the Amsterdam naval shipyard was a Moloch. The smallest numbers were employed by the Admiralty Boards of the Northern Quarter and Zeeland. The Admiralty Board of the Northern Quarter did not possess its own wharf, and even in 1680 when its role in equipping was still bigger than during the eighteenth century only employed two shipwrights, one cannon founder and twenty-four carriers in permanent service.¹² A careful estimate of the workforce of the Zeeland Admiralty Board shows that even in the peak years 1654 and 1665-1666 the different naval establishments did not employ much more than some tens of workers at their shipyards.¹³ This must have dropped to an absolute minimum in the course of the eighteenth century, when the Zeeland Admiralty Board often carried out hardly any shipbuilding and maintenance work. From January 1781 to July 1784, in the midst of the Fourth Anglo-Dutch War, the master of equipment of the Vlissingen shipyard noted a total of about f 220,000 for

¹² National Archive, The Hague (From here: NA), Archief Van der Hoop, no. 163. 'Staet van de Tractementen, Emolumenten, Necessiteyten, Vacatien, ende andere onkosten ten laste van het Collegie ter Admiraliteyt in West-Vrieslandt ende het Noorder-Quartier, 1680'.

¹³ Benoit Strubbe, 'Oorlogsscheepsbouw en werven in Zeeland tijdens de Engels-Staatse oorlogen (1650-1674)', unpublished thesis, Ghent 2007, 121.

‘wages of shipwrights, blacksmiths, carriers, and other workers’, or an average of just over *f* 60,000 per year.¹⁴ This made even the biggest Zeeland shipyard considerably smaller than the VOC shipyard in Middelburg, which employed about 600 workers in 1790.¹⁵

The Admiralty Boards of Friesland and Rotterdam employed more workers, the latter being the largest of the two. For Rotterdam, two handwritten transcriptions from the late eighteenth century survive containing both ordinary and extra-ordinary expenditure of the Rotterdam receiver general over a number of selected years. These include the early years 1642, 1668, and 1675 for which no accounts are present in the archive of the Generality Audit Office. The documents also split the wage costs for the facilities at Rotterdam and Hellevoetsluys. Table 2 summarizes the information on total wage costs they provide. For 1751, a report of the Admiralty Board of Rotterdam on the state of the naval shipyards provides more detailed information on the employment at the shipyards and storehouses, giving a combined total of just over 225 workers, of whom 25 were supervisors, at the two locations.¹⁶ At the start of the Fourth Anglo-Dutch War wage costs at the Rotterdam shipyards and storehouses almost quadrupled. This expansion was proportionally bigger than that of the Amsterdam shipyard during the same year. Making a rough estimate based on these available figures, it is safe to assume that all five Admiralty Boards taken together employed no more than between 1200-1500 workers during the quiet 1740s, but expanded their workforce to somewhere between 3000-3500 at the start of the Fourth Anglo-Dutch War, reducing it again quickly once the war was over.

¹⁴ Rijksarchief Zeeland (from here: RAZ), Archief Rekenkamer C, no. 36930. ‘Account of Maarten Haringman, Master of Equipment in Vlissingen’, 1781-July 1784.

¹⁵ Gaastra, *Dutch East India Company*, 145.

¹⁶ NA, Archief Van der Hoop, no. 153. ‘Secrete Missiven’, 30 juni 1751, 11-21.

Table 2 Sums paid on wage costs by the receiver general of the Rotterdam Admiralty Board, selected years (in guilders)

	1642	1668	1675	1683	1712	1721	1750	1776	1782
Wage costs in Rotterdam	24,615	20,257	3,119	11,722	8,079	40,332	51,405	65,731	287,359
Wage costs in Hellevoetsluys	0	24,813	3,304	40,748	2,408	36,138	51,805	55,230	123,380
Wage costs at the rope-factory	0	0	0	0	7,187	1,460	2,246	3,776	7,662
General wage costs (location unknown)	26,535	45,523	18,070	2,536	17,473	3,000	2,750	1,859	26,740
Total	51,150	90,593	24,493	55,006	35,147	80,930	108,206	126,596	445,141

Source: NA, *Archief Admiraltieitscolleges XXXVII, Van der Heim, nos 365-366. 'Ordinaris en extra-ordinaris rekeningen van de Ontvanger Generaal van de Admiraliteit op de Maze, 1642-1782'.*

Admiralty Boards and the labor market

How did the Admiralty Boards recruit these large numbers of often specialized workers? De Vries and Van der Woude have stressed the 'modern' nature of the Dutch labor market. As key characteristics of this developed market they pointed at the strong internal segmentation, high wage levels, and the combination of large scale unemployment and temporary, season-bound labor shortages, which were met by employing cheap migrant labor.¹⁷ Lucassen emphasized the fact that the Dutch Republic was perhaps the only country before the industrial revolution with a fully 'free' labor market, meaning that economic force had replaced physical force, bondage, and penal law as the main instrument in recruiting labor power. Personal arrangements between masters and servants or employers and their workforce were substituted by impersonal relations.¹⁸ Furthermore, recent literature showed

¹⁷ Jan de Vries and Ad van der Woude, *First modern economy*, 654.

¹⁸ Jan Lucassen, 'Labour and early modern economic development', in: Karel Davids and Jan Lucassen (eds), *A miracle mirrored. The Dutch Republic in European perspective* (Cambridge 1995) 367-409, 394-396. As Lucassen himself pointed out, this freedom did not extend to the Dutch possessions overseas. Furthermore,

that the proliferation of guilds during the sixteenth and seventeenth centuries did not contradict or impede this development.¹⁹ As one of the largest manufacturing employers of the Dutch Republic, the Amsterdam naval shipyard forms an important case-study for those claims.

The number of different jobs among the shipyard's workforce meant that it strongly reflected the existing social segmentation of the labor market. Descriptions of labor relations at the shipyards often look only at the position of shipwrights. With a daily wage of thirty *stuivers* in summer and twenty in winter, they formed the best paid section of the Admiralty workforce. However, the majority of the workforce had wages far below this level. Table 3 gives an impression of the internal wage differentiation among workers at the wharf. As was true for most sections of the urban working classes, nominal wages remained remarkably stable from the middle of the seventeenth century until the nineteenth century so that this table can be safely taken as an indication for the entire period under investigation.²⁰ But because workers were paid per day, equal wage rates could conceal great fluctuations in income. The table gives two different calculations. The first is the income based on the maximum number of working days per year, based on a working week of six days and subtracting holidays. The second is the income calculated on the number of working days mentioned in a request of shipwrights to William IV from December 1749. Apart from Sundays and holidays, workers complained of the many days involuntarily lost because of rain or high water (45), sickness, or the lack of work (36).²¹ The actual yearly income is likely to have been somewhere between these two extremes. Together, these figures give a good impression of the high level of internal segmentation among shipyard personnel, even strengthened by the existence of a large number of intermediate scales.

sailors and soldiers frequently suffered semi-forced ways of recruitment through the practices of so-called 'zielverkopers' (soul-sellers), who used debt as an effective means of impressment.

¹⁹ Unger, *Dutch shipbuilding*, 22, Bert de Munck, Piet Lourens and Jan Lucassen, 'The establishment and distribution of craft guilds in the Low Countries, 1000-1800', in: Maarten Prak, Catharina Lis, Jan Lucassen, and Hugo Soly (eds), *Craft guilds in the early modern Low Countries. Work, power and representation* (Aldershot 2006) 32-73, S.R. Epstein and Maarten Prak, 'Introduction', in: S.R. Epstein and Maarten Prak (eds), *Guilds, innovation, and the European economy, 1400-1800* (Cambridge 2008) 1-24, 21, and Catharina Lis and Hugo Soly, 'Subcontracting in guild-based export trades, thirteenth-eighteenth centuries', in: *ibid*, 81-113.

²⁰ Deurloo, 'Bijltjes en klouwers', 28-29, and De Vries and Van der Woude, *First modern economy*, 646-647.

²¹ NA, Archief van de Stadhouderlijke Secretarie, 1600-1795, no. 467. 'Request aan Willem IV van 6 december 1749', also referred to by Deurloo, 'Bijltjes en klouwers', 29.

Table 3 Wages of different categories of laborers at the naval shipyard (1781)

	Wage (summer/winter)	Income based on 306 (max) working days	Income based on 226 working days
Shipwrights and other skilled craftsmen	30 / 20 st	f421	f311
Painters, bricklayers, plumbers and other semi-skilled craftsmen	24 / 18 st	f344	f254
Carriers and other unskilled workers	16 / 14 st	f237	f175
Apprentices, beer carriers, etc.	8 / 6 st	f115	f85

Source: NA, *Archief Admiraliteitscolleges XXXIX, J.C. van der Hoop (1524-1825), no. 104.* 'Daglonen'.

For those who managed to attain permanent contracts, employment at the Admiralty yard often was a much better deal than the day rate suggests. This is due to the many hidden forms of payment that existed. A payroll of the Rotterdam Admiralty Board from March 1751 shows that many guards, though formally on daily pay, actually received this wage thirty-one days a month, plus ten *stuivers* for every night watch. In this way, all twenty-three guards received a monthly wage of over thirty guilders, more than many of the skilled craftsmen employed by the Admiralty Board.²² Becoming a guard for the Admiralty Board thus became a career opportunity for lower-paid workers. Cornelis van Oeveren, who was a not unsuccessful cart maker in Rotterdam before 1747, used the clout he had built around himself during the Orangist revolt of that year to attain a position as guard, and according to his own testimony fared well from it.²³ Similar advantages were common in Amsterdam as well, although during the 1740s the Admiralty Board tried to limit the number of people on seven days' pay to a small group of people who either actually remained in function the whole week, or were 'of special knowledge and capacities'.²⁴

However, the position of these relatively well paid workers tells only half the story. This is shown by the detailed wage administration of the rope factory of the Amsterdam Admiralty

²² NA, Archief Van der Hoop, no. 153. 'Lyste van de losse en vaste bediendens, en wat ieder wint', 3-7.

²³ *Levensbeschryving van Cornelis van Oeveren, eertyds wagenmaker, en sedert hellebaardier by het Ed. Mog. Collegie ter Admiraliteit op de Maze, te Rotterdam; (...). Uitgegeven naar zyn eigen handschrift (Rotterdam s.d.. [1787])*

²⁴ NA, Archief Van der Hoop, no. 153. 'Secrete Missiven', 30 June 1751, 74.

Board that survived. On the upper end of the scale, the wage lists include Steven Duijm, who was already employed in a supervising position at the time when the first available list was made up in 1719, and retained this function at least until 1752. Duijm received a wage of twenty *stuyvers* a day, later raised to twenty-five *stuyvers*, for 366 full days per year. This brought his yearly income at maximum at the ample sum of *f* 481,25.²⁵ However, wages of most workers stood at fourteen to sixteen *stuyvers*, and there also were many on the list (probably children or apprentices) not paid more than five or six *stuyvers*. Furthermore almost all workers received pay only for the days worked, and most were not hired during the entire period that they were available for work. The 1730 wage administration, for example, shows how the ordinary worker Jan Poortman was employed during each of the thirteen pay periods, but not for the full length of each period. In total, he worked just over 250 days for sixteen *stuyvers* in summer and fourteen *stuyvers* in winter, bringing his yearly income at *f* 206. Of the seventy-nine workers on the 1730 wage list, only thirty-seven were in such ‘permanent’ employment, defined here as having some work during at least ten out of thirteen pay periods. Their average yearly income from the rope factory amounted to *f* 178 guilders.²⁶ It is impossible to tell whether these workers could add to their incomes by other means, but the figures do attest to the great dependence of the Admiralty Board on low paid, temporary or even day laborers on very insecure incomes. Alternately, the fact of this continued dependence also suggests that on the developed labor market of the Republic, these low wage workers could be found with relative ease so there was no need for the Admiralty Boards to offer more stable working conditions. This situation must also have prevailed for carriers, at most times forming the largest single group of workers at the shipyard and storehouse. As a study of representations of labor in the Dutch seventeenth century notes, carriers were the ‘omnipresent stage extras’ of the Dutch Golden Age.²⁷ Several types of carrying labor, such as that of rye and peat, were organized into rather influential guilds, but carrying on the naval shipyard was done by non-guild workers. With large numbers of urban poor and recent immigrants from low wage regions, this labor was in chronic oversupply.

The existence of bonuses and internal career opportunities for a select group within the workforce must have made the Admiralty Board a relatively attractive employer. Furthermore, in binding its workforce economically it could make tactical use of the fact that

²⁵ NA, Archief van de lijnbaan in Amsterdam 1712-1892, no. 8-10. ‘Betalingsboek spinders en draijers’, 1719-1727, 1727-1734, and 1735-1753.

²⁶ NA, Archief van de lijnbaan in Amsterdam 1712-1892, no. 9. ‘Betalingsboek spinders en draijers’, 1727-1734.

²⁷ Annette de Vries, *Ingelijst werk. De verbeelding van arbeid en beroep in de vroegmoderne Nederlanden* (Zwolle 2004) 196.

it operated not one, but two recruitment systems for cheap labor: one on land, the other at sea. This became of particular importance after the 1720s when the number of ships sailing for the marine declined. Letting go of all experienced sailors would have been a dangerous step, given the sharp competition the naval authorities faced from the merchant fleet and the VOC in the area of recruitment of sailors. Thus, the Admiralty Board decided to establish special work gangs of carriers (so-called *vemen*) consisting solely of non-commissioned officers (NCOs). The condition for admission was that these NCOs would not refuse to sign up for the navy when the occasion arose, and would not take employment with any other company without prior knowledge of the Admiralty Board.²⁸ In 1733 the same arrangement was extended to sailors who had served the marine during at least two voyages, were between eighteen and fifty years of age, and could show a declaration of good behavior from their officers. Most non-skilled jobs at the shipyard were opened for these former seafarers.²⁹ In 1744, with greater need to preserve able sailors given the Dutch implication in the War of the Austrian Succession but fewer available positions on the wharf, the directors limited access to the gangs to ‘the very best men’. They asked officers to draw up lists of their sailors in order to decide who was to be allowed jobs on shore.³⁰

In this way, the Amsterdam Admiralty administrators could make use of internal shifts in supply and demand of labor power, using economic means to guarantee a reservoir of experienced seafarers. What they could not do, however, was using force to impress these same workers when they felt that the need arose. The unattractiveness of life on board of warships – with its high mortality rates, horrid quality of food and harsh discipline – made many NCOs decide to ignore the conditions of their employment at the wharf. In 1762 the Admiralty Board decided to start diminishing the number of officers on the yards, noting

‘the difficulties that have risen in making the NCOs serve on the new ships, because they often decline to do so; and though they are dismissed from the nation’s wharf, they then have often already drawn money [i.e. their wages] from this wharf for years, without in the end serving the beneficial purpose of this Board.’

Signifying the relative ease with which workers moved in and out of employment, the Admiralty Board also had to order that NCOs who had been previously dismissed from the

²⁸ NA, Archief Van der Hoop, no. 153. ‘Secrete missiven’, 30 June 1751’, 25.

²⁹ Ibid, 36.

³⁰ Ibid, 68.

shipyard for refusing service could not be re-admitted into service at the wharf at a later stage.³¹

More difficult than the securing of low- or unskilled labor was the recruitment of skilled shipwrights. According to the figures of Hart, which are based on the records for marriages and therefore incomplete, there were around a thousand skilled shipwrights in Amsterdam during the second half of the seventeenth century.³² Around the middle of the eighteenth century the shipwrights' guild had some 1500 members, including both masters and journeymen.³³ While traditionally masters and supervisors had played a big role as intermediaries in the recruitment of personnel, the appointment of set places where workers could solicit for employment signals a transition to more impersonal practices. Wagenaar in his eighteenth-century description of Amsterdam described how this form of recruitment worked:

‘Shipwrights who are looking for employment must gather in the morning half an hour before the sounding of the bell of the Admiralty wharf at the Kadyk near the Kattenburg Bridge, or at the start of the Bicker-street, and in the afternoon, between twelve and one, at the New Bridge. They are not allowed to accept employment along the way, or at any other place.’³⁴

However, it is well possible that this method of recruitment reflected the rather unfavorable conditions of the mid-eighteenth century, when many shipwrights at the Admiralty wharf had lost employment due to recent reduction of the workforce. The large demand of the two big shipyards and the limited number of skilled workers meant that at other times the Admiralty Board and the VOC had to engage in serious competition with the private shipyards. These yards paid higher day wages, and often added better possibilities to achieve bonuses. Support from the town government in part helped to shield the big wharfs from this competition, often at the cost of their workers. Private shipyards were prohibited to hire unemployed shipwrights from the VOC or Admiralty yards as long as shipwrights who used to work on private yards were available. If this was not the case, former VOC or Admiralty workers were allowed to

³¹ Library University of Amsterdam, Special Collections (From here: UB-BC), *Extracten*. ‘Extract from the minutes of the Amsterdam Admiralty Board, 9 February 1762’.

³² S. Hart, ‘Geschrift en getal. Onderzoek naar de samenstelling van de bevolking van Amsterdam in de 17^e en 18^e eeuw, op grond van gegevens over migratie, huwelijk, beroep en alfabetisme’, in: Idem, *Geschrift en getal. Een keuze uit de demografisch-, economisch- en sociaal-historische studiën op grond van Amsterdamse en Zaanse archivalia, 1600-1800* (Dordrecht 1976) 115-181, 129.

³³ Wagenaar, *Amsterdam*. Volume II, 461, and Sandra Bos, “Uyt liefde tot malcander”. *Onderlinge hulpverlening binnen de Noord-Nederlandse gilden in internationaal perspectief (1570-1820)* (Amsterdam 1998) 90.

³⁴ *Ibid*, 460.

work for selected masters only, and on the condition that they could be rehired by the two ‘principle wharfs’ as soon as this would be considered necessary.³⁵ Furthermore, the Admiralty Board and VOC were exempted from the rule that new ships could only be built by workers that were members of the guilds. This exemption was strongly contested by guild members since wages for non-guild workers were lower than for guild workers, but without success.³⁶ In 1781 the Amsterdam Admiralty Board employed 281 non-guild shipwrights, alongside the 367 members of the guild.³⁷

Finding enough skilled workers to work at the yards at times of war could prove very hard indeed. Both the Amsterdam and Rotterdam Admiralty Boards blamed their slowness in building new warships in the run up to the Fourth Anglo-Dutch War on a lack of skilled personnel. According to the Amsterdam Admiralty Board, building could have been taken to hand at full speed

‘if the lack of shipwrights in the years 1777, 1778, 1779, and 1780, caused by the many merchant ships that were built and repaired, would not have hindered us; a problem which, despite of all attempts of and orders to our master shipwright to recruit more laborers, we could not remedy.’

Only when commercial shipping declined because of the arrival of war, leading to the layoff of many workers at the private shipyards, the Amsterdam Admiralty Board managed to find enough workers to start its building program at full speed.³⁸ This suggests that the Admiralty Board did not have many means to manipulate the labor market before a change of conditions led to an increase in availability of skilled labor.

Problems were even greater for the Rotterdam Admiralty Board, which had to resort to a series of more drastic measures to attract shipwrights. In the quiet years since the Seven Years’ War, the Admiralty councilors alleged, the position of the Admiralty Board on the labor market had sharply deteriorated. There were rumors suggesting that many unemployed shipwrights had emigrated to the East Indies or taken employment at sea. Others had left the Admiralty Board to work for private shipyards where they could earn bonuses over and above their regular wage. The result was that when the Admiralty Board needed to expand its workforce during the second half of the 1770s, it had to offer passes for workers from outside

³⁵ *Idem*.

³⁶ NA, Archief Stadhoudelijke Secretarie, no. 467. ‘Request aan Willem IV van 6 december 1749.’

³⁷ NA, Archief Admiralty Colleges XXXIX, J.C. van der Hoop, no. 104. ‘Dagloonen’.

³⁸ NA, Archief Van der Hoop, no. 151. ‘Bylaagen’, 63-64.

the Republic, employ unqualified carpenters, wagon makers, and mill makers as shipwrights, and force those who were already employed by the Admiralty Board to work on Sundays and at night hours. Significantly, the Rotterdam Board offered premiums to master shipwrights, supervisors, and under-supervisors if they managed to recruit workers, showing that at the smaller Admiralty shipyards these groups probably retained a strong role as intermediary links to the labor market. When none of this proved sufficient to solve the labor shortage, the Admiralty Board requested from the States of Holland to order the bosses at the private wharfs to yield one-fourth or one-fifth of their workers to the Admiralty shipyard, a measure that also had been in place during the war year 1747-1748. The owners of the private yards offered a compromise, promising to send one in six of their workers.³⁹

An interesting question is why such sharp shifts in the balance of supply and demand on the labor market did not lead to any fluctuations in the nominal wage rate. One of the possible answers lies in the exceptionally good conditions of shipwrights as compared to other workers, as Lucassen pointed out for the roughly 350 skilled workers at the VOC yard. Not only was their wage rate higher than that of most skilled workers, they also enjoyed favorable secondary conditions such as severance pay and old age provisions.⁴⁰ In 1781 a total of seventy-two former workers at the Admiralty wharf and storehouse received such 'pensions'. Nevertheless, with unchanging nominal wages inflation could have a serious impact on living conditions, raising the question why a relatively powerful group of workers would not try to compensate for this by demanding higher wages. Another factor should therefore be taken into account: the dampening of wage pressures by the large potential differences between wage rate and actual income due to fluctuations in the occupation rate.⁴¹ When high inflation coincided with an expansion of the number of days worked, a decline in real wages did not have to signify an actual decline in income. Especially for workers at the naval shipyards, it is likely that price increases and increasing labor intensity often coincided. While prices remained relatively stable during peace years well into the eighteenth century, periods of sharp inflation until that time always coincided with wars in which the Dutch Republic was involved. During these periods the Admiralty shipyards worked at full speed. Only from the 1740s onwards this pattern was broken. The combination of the policy of neutrality of the Dutch Republic and the prolonged financial distress of the Amsterdam Admiralty Board

³⁹ Ibid, 34-36, and 56-57.

⁴⁰ Lucassen, 'Multinational', 29.

⁴¹ The significance of this factor was already pointed out by Leo Noordegraaf and Jan Luiten van Zanden, 'Early modern economic growth and the standard of living. Did labour benefit from Holland's Golden Age?', in: Davids and Lucassen (eds), *A miracle mirrored*, 410-437, 425.

resulted in a series of sharp attacks on the secondary benefits of shipyard workers and decreasing employment, coinciding with steep inflation. It seems no coincidence that by the end of this decade shipwrights systematically started putting forward wage demands for the first time. However, the long and severe depression in the manufacturing sector during the second half of the eighteenth century did not prove conducive for winning their demands.

Overall, the recruitment and employment of workers by the Amsterdam Admiralty Board accords well with the ‘modern’ characteristics of the Dutch labor market as listed by De Vries and Van der Woude. Both because of its size and because of its backing by the state the Admiralty Boards could and did try to manipulate the supply and demand of labor, often at the cost of the freedom of movement of their workers. But despite the apparent rigidity of the wage system, it did so primarily by economic means. Large differences in internal wage scales, the use or restriction of bonuses, promising long-term employment or effectively using the threat of unemployment, and the existence of possibilities for internal replacement of labor helped to stabilize the Admiralty workforce, despite major fluctuations in the level of production at the wharf. Where the state did intervene, it was by granting the Admiralty Board and VOC to circumvent guild regulations for employment. Both institutions could thus make use of the dampening effect on labor unrest of the guild’s system for mutual aid, while hardly suffering restrictions on their own use of non-guild labor.

Important aspects on the use of labor at the Amsterdam naval shipyard still remain to be investigated, such as gender divisions, child labor, and the role of foreign recruitment. The Amsterdam Admiralty Board must have employed many women, though probably mostly not as shipwrights. A list of persons receiving money as former workers from 1680 contains fifteen women, excluding the widows of high officers, as against thirty-seven men.⁴² As to migrant labor, its extensive use at the VOC shipyard makes it most likely that it formed an important source for workers for the Admiralty Board as well.⁴³ During the sharp labor shortage in the run up to the Fourth Anglo-Dutch War, Admiralty administrators indeed actively sought to recruit foreign workers, using agents abroad to solicit for shipwrights. Further research on such issues is likely to strengthen the image of the Amsterdam shipyard as

⁴² NA, Archief Van der Hoop, no. 161. ‘Notitie van Tractementen en Pensioenen, in den jare 1650 gelopen hebbende tot lasten van het Collegie ter Admiraliteyt, residerende binnen Amsterdam, en hoe die successivelijck vermindert, vernieticht, verhooght of nieuwelijcks inghevoert souden moghen zyn tot het eynde van het jaer 1680’, 14-15.

⁴³ Research on the far more complete lists of workers of the VOC shows that a high percentage of the craftsmen who lived and worked in the quarter of Kattenburg and Oostenburg were in fact of foreign origin. Edward Opper, *Dutch East India Company artisans in the early eighteenth century*, unpublished dissertation, Indiana University 1975, 114ff.

operating a highly flexible and differentiated system of recruitment, reflecting the highly developed nature of the labor market in the Dutch Republic.

Combination, coordination and control

The prominent role of naval institutions in the development of labor relations was not restricted to their position on the labor market. In his study of shipbuilders at the Venetian Arsenal, Robert C. Davis has rightly stressed their importance for the history of the organization of work itself:

‘Seemingly defined by bureaucratic and military structures and operating largely independently of the workings of profit and the marketplace, such large, state-run shipyards have generally not appeared especially central to the key social and economic determinates of the industrializing process. Nevertheless, the massive, concentrated workforces of large manufactories like the Arsenal presented for the first time kinds of management and labor problems that would be much more typical of the industrial factory than of the putting-out system: the disciplines of wages and time, the need for coordinated work gangs, and the formation of specialized and uniform “company towns” on the fringes of the workplace.’⁴⁴

In this sense the Amsterdam naval shipyard was as advanced as the famous Arsenal. Between 1650 and 1795 important changes took place in the organization of shipbuilding, the relations between master craftsmen and ordinary workers, and the enforcement of labor discipline. However, there were large differences with the operation of modern factories as well. The most significant of those probably was the subordinated role of machinery, technology, and technological change. Van Dillen described the structure of early-modern shipbuilding as that of ‘manufacture or the non-mechanized enterprise’, and this feature of work at the naval shipyards remained basically unchallenged throughout the period under examination.⁴⁵ Attempts to gain in speed and cost-efficiency thus seem to have remained focused on the triad of combination, coordination, and control of labor, rather than the systematic introduction of labor-saving devices.⁴⁶

⁴⁴ Davis, *Shipbuilders*, 7.

⁴⁵ Van Dillen, *Rijkdom en Regenten*, 400. On the lack of technological change in ship-building after the first half of the seventeenth century, see Unger, *Dutch shipbuilding*, 41 and 86.

⁴⁶ The main exception being the use of wind-power in sawing, an innovation that stemmed already from an earlier date. *Ibid*, 7.

One of the most important leaps in efficiency undoubtedly was the result of the move to the new facilities at Kattenburg in the 1650s. Apart from allowing all equipment to be gathered at one place, reducing storage and transportation costs and enhancing the precision of administration, the new, much larger naval terrain also made it possible to concentrate and combine all sorts of secondary functions of shipbuilding in one location. The process of building and fully equipping a ship involved many different crafts. Tasks such as the production of tackle, anchorage and other ironwork, sails, and the making of prows and other embellishments, remained the work of small numbers of artisans and their apprentices. Most private shipbuilding companies at this time relied on independent, off yard craftsmen for these types of labor.⁴⁷ In the Amsterdam naval facilities, as at the VOC wharf, the different crafts were physically united with the primary functions of shipbuilding. Architect Daniel Stalpaert's own drawings already show the inclusion of a sail makers' shop inside the naval storehouse.⁴⁸ The incorporation of new crafts into the naval establishments was an ongoing process. In 1650 the work of a carpenter (or carpenters), roofer, glassmaker, plumber, and coffin maker were mentioned not under general wage costs but as accidental expenditure, including both their wages and materials. In 1680 this was the case for a bricklayer and a glassmaker, but the others had disappeared from the list, suggesting their inclusion under general wage costs.⁴⁹ In 1662, a resolution granted a wage increase of 150 guilders a year to a master carpenter, signifying that this function had already been created as part of the permanent workforce before that year.⁵⁰ The lists of workers of the middle and late eighteenth century, summarized in table 1, show the measure of integration and internal differentiation of the Amsterdam Admiralty workforce. Only a minority of highly specialized jobs, such as the work of glassmakers, was still done off-yard at the end of the eighteenth century.⁵¹

The smaller Admiralty Boards did not achieve the same heights in combining different forms of labor as the Amsterdam Board. The shipyards of Zeeland in particular never managed to lose their dependence on off-yard craftsmen for auxiliary tasks. But the dockyards at Rotterdam and Hellevoetsluys did see some development in this direction. In 1655 the States General had ruled that the Rotterdam Admiralty Board could employ not more than one sail maker for the purpose of repair. The making of new sails, rigging, anchorage, tackle, and

⁴⁷ Van Kampen, *Particuliere scheepsbouw*, 155 ff.

⁴⁸ D. Stalpaert, 'Plattegrond van het magazijn met bruggen en huisjes', 1656, SA, Collectie bouwtekeningen, no. 010056916934.

⁴⁹ NA, Archief Van der Hoop, no. 161. 'Notitie van Tractementen en Pensioenen Amsterdam', 10.

⁵⁰ *Ibid.*, 4.

⁵¹ The 1781 account of the Amsterdam receiver general include a payment of f1218 for glasswork to Benjamin van Oort. NA, Archief Generaliteitsrekenkamer, no. 592. 'xve ordinaris Reekening van Mr Joan Graafland de Jonge'.

carpenters' work, as well as any large repairs on ships should be tendered to contractors.⁵² But by the middle of the eighteenth century, the same institution employed several sail makers, carpenters, coopers, a master blacksmith with nine servants in Rotterdam and three blacksmiths in Hellevoetsluys, block makers, and a master painter with an apprentice and four servants. The fact that they seized to operate as independent craftsmen and were now in full service of the Admiralty Board also appears from the ruling that prohibited the master painter from doing work for any off-yard clients.⁵³

The drawing of all these different functions of production into one single institution, separated both physically and symbolically from the outside world by its walls, set the stage for new approaches to the organization and supervision of production. Amsterdam again provides the clearest example. There, important changes in the internal hierarchy took place at the same time as the move to new facilities and the increase in shipbuilding at the Admiralty wharf. The highest official working on the naval shipyard was the master of equipment. Before the move to the new facilities he had received *f* 400 above his regular salary of *f* 2400 for the renting of a house. But from 1656 onwards the master of equipment lived on a house on the shipyard itself, enhancing his ability for control. In 1662, around the time that shipbuilding at the naval yard took off on a large scale, his salary was raised with 600 guilders a year to the ample sum of *f* 3000. This was motivated by 'the growth of equipment and the big change of this Board since a few years, by which his task had become noticeably enlarged'.⁵⁴ In February of the same year, two sub masters of equipment, an accountant for the naval storehouse, and one for the shipyard were added to the payroll at a yearly salary of *f* 1095.⁵⁵

Through the master and sub-masters of equipment, the Admiralty Boards gained far greater control over the entire process of production than they had had previously. The description of the functioning of the smaller Rotterdam shipyards in the eighteenth century makes clear how far-reaching the ideal of supervision went:

'The storehouses and dockyards of Rotterdam and Hellevoetsluys, which are entrusted to the care of the Admiralty Board of the Meuse, are in the first place and immediately governed by

⁵² *Recuëil van alle de placaten, ordonnantien, resolutien, instructien, lysten en waarschouwingen, betreffende de admiraliteyten, convoyen, licenten en verdere zee-saaken*. Volume II (The Hague 1701) 392 vso.

⁵³ NA, Archief Van der Hoop, no. 153. 'Secrete missiven', 30 June 1751', 17.

⁵⁴ NA, Archief Van der Hoop, no. 161. 'Notitie van Tractementen en Pensioenen Amsterdam', 1.

⁵⁵ *Ibid.*

the Board itself, outside whose knowledge the servants are hardly allowed to do anything, except small repair'.⁵⁶

The master of equipment was to implement this strict control by his permanent presence on the naval facilities:

'[H]e must be at the wharf or storehouse daily, in order to advance the equipment and shipwrights' work, and to make sure that the bosses and workers keep to their duties, and if he discovers any disorders, or finds anyone disobedient, he has to immediately notify the Board.'⁵⁷

Of course, certainly at the Amsterdam shipyard, control over the entire workforce could not be gained by a staff of one master of equipment and two sub-masters. Accountants, supervisors, and guards all had a function in restructuring the hierarchy of work. One of the main changes in this area was the elevation of the position of the master shipwright to a level far above that of ordinary workers. Before the move to Kattenburg the master shipwright had received a day wage of fifty *stuyvers* (*f*2.5) in summer and winter. This was about double the wage earned by ordinary shipwrights, but the fact that the master was still paid for a days' work shows how similar their positions still were. In 1654 a gratification of *f*200 per year was granted for 'ordinary and extraordinary services', increasing the social difference. But the real change came in October 1661, when the master shipwright was granted a yearly *tractement* (the term itself marking the difference with a worker's wage) of *f*1800. Such an income, about six times as high as that of an ordinary worker, put him far above the shop floor in social terms.⁵⁸ From that moment on master shipwrights had joined the ranks of the higher management of the shipyard. This process of differentiation continued during the eighteenth century. By 1781 the salary of the master shipwright stood at *f*2500, supplemented by an allowance for the rent of his house, several gratifications, and a reward for every ship built at the wharf. His staff joined in this advance. Before 1733 the first journeyman, the oldest journeyman, and the ordinary journeyman all earned approximately one and a half times as much as ordinary shipwrights, while his clerk earned a workers' wage. By the end of the century the first journeyman earned more than *f*1100 (including gratifications) and lived in a

⁵⁶ NA, Archief Van der Hoop, no. 153, 'Secrete missiven', 30 June 1751', 11.

⁵⁷ Ibid, 14.

⁵⁸ NA, Archief Van der Hoop, no. 161. 'Notitie van Tractementen en Pensioenen Amsterdam', 4.

house free of rent at the shipyard, while the others received salaries of *f* 730, about twice the amount of an ordinary shipwright.

While those master craftsmen who managed to move up in the chain of command and obtain controlling positions over the work process as a whole saw structural improvement in their salaries, those who became mere supervisors or coordinators often faced a decline in status and income. This is particularly true of the shipwright's bosses or *commandeurs*. Master shipwrights who owned their own yards often held a social position that was more akin to that of well-to-do citizens than to that of ordinary craftsmen.⁵⁹ But in the course of the seventeenth century on the larger shipyards, including large private shipyards, they started to leave direct control over the workforce to their journeymen. These functioned more as gang leaders than as traditional craftsmen, a functional shift signified by the use of the term *commandeur*. Sub-bosses were called *Javanen* (Javanese), possibly reflecting strongly held perceptions of harsh Asiatic labor discipline. With forty-four workers per boss in 1733 and fifty-eight in 1781, the *commandeurs* at the naval shipyard controlled a workforce that was akin to that of a large or medium sized shipyard. But with thirty-six *stuyvers* in summer and twenty-six in winter (after 1733 raised to thirty-eight and thirty *stuyvers* respectively), their wage stood much closer to that of the ordinary workers below them, and at the same level as that of guild members on private wharfs.

Table 4 shows the fluctuations of income of a number of bosses in other crafts, ranked according to their 1781 income. As can be seen from this table only the blacksmith's boss, sail makers' boss, and boat makers' boss made considerable gains over the course of the eighteenth century, maybe due to the fact that their workshops always remained more or less separate islands within the shipyard organization. Some, such as the bosses of mast makers, block makers, and painters, suffered a marked decline in income. The others had incomes from wage that were the same or only slightly higher at the end of the eighteenth century than at the start, around one and a half times that of their subordinates.

⁵⁹ Van Kampen, *Particuliere scheepsbouw*, 178 ff, and Deurloo, 'Bijltjes en klouwers', 21.

Table 4 **Yearly income of bosses at the naval shipyard in the eighteenth century**
(based on 226 working days)

	1733	after 1733	1781
Blacksmith's boss	531	664	797
Mast makers' boss	593	531	531
Sail makers' boss	478	611	531
Boat makers' boss	445	664	505
Shipwright's boss	445	478	478
Carpenter's boss	478	531	478
Block makers' boss	624	531	478
Painters' boss	437	531	398
Carrier's boss	n.a.	n.a.	318

Sources: NA, Archief J.C. van der Hoop, no. 153. 'Secrete missiven', 30 June 1751, and NA, Archief Admiralteitscolleges XXXIX, J.C. van der Hoop (1524-1825), no. 104. 'Daglonen'.

Probably as significant for their income position as their formal wage was the attack on bonuses and gratifications that took place from the 1730s onward. The spike of most *commandeurs'* incomes after 1733 is due to the fact that before that time many bosses and some selected workers had received gratifications in the form of firewood or candles. The regulation of 1733 ruled that the gratification in firewood would be replaced by a sum in money, varying from twenty to fifty guilders, but it is likely that these sums were often below the actual value of the previous rewards in kind. The right to receive candles would be 'mortified', meaning that it was kept in place for those who already possessed this right but not for their successors.⁶⁰ New regulations introduced in 1744 limited the entitlement to a monetary compensation for firewood to a select group of managers, consisting of the master and sub-master of equipment, the master shipwright and his oldest apprentice, the clerk (*commis*) of the wharf, one skipper, and the controller of the nail shed.⁶¹ For *commandeurs* the taking away of their entitlement to firewood signified a real shift. They had gradually been degraded from specialized craftsmen to high-paid workers in supervising positions. In August 1748, when workers of the shipyards marched through Amsterdam in support of the Orangist

⁶⁰ NA, Archief Van der Hoop, no. 153. 'Secrete missiven', 30 June 1751', 41, and 54-56.

⁶¹ Ibid, 74-76.

revolt against the city governors, one observer notes the presence of ‘all the masters of the wharfs’.⁶² Earlier that year, the directors of the naval shipyard had found it necessary to summon all *commandeurs* and read them the States General’s declaration against seditious movements, to which they added their own ‘serious threats’.⁶³ It is hard to imagine that the semi-proletarianization of those most directly responsible for the coordination and control of work would not have played a role in the radicalization of the shipyard workforce.

Of time, theft, and chips

The restructuring of labor relations on the shipyards did not go completely unchallenged, all the more because it raised both wage issues and powerful notions of the ‘ancient rights’ of guild workers. On 6 February 1749 between six and seven in the evening, Lieutenant-Admiral Cornelis Schrijver faced an uncommon adversary. Schrijver was a highly respected naval officer, though posterity remembers him better for his achievements behind an administrator’s desk than for his deeds at sea.⁶⁴ In this particular mission, the Amsterdam Admiralty Board had again called on him more for his diplomatic than for his martial capacities. In the charged atmosphere that held the Republic in its grip since the stormy, protest ridden advent of William IV to the *Stadtholderate* in 1747 – especially in Amsterdam where a popular Orangist revolt had led to the abdication of part of the city council in the late summer of 1748 – Schrijver had to convince the shipwrights of the Admiralty shipyard that there was no room to give in to their demands. To add to his discomfort, the shipwrights had in their turn sent a hero of their own, Jan Martini, to head their delegation of six. Martini was not a shipwright, but had been one of the leaders of the radical fraction of the Revolt the previous year. He had even led a demonstration of two thousand Admiralty and VOC workers through Amsterdam, dressed in traditional shipwrights’ garb, to the great distress of defenders of law and order on both sides of the main political dividing line.⁶⁵ As could be expected from such a firebrand, when the delegation had come to Schrijver’s house at the fifth of February to list the

⁶² L.Fuks (ed), *De zeven provinciën in beroering. Hoofdstukken uit een Jiddische kroniek over de jaren 1740-1752 van Abraham Chaim Braatbard* (Amsterdam 1960) 79.

⁶³ Adolf Ypey, *De beroerten in de Vereenigde Nederlanden. Van den jaare 1300 tot op den tegenwoordigen tyd.* Volume XI (Amsterdam / Harlingen 1789) 142.

⁶⁴ J.R.Bruijn, ‘Cornelis Schrijver (1687-1768)’, in: L.M.Akveld, Ph.M.Bosscher, J.R.Bruijn, and F.C. van Oosten (eds), *Vier eeuwen varen. Kapiteins, kapers, kooplieden en geleerden* (Bussum 1973) 161-175.

⁶⁵ *Vervolg op de korte schets of dag-verhaal van het tegenwoordige gedrag der burgeren van Amsterdam* (s.l. 1748) 107, 111, and P. Geyl, *Revolutiedagen te Amsterdam (Augustus-September 1748)* (The Hague 1936) 56 and 95.

shipwrights' demands, 'aforementioned Martini absolutely refused to listen to anything, no matter what persuasive reasons the undersigned brought forward.'⁶⁶ When his persuasive reasons did not seem to impress his adversary, Schrijver took resort to open threats. The Admiralty Board and the VOC, he explained, could not be forced into granting demands either by the shipwrights, or even by city government 'which had power only over its citizens (...), but not in any way over the Admiralty Board and the Company'. Higher wages, in this case two *stuyvers* a day for guild members, would lead to instant ruin, causing 'the wharf to come to a standstill, for lack of the necessary funds to buy wood and pay the carpenters their day wages; particularly when the Admiralty Board would further be burdened (...) if the shipwrights would gain the upper hand, and came to carry through their demands by force and violence.' And so, the next day, a group of fifty or sixty shipwrights led by Martini returned to Schrijver's house,

'shouting out in a violent way, with swearing, raging and the most unmentionable curses and threats: yelling that undersigned [Schrijver] had no business engaging himself with their guilds. And having lit a fire of wood curls, they burned a printed plan that was written by undersigned to make them and their heirs forever happy.'⁶⁷

Unable to bring together their diverging views on eternal happiness and the two *stuyvers* wage raise, the shipwrights later that year turned directly to the stadtholder. In December 1749 they presented him with a request complaining about wage levels that were considerably lower than those among private sector shipwrights, exemptions that allowed the Admiralty Board to employ non-guild labor, irregular payment, and the low quality of beer served during work. However, unlike Martini and his delegation, William IV did have an ear for Schrijver's persuasiveness, and only admonished the Admiralty Board to comply with the demands on beer and regular payment. As far as the wage raise was concerned, he explained that 'his Highness was not unwilling to take favorable reflection on it when times get better'.⁶⁸ Day rates of Amsterdam shipwrights remained unchanged until the second half of the nineteenth century.

The disciplining of the workforce at the naval shipyards according to the requirements of large scale manufacture was a long and uneven process. It did not only involve the

⁶⁶ NA, Familiearchief Fagel. no. 1099, 'Raport van den Luitenant Admiraal Cornelis Schrijver omtrent zijn wedervaren met de clouwers van het sloopstimmermans gilden'.

⁶⁷ Idem.

⁶⁸ NA, Archief Stadhoudelijke Secretarie, no. 467. 'Request aan Willem IV van 6 december 1749'.

introduction of new hierarchies, but also the challenging of long-held perceptions of the nature of work, time, leisure, property, and consumption on the job. Resistance ranged from the most individual methods, such as absenteeism and theft, to collective action in the form of strikes and involvement in political protest. Such themes play a large role in the historiography of the 'making of the working class', but have hardly been researched for the early modern Dutch Republic.⁶⁹ The typical approach for the Netherlands remains the one recently summed up by Jan de Vries, who agrees that eighteenth century labor patterns underwent revolutionary changes, but criticizes what he sees as the 'pessimist' view, instead insisting that workers benefited from these changes even when they had to be enforced: 'After the manner of Ulysses requesting to be tied to the mast of his ship as it sailed past the sirens, factory discipline forced workers to do what they wanted to do but could not do unaided.'⁷⁰ However, it is hard to read this repressed urge for discipline from the actions of the laborers involved. During the eighteenth century, shipwrights gained a name for themselves as the most unruly section of the Amsterdam population. While much attention is given in Dutch historiography to the ideological component of this radicalization, stressing the role of shipwrights in the 'Orange revolutions' of 1748 and 1787, the fact that the naval and VOC shipyards were at the same time in the forefront of abolishing craft practices and replacing them by more elaborate forms of collective labor discipline has been virtually overlooked.

The transformation that took place in the position of shipyard workers can be summarized along the lines of a threefold shift, involving the introduction of new forms of time management, strong measures against practices that management defined as theft, and the loss of the laborer's control over tools and other materials used in production. As E.P. Thompson noted, the development of new notions of labor time was intimately connected with the development of manufacture on a large scale.

'Attention to time in labour depends in large degree upon the need for the synchronization of labour. But in so far as manufacturing industry remained conducted upon a domestic or small workshop scale, without intricate subdivision of processes, the degree of synchronization demanded was slight, and task-orientation was still prevalent.'⁷¹

⁶⁹ E.g. E.P. Thompson, *The making of the English working class* (London 1963), and John Rule, *The experience of labour in eighteenth-century industry* (London 1981).

⁷⁰ Jan de Vries, *The industrious revolution. Consumer behavior and the household economy, 1650 to the present* (Cambridge 2008) 115.

⁷¹ E.P. Thompson, *Customs in common* (New York 1991) 370.

Not surprisingly, given their size and the level of combination and internal coordination, the Amsterdam naval and VOC shipyards pioneered a system of strict time management. Symbolic for this was the inclusion of a large clock above the gate to the shipyard. Before the move to Kattenburg, no clock setter is mentioned in the account of personnel, but in 1680 a clock setter was employed for the yearly fee of *f* 80.⁷² From that time onward, strict rules applied for the exact length of the working day. Jan de Vries has calculated that between the sixteenth century and the 1650s, the number of working hours for manual laborers in general increased by twenty percent, from 3,100 to 3,700 working hours per year.⁷³ One surviving copy of the rules for work at the shipyard, from the rather late date of 1788, stated exactly the hours at which a bell should ring to mark the start and end of the workday, the morning break of half an hour and a break at noon of an hour. The length of the workday, excluding breaks, varied from 8 hours in January (at winter wage) to 11 ½ hours from April to the end of September (at summer wage).⁷⁴ Incidentally, this means that for all workers except for a skilled ‘elite’, wages per hour were much lower in summer than in winter. With large clocks at the entrances of the naval shipyard, the VOC shipyard, and at the tower of the church that was built right in between the two in the late 1660s, the daily passage of workers as well as their supervisors was always marked by the time.

One indication of the success in demarcating the labor day, as well as the exceptional nature of this achievement, is a remark in a request of skippers from 1731:

‘[T]hat at the naval and company yards there is observed a good order in arriving at work and quitting, as well as in the timing of breaks, while the journeymen at the [private] yards at which the suppliants are forced to have their ships built, come and go and have their breaks as long and protracted as they please’.⁷⁵

How deeply notions of time and discipline had become ingrained in the mind of the shipyard workers appears from a strike in Rotterdam in 1784. On March 8, the birthday of Stadtholder Willem V, they staged a rowdy celebration involving lots of drink on the yard. After wresting involuntary ‘gifts’ from a number of the bosses and the master shipwright, the crowd was granted leave at three in the afternoon. They then marched to the adjoining VOC yard and

⁷² NA, Archief Van der Hoop, no. 161. ‘Notitie van Tractementen en Pensioenen’, 6 and 11.

⁷³ De Vries, *Industrious revolution*, 89.

⁷⁴ NA, Archief Van der Hoop, no. 146A. ‘Reglement voor s’Lands werf, Eerste Deel, Rakende de Equipagie-Meester en de algemeene Ordres’, 5. Similar working hours applied in Hellevoetsluys around 1750. NA, Archief Van der Hoop, no. 153, ‘Secrete missiven’, 30 June 1751’, 19.

⁷⁵ Quoted in Van Kampen, *Particuliere Scheepsbouw*, 174n.

proceeded to the private shipyards in another part of town, while shouting ‘it strikes’ (meaning ‘the clock strikes for leaving work’). After that, some young workers broke into the Schiedam gate, where they sounded the bells.⁷⁶

Usually resistance against strict enforcement of labor time took a less frivolous and more individualized form. Unannounced absenteeism remained one of the great concerns of shipyard administrators. This was very clear during the 1730s and 1740s, when over-employment and the low level of work caused many workers to skip days, while still demanding their full pay. The *commandeurs* had the task of carefully administering the exact number of days worked, for which they used a so-called ‘checkers-board’. This was a square on which they could mark the days for each laborer with crosses. Apparently, however, there were reasons not to trust the accuracy with which the bosses carried out this task, since in 1733, new rules for work at the shipyard demanded an oath from them stating:

‘[T]hat I will not mark anyone as having worked on the naval yard, apart from those who effectively have worked there in the service of the nation during the complete prescribed time, and in the same function as is expressed on this list. That if I discover any mistakes in this work, I will immediately give notice of this to the proper authority, and further behave as a loyal *commandeur* is supposed to.’

The checkers-boards had to be handed over to the master shipwright or the sub-masters of equipment for control.⁷⁷

Apart from absenteeism, theft was a major issue in eighteenth century labor relations. As Peter Linebaugh showed for England, this was not only a result of pilfering being an easy way to supplement low wages, but also of colliding views on the nature of property itself. Waste materials such as unusable pieces of wood (chips or curls) often were seen as rightfully belonging to the craftsmen. This encouraged the bad handling of materials, since all spoiled pieces of wood could be appropriated by the shipwrights for their own use. The ‘battle over chips’ took management at the English shipyards the entire eighteenth century – in 1768 even leading to clashes between workers and marines.⁷⁸ Naval administrators in the Dutch Republic were far more successful on this account than their English counterparts. Already in 1671, former Amsterdam Admiralty councilor Nicolas Witsen could write about the great economy attained on Dutch wharfs, compared to the wastefulness in other countries. In his

⁷⁶ Ibid, 175-177.

⁷⁷ NA, Archief Van der Hoop, no. 153, ‘Secrete missiven’, 30 June 1751’, 42-44.

⁷⁸ Linebaugh, *London hanged*, 378-382.

then famous manual for shipbuilding, he ascribed this particularity to the frugal mentality of Dutch laborers:

‘From which follows, that even if a stranger would keep in mind all rules for building, they could not serve him, (...) unless he would see chance to equal the nature of the people, with which he has to work, to the thrifty and clean disposition of the Hollander, which cannot be done.’⁷⁹

This attitude of the worker was at least partly the result of the tighter administration and greater care in the storage of raw materials, semi-finished products and excess equipment that was introduced with the move to Kattenburg.

Order was a powerful weapon for management in the fight against workers’ appropriation of part of the stock. It is noticeable that in 1733, when the entitlement to firewood was replaced by a gratification in money, this right was already limited to a small section of the workforce, and the distribution was administered according to set rates that varied according to one’s position in the shipyard hierarchy. The anarchic practices at English shipyards, where workers at one point were able to carry out on their backs forty percent of all wood ordered for the building of a third rate ship, were absent in Amsterdam.⁸⁰ Instead, a special category of workers (called *spaanderrapers* or chip reapers) belonging to the lowest paid section of the workforce was appointed to collect chips. Set amounts of firewood divided into a *schuitje* (worth about twenty guilders), *roodgat* (about thirty guilders), or *boot* (about fifty guilders) were distributed among 165 members of the personnel, mainly belonging to the administrative cadre or the workmen’s bosses at the wharf. The only sections of workers entitled to firewood were guards, privileged servants of the staff, and a small group of workers such as cooks and firemakers who could probably have easily taken firewood for themselves anyhow. The total costs of these gratifications came at about *f* 4000.⁸¹ In 1744, when the right to gather chips was restricted to a small section of higher management, it was also decided that the Admiralty Board would no longer buy any firewood but instead would only use waste from the wharf. Shipyard waste was now officially turned into a commodity, in a ruling stating that

⁷⁹ Nicolaes Witsen, *Aloude en hedendaegsche scheeps-bouw en bestier* (Amsterdam 1671) introduction.

⁸⁰ Linebaugh, *London hanged*, 380.

⁸¹ NA, Archief Van der Hoop, no. 153, ‘Secrete missiven’, 30 June 1751’, 56.

‘even the chips and waste of the wharf will be sold, as it is, without cleaving either the chips or the blocks, but that both in the boardroom and the departments, as well as in the Admiralty residence in The Hague, only the best chips and waste of the wharf will be burned’.⁸²

Apparently this ruling was applied with success. Yeoman Lott, an English naval administrator who visited Holland in the 1750s, admiringly wrote about the ‘peculiar attention’ paid at the Amsterdam shipyard to waste management ‘prohibiting any Kind of Wood whatever, or Stores of any Kind, to be carried out of their Dock Yards by the Workmen, under the Perquisite of Chips, &c.’⁸³

Control against the mishandling or unlicensed appropriation of shipyard’s goods was also extended or strengthened in other areas. During the 1730s and 1740s many rules were introduced for the supervision and precise administration of goods that were not in current use. In 1748, for example, a shipwright was appointed for every ship that lay in the docks, with a duty to remain on this ship from the sounding of the bell in the morning to the closing of the yard in the evening. One of his tasks was

‘to take care that nothing is stolen or gone missing from this ship, to which aim a proper inventory will be made of all goods that are present on this ship in the dock. And of this inventory one copy will remain in the possession of the master of equipment, and one of the shipwright on this ship.’⁸⁴

Similar rules were introduced for the unloading and offloading of victuals and equipment.⁸⁵

Of particular interest are the attempts to limit workers’ access to those goods that were traditionally seen as belonging to them only. One was the beer consumed during work, the other the simple tools that were used. As a compensation for the absolute prohibition of smoking on shipyards, guild rules from the seventeenth century onwards had provided the workers with free access to beer as a ‘refreshment beverage’. Given the physical character of shipwrights’ labor, usually taking place in the open air, unlimited access to beer was seen as an essential right. However, already at the end of the seventeenth century Van Yk’s manual for shipbuilding had advised:

⁸² Ibid, 76-77.

⁸³ Yeoman Lott, *An account of proposals made for the benefit of His Majesty’s naval service* (London 1777) 5.

⁸⁴ UB-BC, *Extracten*. ‘Extract minute Amsterdams Admiraliteitscollege, 30 May 1748’.

⁸⁵ Ibid, extracts from the minutes of the Amsterdam Admiralty Board, 21 April 1734 and 29 August 1749.

‘[N]ot to allow that any beer will be carried along the wharf or around the place of work in jugs, but rather to summon everyone to drink in front of the barrel; because in this way, he [the master shipwright] will not only spare the wage of beer carriers, but also much beer, since most will be ashamed to walk away from their work too often under the eyes of the master.’⁸⁶

The naval and VOC shipyards had found an even easier solution to the problem of excessive drinking during work: providing beer that was undrinkable. In their request to William IV of December 1749 workers complained about the low quality of their ‘refreshment drink’, ‘being for a long time so bad that it cannot be used, and having given many deceases and inconveniences to those who for excessive thirst were nonetheless forced to drink it.’⁸⁷ Conceding to their complaint, the stadtholder summoned the shipyard administrators to make sure that from that moment on, good quality beer was provided to the workers. Interestingly enough, the list of workers of 1781 shows the employment of twenty-five ‘jug-fillers’ (*kantappers*), which had not been present at the wharf around the time of the workers’ complaint.⁸⁸ This could point in two very different directions. One possibility is that on the issue of drink, workers’ protest had resulted in a return to the seventeenth century practices that Van Yk had denounced. But it is also possible that the opposite happened, and management had used the introduction of better quality beer as an excuse for rationing. Unfortunately, the sources do not provide an answer on this matter.

More straightforward is the introduction of twelve *lappen* or guards of the tools around the same time. With a day wage at the same rate as shipwrights, these were considerably better paid than ordinary guards who received no more than sixteen *stuyvers* a day in summer and fourteen in winter. The introduction of this group of well-paid supervisors must have signified a lessening of control of the workforce over the tools they used. Traditionally, the smaller tools that shipwrights worked with had been in their own possession, while the larger tools were supplied at the wharf.⁸⁹ How freely the shipwrights, or ‘axes’ (*bijltjes*) as they were popularly called, had previously commanded these simple tools appears from their role in the Orangist revolt of 1748. At several strategic turning points, the dividing line between moderates and radicals had been drawn at the question whether the ‘axes’ should demonstrate

⁸⁶ Cornelis van Yk, *De Nederlandsche scheeps-bouw-konst open gestelt* (Amsterdam 1697) 24.

⁸⁷ NA, Archief Stadhoudelijke Secretarie, no. 467. ‘Request aan Willem IV van 6 december 1749’.

⁸⁸ Given their wage of 5 to 7 *stuyvers* a day possibly children.

⁸⁹ Unger, *Dutch shipbuilding*, 61.

with or without their axe.⁹⁰ But the employment of a number of specified ‘toolmakers’ among the Admiralty workforce after 1744 signifies that tools at an increasing rate were supplied by the shipyard and considered property of the institution.

By the end of the eighteenth century there was no other sector of industry in the Dutch Republic where craft practices in production had so successfully been challenged and replaced by new conceptions of time management, property, hierarchy and control as at the large naval shipyards. While shipwrights’ manuals from the seventeenth century show that shipyard managers could start this transformation from a more advantageous position than their English counterparts, the crucial years in the transition were centered around the 1730s and 1740s, or the so-called ‘quiet years’. The financial crisis that beset the Admiralty Boards was a strong motivation for naval bureaucrats to challenge practices that they considered wasteful and costly. They did so with a vigor that they never managed to muster in reviewing other potentially costly and wasteful areas of naval production, such as the costs of the shipyard bureaucracy itself, and with considerably more success.⁹¹ The 1740s lull in naval shipbuilding must have further strengthened the position of management vis-à-vis the shipyard workforce. When in September 1749 the shipwrights rallying in front of Schrijver’s house cried out that he should respect their rights as guild workers, this was much more than the rehearsal of a well-known theme.⁹² It also referred to a whole catalogue of recent defeats, which the shipyard workers hoped but ultimately failed to redress.

Conclusions

Early modern naval shipyards were among the largest, if not the largest, production facilities of the early modern period. Taking care of the building and equipment of entire war fleets, they also were the focus of large scale supply. Therefore these institutions have drawn increased attention among historians interested in the development of bureaucratic management practices, the interplay between states and markets, and the evolution of labor relations. This paper has focused on the latter subject, to show how state-shipyards operated at

⁹⁰ E.g. *Het ontroerd Holland* (Harderwijk s.d. [ca.1750]) 148-149. A year earlier, shipwrights in Zierikzee had turned out for an Orangist protest ‘with their axes at their shoulder’. J. de Kanter, *Chronijk van Zierikzee* (Zierikzee 1795) 176.

⁹¹ Bruijn, *Admiraliteit van Amsterdam*, 62.

⁹² Rudolf Dekker, *Holland in beroering. Oproeren in de 17^{de} en 18^{de} eeuw* (Baarn 1982) 79, and Deurloo, ‘Bijltjes en klouwers’, 56ff.

the frontline of introducing 'modern', capitalist forms of interaction between management and the (potential) workforce. It has also shown the continued dynamism of these practices during the eighteenth century. Far from being lethargic, Admiralty councilors energetically restructured the organization of work, especially in the face of the financial crisis of the 1730s and 1740s. This study has also demonstrated the social significance of this type of 'efficiency', pointing out how the advance of economic rationality went hand in hand with sharp hierarchic and income differentiation between management and the workforce, and the challenging of guild practices pushing shipwrights to become one of the most militant sections of the eighteenth century Amsterdam laboring classes. Whereas on British shipyards older practices such as the 'right to carry chips' were not eradicated until the nineteenth century, the completeness with which the Amsterdam shipyard was subjected to a 'commodity regime' in which even the smallest bits of waste were considered property of the institution testifies to the thoroughness with which the capitalist attitudes of management were followed through into the minutest details of work relations.