

TECHNOLOGICAL CHANGE AND THE PROFESSIONALISM OF MASTERS AND MATES IN THE DUTCH MERCANTILE MARINE, 1815-1914

BY

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1. Introduction

The impact of the Industrial Revolution on the Dutch mercantile marine first became perceptible in the 1820s. In 1823, the "Nederlandsche Stoombootmaatschappij" (NSM, Dutch Steamship Company) was founded in Rotterdam. Amsterdam followed suit with the foundation of the "Amsterdamsche Stoomboot-Maatschappij" (ASM, Amsterdam Steamship Company). Both companies started to operate regular services on inland waterways as well as across the North Sea¹. In the Dutch East Indies, a regular commercial steamship service was opened between Batavia and Surabaya in 1826².

For several decades steam navigation remained a phenomenon of only marginal importance, however. In 1824, the Dutch mercantile marine – just starting to recover from heavy losses during the Napoleonic Wars – numbered 1,097 sailing vessels with a capacity of 289,573 m³³. In 1850 its size had grown to 1,781 ships under sail (822,784 m³), while the total number of steamers amounted to only 12 (7,682 m³). During the 1850s the diffusion of steam power somewhat accelerated. As the size of the Dutch merchant fleet reached its 19th-century peak in 1858, the number of steamships stood at 41 (28,606 m³) as against 2,397 sailing vessels (1,271,110 m³).

Between 1860 and World War I the balance finally dipped in favour of steam. While the number of sailships fell sharply – with a dramatic plunge about 1870 –, the total of steamships was steadily on the increase and so was their capacity. At the turn of the century, the figures were 425 (222,134 m³) and 213 (759,657 m³), and

¹ M. G. DE BOER, *100 Jaar Nederlandsche scheepvaart*, Den Helder/Amsterdam, 1939, pp. 80-82.

² F. J. A. BROEZE, *The International Diffusion of Ocean Steam Navigation. The Myth of the Retardation of Netherlands Steam Navigation to the East Indies*, in: *Economisch- en Sociaal-Historisch Jaarboek*, 45, 1982, pp. 77-95, esp. p. 79.

³ The figures on the capacity of the Dutch merchant fleet are derived from H. WIJN, *Aanmonstering en arbeidsplaats ter koopvaardij in de 19de eeuw: een reconstructie*, in: *Leidschrift*, 1, 1984, pp. 24-55, esp. pp. 44-47, and the *Jaarcijfers voor het Koninkrijk der Nederlanden. Rijk in Europa 1914*, Den Haag, 1915, p. 256 (standardized for m³).

in 1914 402 (133,434 m³) and 407 (2,036,670 m³) respectively. Although there was still a sizeable number of sailships at the start of World War I, the proportion of these to the total capacity of the Dutch merchant fleet had become insignificant.

The growth of steam navigation was related to further changes in technology. The adoption of the screw and the compound engine with surface condenser in the second half of the 19th century allowed for a significant extension of the area in which steamship services could be operated at a profit. During the 1850s and early 1860s the network of routes was extended to the Baltic, France and the Mediterranean. Steam packet services were developed in the East Indies. In the seventies, the steamship ousted the sailing vessel from the routes between the Netherlands and the East Indies as well as between the Netherlands and the U.S.A. During the next quarter of a century, as the introduction of the triple-expansion engine enhanced the advantage of steam over sail, the range of Dutch steamship navigation was further extended to include the West Indies, South America and the seas between Indonesia, China and Japan.

The changeover from wood to iron did not really get under way till the 1870s, although a number of iron ships were added to the merchant fleet as early as the late 1840s and 1850s. The first one was the brigantine "Industrie", built for the shipowner Willem Ruys from Rotterdam in 1847⁴. Before 1880, all the iron ships were either steamers or sailing vessels for the ocean-going trade, though after that, the innovation spread to the sailing fleet for the hometrade as well. In the 1890s steel replaced iron as the prime material for the construction of Dutch ships⁵.

The theme of this paper is the impact of these technological changes between 1815 and World War I on the professionalism of masters and mates in the Dutch merchant service⁶. Professionalism is conceived as the tendency to cultivate specific professional knowledge, promote special professional training and tests of competence, and develop distinct organizations to uphold the values, norms and interests of the profession concerned. I will try to show, how professionalism grew between 1815 to 1860 and how subsequently, partly under the influence of changes in technology, both its nature and source were transformed. After about 1860, the "autonomous" professionalism that had developed in the Dutch merchant service during the early 19th century gave way to another variety: "controlled" professionalism.

⁴ B. W. TIDEMAN, *Schepen van ijzer of staal*, Amsterdam, 1868, pp. 4-5; A. BLUSSÉ VAN OUD-ALBLAS, *De geschiedenis van het clipperschip in Noord-Amerika, Engeland en Nederland*, Amsterdam, 1972², pp. 136-137; E. W. PETREJUS, *Het schip vaart uit. Onze zeilvaart in de negentiende eeuw*, Bussum, 1975, pp. 136-140; H. REUHLIN, *Handelsvaart*, in: R. BAETENS a.o. (eds.), *Maritieme Geschiedenis der Nederlanden*, vol. 4, Bussum, 1978 (=MGN), pp. 224-271, esp. pp. 228-229.

⁵ In this paper I will not deal with further technological changes such as the introduction of electricity, radio-telegraphy and the diesel engine, the full impact of which was not felt until after World War I.

⁶ On the professionalism of navigating officers in general, see G. M. W. ACDA, *De ontwikkeling van het beroep van scheepsofficier*, in: *Tot een rechtschapen en kloek zeeman toe te rusten. Tweehonderd jaar Kweekschool voor de Zeevaart en Hogere Zeevaartschool Amsterdam*, Zutphen, 1985, pp. 51-83.

2. The rise of autonomous professionalism, 1815-1860

Apart from naval officers, there was one category of Dutch seafarer that clearly showed characteristics of professionalism well before the end of the 18th century: the masters and mates of the Dutch East-India Company (VOC)⁷. The VOC, founded in 1602, held the monopoly of shipping between Asia and the Netherlands. The rise of professionalism within the VOC started with the development of a system of examinations. By the second half of the 18th century, this had grown to such an extent that all navigating officers were subject to tests of competence in seamanship and the art of navigation, both at the beginning of their service with the Company and at any subsequent transition stages in their career. Moreover, elaborate rules governed their operations at sea. These applied particularly to the keeping of logbooks and the handling of navigational instruments supplied by the VOC. This drive towards professionalism originated with the directors and their technical advisers rather than with the officers themselves. Masters and mates were being forced to comply with standards set by their employer.

Although the VOC was brought under public ownership as a result of the Batavian Revolution of 1795, the monopoly was not lifted until 1805⁸. As the Dutch possessions in the East were temporarily lost to the British, it took some time before the full consequences of the change could be felt. When the East Indies returned to Dutch rule in 1816, a number of Dutch shipowners immediately availed themselves of the new opportunities offered by the revival of the Asia trade. On the whole, the Dutch shipping industry was unable to cope with foreign competition, however. In order to bring the trade between Asia and the Netherlands firmly back under Dutch control, the government assigned a key role to a new organization, founded in 1824, the "Nederlandsche Handel-Maatschappij" (NHM). The NHM, set up as a limited company with strong support from the government, was commissioned to purchase government products in the Indies for resale in the Netherlands and was granted the monopoly in shipping government products to and from the colony in the East. Unlike the VOC, the NHM was as a rule not to operate its own ships but act as a freighter. According to its memorandum of association, the company was obliged to make exclusive use of ships flying the Dutch flag, commanded by Dutchmen and built on shipyards in the Netherlands or in one of the Dutch colonies⁹.

⁷ On the professionalism of naval officers, see J. R. BRUIJN, *De Admiraliteit van Amsterdam in rustige jaren 1713-1751*, Amsterdam, 1970, ch. 4, esp. pp. 122-133; Ph.M. BOSSCHER, *Oorlogsvaart*, in: *MGN*, vol. 3, pp. 353-394, esp. pp. 373-374; on officers of the VOC, see C. A. DAVIDS, *Zeewezen en wetenschap. De wetenschap en de ontwikkeling van de navigatietechniek in Nederland tussen 1585 en 1815*, Amsterdam/Dieren, 1986, pp. 294-295.

⁸ E. S. VAN EYCK VAN HESLINGA, *Van Compagnie naar Koopvaardij. De scheepvaartverbinding van de Bataafsche Republiek met de koloniën in Azië 1795-1806*, Amsterdam/Den Haag, 1988, pp. 13, 166, 175-176.

⁹ W. F. MANSFELT, *Geschiedenis van de Nederlandsche Handel-Maatschappij*, 2 vols., Haarlem, 1924, vol. 1, ch. 2.

This protectionist policy of the NHM was the single most important factor in the remarkable recovery of Dutch shipping and shipbuilding from the mid-1820s onwards. The revival received an additional boost from the introduction of the Culture System into the East Indies in 1830. The adoption of the system, which entailed the regular use of forced labour on government plantations, led to a big increase in the volume of produce to be carried to the Netherlands and consequently to an even greater expansion of the Dutch merchant fleet. Between 1831 and 1840 the number of ships rose from about 1,250 to about 1,630, while the total capacity almost doubled. The number of frigates fit for the voyage to Asia even increased from 101 to 216, with their capacity more than trebling¹⁰. As a response to the growing over-capacity the NHM adopted a rota system in 1841, restricted to the ships already in service or still under construction; later the restriction was dropped, although the system itself remained in force. It should be emphasized, however, that the trade to and from the East Indies, albeit crucial for the recovery of the Dutch mercantile marine, did not comprise the entire ocean-going trade. At the end of the Napoleonic Wars it did not take long before Dutch ships were (again) sent to Japan, China, the U.S., the west-coast of Africa and the east-coast of South America. In the late 1840s and 1850s Dutch merchantmen also regularly sailed to Chile, Peru, California and Australia, sometimes en route to Java. And besides the ocean-going trade there was of course the home trade. A large number of Dutch ships, many of them belonging to shipowners in the province of Groningen, plied the European waters from the Baltic down to the Black Sea.

While the East Indies trade no longer remained the preserve of a select group of navigators employed by the VOC, professionalism was spreading, too. To some extent its growth was deliberately encouraged by the national authorities. In 1823 the government decided to appoint public lecturers in mathematics and navigation in the four main port-cities of the then United Kingdom of the Netherlands: Amsterdam, Rotterdam, Antwerp and Ostend. The teachers were charged to give free instruction to anyone who wished to be trained as a pilot for the Navy or the mercantile marine. According to the regulations issued on October 12, 1823, the courses were to encompass the entire field of the art of navigation, ranging from elementary mathematics up to the determination of longitude by the method of lunar distances. Simultaneously, the state introduced examination facilities for mates in the merchant service; these were, in fact, the same as those for mates in the Navy. While the examinations for the latter category were compulsory, those for the former were optional, however. Moreover, they pertained only to theoretical subjects. Candidates were not interviewed about their knowledge on seamanship or commercial practice¹¹.

¹⁰ R. T. GRIFFITHS, *Industrial Retardation in the Netherlands 1830-1850*, Den Haag, 1979, p. 94.

¹¹ C. A. DAVIDS, *Het zeevaartkundig onderwijs voor de koopvaardij in Nederland tussen 1795 en 1875. De rol van het Rijk, de lagere overheid en het particuliere initiatief*, in: *Tijdschrift voor Zeegechiedenis*, 4, 1985, pp. 164-190, esp. pp. 166-170.

In the Northern Netherlands both initiatives ended in almost complete failure. The public lectures in Amsterdam and Rotterdam were hardly attended. At an inquiry by the NHM among the 168 captains of ships chartered by the company in 1851, it turned out that 106 of them (63%) had never sat an examination. Among the 62 who had once passed a test of competence, less than 44 (26%) had done so before the examining board appointed by the state¹².

Developments in the Netherlands at this point diverged from those in Britain¹³. It is well known that the British Board of Trade established optional examinations for masters and mates in 1845. Soon afterwards the Admiralty decided that no vessels could be chartered as a transport, convict ship or freight ship unless the masters and mates held a certificate of qualification. This regulation also applied later to Post Office packets; in consequence, the number of examinees sharply increased. Under the Mercantile Marine Act of 1850 examinations were made compulsory, and examining boards were established in the leading ports of the realm. The Chief Examiner of the London Local Marine Board was commissioned to set the standard for the examinations held in other port-cities. From 1853 onwards, every major port also saw the establishment of a school of navigation. These schools, which duly prepared seamen for the tests of competence, were initially sponsored by the Board of Trade and later by the Science and Art Department of the Board of Privy Council for Education.

In the Netherlands the drive towards professionalism in the merchant service originated from below rather than from above. The fiasco of the government's efforts in the 1820s did not spell the breakdown of professionalization. The real motive power for the growth of professionalism was supplied from other sources. Let us take a look at three aspects: professional training, tests of competence and professional organization.

Between 1815 and 1860, there was definitely no lack of interest in nautical education in the Netherlands. In many towns and villages new facilities for nautical instruction were established without the government being involved in or even being aware of the fact! These provisions were of different kinds¹⁴. The rarest was the instruction offered by public lecturers sponsored by local authorities or private organizations. Secondly, there was the instruction provided by private teachers of navigation in port-cities or in maritime communities. In Amsterdam there were seven of them in 1860, as against one in 1827. In the third place, nautical education was

¹² DAVIDS, 1985, pp. 169 and 176; F. J. A. BROEZE, *De stad Schiedam. De Schiedamsche scheepsrederij en de Nederlandse vaart op Oost-Indië omstreeks 1840*, Den Haag, p. 123.

¹³ C. JEANS, *The First Statutory Qualifications for Seafarers*, in: *Transport History*, 6, 1973, pp. 248-267; A. KENNERLEY, *Navigation and Training Ship: Educational Provision in Plymouth for the Mercantile Marine in the Nineteenth Century*, in: S. FISHER (ed.), *West Country Maritime and Social History: Some Essays*, Exeter, 1980, pp. 53-78, esp. pp. 53-62; A. G. COURSE, *The Merchant Navy. A Social History*, London, 1964, pp. 210-213.

¹⁴ DAVIDS, *op. cit.* (1985), pp. 170-177 and 182-185.

supplied at many primary schools in the western and northern provinces ; schoolmasters or assistant schoolmasters were sometimes explicitly required to show proficiency in the art of navigation. During the years between 1815 and 1860 this facility was established at a number of places where it had not existed in 1800, although such proliferation was probably not as wide as it had been in the late 17th and the 18th centuries. Finally, there were the schools of navigation established by the local or provincial authorities or by private organizations. Some of these evolved from primary schools with facilities for nautical instruction or formed part of broader technical institutions, while others were planned as schools of navigation from the start. In the early 1860s there were many more of them than had ever existed before 1800 and the number of pupils enrolled was far higher than in the past.

The most famous – though not the most typical – school of navigation was the “Kweekschool voor de Zeevaart” in Amsterdam, founded in 1785. The “Kweekschool”, run by a private organization, was a residential college of education aimed mainly at training boys for the position of navigating officer in the mercantile marine (and, up to 1828, in the Navy as well). The curriculum included general education, courses on seamanship and the art of navigation, and a probationary period at sea. The school issued its own qualification certificates. The curriculum at other schools of navigation founded before 1850 – e.g. those in Groningen, Harlingen and Rotterdam – was geared to the state regulations of 1823 on the teaching of navigation and the examination of mates. The 1850s saw both a rapid expansion in the number of schools and a shift in their orientation. New schools of navigation were built from scratch or created by the reorganization of existing primary schools in Dordrecht, Hoorn, Zwolle, Veendam, Delfzijl, Assen, Nes on Ameland, Krimpen aan de Lek, Alblasterdam and Amsterdam (in the “Zeemanshuis”). Instead of training seamen to pass state examinations, they served to prepare them for tests of competence taken before examining boards appointed by local authorities ¹⁵.

The local examining boards, set up in the middle of the fifties, completely replaced the examination facilities provided by the state. The first was installed in Rotterdam in 1854, the other main port-cities Amsterdam and Dordrecht following suit. Between 1856 and 1858 boards were also established in Middelburg (the capital of Zeeland) and in five towns in the northern provinces. The formation of these committees was triggered by a breakdown in negotiations between the government and the rival ports of Amsterdam and Rotterdam concerning reform of the state-sponsored examination system. Whereas Amsterdam insisted on making the examinations compulsory, Rotterdam wanted to keep them optional. In 1851 the government of the day, dominated by Liberals, therefore decided to leave the matter to the discretion of the local authorities. The state-sponsored facilities were abolished on December 1, 1856 ¹⁶. The arrangements made by the local authorities differed from

¹⁵ DAVIDS, *op. cit.* (1985), p. 177.

¹⁶ C. A. DAVIDS, *De zeevaarkunde en enkele maatschappelijke veranderingen in Nederland tussen 1850*

those formerly made by the state in two important respects. First of all, the examinations covered both seamanship and the art of navigation. Secondly, instead of solely consisting of scientists or naval officers, the examining boards were composed of shipowners, insurers and shipmasters as well as scientists and teachers of navigation. The new system was in fact better suited to the needs of the merchant service than the old. In both, examinations were optional. However, the impact of the new system made itself much more widely felt than that of the state-sponsored one, owing to the intervention of the largest freighter in the Netherlands, the NHM. The NHM made a move similar to that of the Admiralty in Britain – but not until *after* local examining boards had come into existence and the number of navigation schools had considerably expanded. In 1858 the Directors of the NHM stipulated “in the well-understood interest of shipowners and insurers” that on every vessel chartered by the company two or three mates (depending on the size of the ship) should be in possession of certificates of examination. This decision probably affected some 40% of the mates in the Dutch mercantile marine. It led to a boom in examinations as well as in enrolment at schools of navigation. From January 1868 onwards, the obligation was extended to include all mates on ships freighted by the NHM¹⁷.

Although the decision of the NHM in 1858 was brought about by the high number of shipwrecks in the preceding year, there was no anxiety concerning the competence of navigating officers comparable to that in Britain some ten or twenty years before. In fact, during the 1840s a shipwreck on the route to Asia was considered a rare event. In the course of deliberations in 1851 on the reform of examinations, the Rotterdam Chamber of Commerce took the position that state regulations, like those issued in Britain under the Mercantile Marine Act, were simply not necessary in the Netherlands in view of the “very satisfactory” condition of the Dutch merchant fleet¹⁸. On the other hand, a number of shipmasters in Amsterdam and Rotterdam declared themselves in favour of examinations, provided these would cover both theoretical and practical subjects. The local initiatives concerning education and examinations discussed earlier actually corresponded with a growing tendency towards professionalism among navigating officers themselves¹⁹. This tendency found expression in the development of professional organizations, called *zeemanscolleges* (which literally means “seaman’s societies”, but can best be translated as “shipmasters societies” for reasons that will presently become clear).

en 1914, in: *Mededelingen van de Nederlandse Vereniging voor Zeegechiedenis*, 40/41, 1980, pp. 51-83, esp. pp. 59-60 and 74.

¹⁷ DAVIDS, *op. cit.* (1980), pp. 60-61.

¹⁸ MANSVELT, vol. 2, p. 149; Gemeentearchief Rotterdam (GAR), Archief Kamer van Koophandel, no. 44/18, minute letter to Minister (van Binnelandse Zaken), January 14, 1851.

¹⁹ GAR, Archief Kamer van Koophandel, no. 44/17, petition shipmasters and former shipmasters to Kamer van Koophandel, January 7, 1851; Gemeentearchief Amsterdam (GAA), P.A. 491, Archief College Zeemanshoop, no. 22, f. 305; Archief Kamer van Koophandel Amsterdam, ingekomen stukken 1846, B 47, May 22, 1846.

Apart from the "Blaauwe Vlag" — founded in Amsterdam in 1795 and dissolved in 1841²⁰ — all *zeemanscolleges* were established after the end of the Napoleonic Wars. In January 1817, the "Maatschappij tot Nut der Zeevaart" was founded in the maritime community of Veendam in the province of Groningen. The port-city of Dordrecht saw the formation of the society "Tot Nut van Handel en Zeevaart" on October 17, 1818. Rotterdam followed with the "Maatschappij tot Nut der Zeevaart" in 1819 and Amsterdam with the "Collegie Zeemanshoop" in 1822. In the province of Groningen other *zeemanscolleges* were founded in Pekel-A (1823), Sappemeer (1827), the city of Groningen ("De Groninger Eendracht", 1830), Delfzijl (1831), Wildervank (1839) and another in Pekel-A (1851). The first one in Friesland, "Zeemansvoorzorg" in Harlingen, was established in 1851. *Zeemanscolleges* also appeared in Vlaardingen (near Rotterdam) in the 1850s, on the isles of Schiermonnikoog and Ameland (about 1860 and 1878 respectively), and in the port-city of Den Helder in North-Holland (about 1881)²¹.

These voluntary associations served several purposes. First of all, they acted as friendly societies, just like the *Schiffergesellschaften* in German ports which dated back to the late Middle Ages and took a new lease of life in the 19th century²². The emergence of the *zeemanscolleges* is usually explained by the fact that seamen were excluded from the life insurance companies founded in the late 18th century²³. Each *zeemanscollege* established a fund aimed at paying benefits to widows and children of deceased members, or to members living in straitened circumstances due to old age, accident or illness. Some of them also provided a fixed payment for shipmasters in case of shipwreck; this arrangement was not uncommon with *zeemanscolleges* in the province of Groningen, where masters were usually shipowners as well²⁴. At first, funds were built up solely from contributions received from "effective" or "ordinary" members. As a rule this category consisted only of shipmasters; mates or common sailors were seldom admitted. Later the resources of the societies were enlarged by donations from "honorary" or "extraordinary", viz. non-seafaring, members. In some cases, an additional fund was formed to pay benefits to seamen below the rank of shipmaster or to their widows and children.

Secondly, the *zeemanscolleges* supplied useful intelligence to shipowners and other interested parties in the shipping industry. Each society had its own distinctive

²⁰ A. J. VAN DEN HOEK OSTENDE, *De geschiedenis van het College Zeemanshoop 1822-1972*, Amsterdam, 1972, p. 7; *Amsterdamsche Almanak voor Koophandel en Zeevaart*, 1830-1842.

²¹ VAN DEN HOEK OSTENDE, *op. cit.*, pp. 7-8; PETREJUS, *op. cit.*, pp. 99-100; J. SWART, *Zeemanscollegiën in Nederland 1^o Januarij 1850*, in: *Verhandelingen en berigten betreffende het zeezezen en de zeevaarkunde*, 10, 1850, pp. 12-23; ID., *Werkzaamheden en verrigtingen van de zeemanscollegiën in Nederland*, in: *ibid.*, 19, 1859, p. 303.

²² L. U. SCHOLL, *100 Jahre See-Berufsgenossenschaft*, in: K. P. KIEDEL, U. SCHNALL & L. U. SCHOLL (eds.), *Arbeitsplatz Schiff. 100 Jahre Seeberufsgenossenschaft 1887-1987*, Bremerhaven, 1987, pp. 10-40, esp. pp. 12-13.

²³ VAN DEN HOEK OSTENDE, *op. cit.*, p. 7; PETREJUS, *op. cit.*, p. 99; BROEZE, *op. cit.* (1978), p. 137.

²⁴ SWART, *op. cit.* (1850); PETREJUS, *op. cit.*, pp. 101-104; F. J. A. BROEZE, *Rederij*, in: *MGN*, vol. 3, pp. 92-141 (BROEZE, 1977), esp. p. 113.

flag and each "effective" members was given a special number to be shown on the flag. Every ship commanded by a member of a *zeemanscollege* could thus easily be identified at sea, even it could not be spoken. Whenever they dropped into port, shipmasters informed the board of their *zeemanscollege* of the ships sighted en route (as well as the dates and positions), such information subsequently being passed on to the newspapers or, with regard to foreign ships, to the respective consuls²⁵.

In the third place, the *zeemanscolleges* promoted the advancement of seafaring. To start with, they exhorted their members to communicate any observations deemed to be useful for other seafarers and entered into regular relations among themselves²⁶. Many societies also encouraged the development of professional knowledge. In the clubhouse opened by the association in Rotterdam in 1846, for example, members could consult not only newspapers and journals on shipping and commerce, but charts and publications on the art of navigation as well. The "Collegie Zeemanshoop" in Amsterdam established a library for the purpose²⁷. In 1829, this *zeemanscollege* also appointed a lecturer to instruct sons and pupils of members in mathematics and the art of navigation. During the 1830s the society in Veendam twice asked the government for financial support in order to establish a similar facility. The "Groninger Eendracht" in 1854 decided to subsidize the local school of navigation²⁸.

Efforts to advance professionalism reached their peak in the middle of the fifties, a time when the majority of shipmasters belonged to a *zeemanscollege*. Both the "Collegie Zeemanshoop" and the "Maatschappij tot Nut der Zeevaart" in Rotterdam – the largest in the country – became involved in the gathering of data for scientific research, which in turn enhanced the professional performance of navigators. As a consequence of the international meteorological conference at Brussels in 1853 and the subsequent lectures by the American naval officer Matthew Maury in Amsterdam and Rotterdam, the "Collegie Zeemanshoop" installed a committee on wind and current charts (later rechristened "committee for scientific seafaring" to indicate the enlarged scope of its activities), while the *zeemanscollege* in Rotterdam began to participate in the "committee for the advancement of the study of oceanic phenomena", established in 1854; this committee also included representatives from the scientific community, the shipowners as well as from the rest of the local elite²⁹. Both

²⁵ *Reglement voor de Maatschappij tot Nut der Zeevaart opgericht binnen Rotterdam, 1823*², pp. 14-15; 1827³, pp. 16-17; W. VAN HOUTEN, *De scheepvaart, of eene duidelijke voorstelling van zaken, die daarop betrekking hebben*, Breda, 1833, pp. 510-511.

²⁶ SWART, *op. cit.* (1850) and (1859); *Amsterdamsche Almanak voor Koophandel en Zeevaart, 1830* and subsequent years.

²⁷ *Reglement voor de Maatschappij tot Nut der Zeevaart ... Rotterdam, Reglement van orde voor de Sociëteit tot Nut der Zeevaart*, art. 5; VAN DEN HOEK OSTENDE, *op. cit.*, pp. 45 and 52.

²⁸ DAVIDS, *op. cit.* (1985), pp. 174 and 178-179; *Zeemanscollege De Groninger Eendracht. Gedenkboek 1830-1930*, Groningen, 1930, p. 37.

²⁹ *Koninklijk Nederlandsch Meteorologisch Instituut 1854-1954*, Den Haag, 1954, pp. 203-208; VAN DEN HOEK OSTENDE, *op. cit.*, p. 52; *Overzicht van het vijf en dertig jarig bestaan van de vereeniging ter bevordering van het onderzoek naar de verschijnselen op den oceaan te Rotterdam*, Rotterdam, 1889, pp. 3-5; C. A. DAVIDS, *Van vrijheid naar dwang. Over de relatie tussen wetenschap en zeezezen in*

committees promoted the collection of data on winds and currents in the Atlantic and Indian Ocean by issuing standard meteorological logbooks to shipmasters before the start of their voyage and, having collected them on return, sending them to the meteorological institute, the KNMI. In exchange for their co-operation, shipmasters received copies of the charts on winds and currents prepared by Maury as well as sailing directions and other publications issued by the KNMI on the basis of the data assembled by the seafarers themselves³⁰.

Gathering data in accordance with the standards set by the KNMI and the Rotterdam committee called for considerable professional competence. Shipmasters who wished to participate were requested to take with them a sextant, a chronometer, an azimuth compass, a barometer and a thermometer, all of which had to be checked by experts before they left port³¹. In early 1854 already more than a hundred masters had enrolled in the programme. By 1860 their number had risen to about 250 and seven years later to 336³², many of whom quickly switched over to the new route recommended by the KNMI as a result of the scientific analysis made of the collected data. In 1867, captain W. van der Hoeven pointed out that the duration of the voyage from the English Channel to the Sunda Straits had on average (i.e. voyages along the old and new routes taken together) been reduced from 103 days in 1845-55 to 98 in 1855-65. A shift to the new route led to a gain of about ten to twelve days³³.

Although the "effective" membership of *zeemanscolleges* was restricted to shipmasters, there is no doubt that the rise of professionalism extended to mates as well. Masters were usually recruited from the ranks of mates; indeed, anyone who had risen to the position of mate could expect that one day he would be in command himself, the more so as the number of ships steadily grew until the late 1850s³⁴. In the celebrated manual *Praktikale zeevaarkunde en theoretische kennis voor handel en scheepvaart* by Pieter le Comte published in 1842, which synthesized the bulk of the professional lore of the shipping industry, it was stated that "in spite of the difference in rank between master and mate, their duties in the operation of the ship are alike; a mate has to the same degree to be conversant with seamanship and the art of navigation as a master"³⁵.

Nederland in de 19de en vroege 20ste eeuw, in: *Tijdschrift voor de geschiedenis der geneeskunde, natuurwetenschappen, wiskunde en techniek*, 13 (1990), pp. 5-22, esp. pp. 9-10.

³⁰ See the literature quoted in note 29 and *Reglement voor de Commissie ter bevordering van het onderzoek naar de verschijnselen op den oceaan te Rotterdam*, Rotterdam, 1854, art. 27, p. 31.

³¹ *Reglement voor de Commissie*, art. 32.

³² *Koninklijk Nederlandsch Meteorologisch Instituut 1854-1954*, pp. 206-206; DAVIDS, *op. cit.* (1990).

³³ W. VAN DER HOEVEN, *Voorlezing gehouden op de openbare vergadering der Commissie ter bevordering van het onderzoek naar de verschijnselen op den oceaan*, Rotterdam, 1867, pp. 9-12 and 23; DAVIDS, *op. cit.* (1990).

³⁴ Cf. BROEZE, *op. cit.* (1978), p. 135 and P. J. VAN HERWERDEN, *De Groninger zeevaart in de tweede helft der 19e eeuw*, Arnhem, 1969², p. 119, on a "stuurmanscollege" (mates' society), which was modelled on the *zeemanscollege* and aimed at preparing mates for the position of master.

³⁵ P. LE COMTE, *Praktikale zeevaarkunde en theoretische kennis voor handel en scheepvaart*, Amsterdam, 1842, p. 188.

The level of professionalism attained in the early 1860s should of course not be exaggerated. Captains who showed an interest in "scientific seafaring" under the aegis of the KNMI constituted only a minority among the total number of shipmasters, even if they probably accounted for some 40 to 45% of those who regularly sailed to the East. After all, the NHM's rota system did not put a premium on fast crossings. On the other hand, the Parliamentary Committee inquiring into the condition of the Dutch merchant fleet in 1874-75 found no fault with the professional skill, properly speaking, of Dutch shipmasters, although it considered them to be somewhat short of general education and, in particular, commercial expertise. Dutch masters and mates surely received a better press from their MP's than their British colleagues had done from the Select Committee on Shipwrecks forty years before³⁶.

How is the growth of professionalism in the Dutch merchant service to be explained? In part, it was probably related to previous developments within the VOC and the Navy. As the East India trade was opened up to the world of shipping at large, the standards of professional skill that had already been attained by navigators of the VOC were adopted by ever greater numbers of masters and mates serving on ships that sailed to the East; to some extent, the diffusion process was already at work before the end of the 18th century³⁷. Professionalization in the Navy had its impact, too. Up to the 1830s, it was not unusual for naval officers to serve for a time as shipmasters in the merchant service. They accounted for some 10% of the 240-odd subscribers to Le Comte's manual. Moreover, they played a key role in the relations between the KNMI and the mercantile marine³⁸. But the rise of professionalism was not restricted to masters and mates who took part in the East India trade; members of *zeemanscolleges* in the province of Groningen, for instance, specialized in European or Atlantic navigation. The influence of naval officers cannot have been decisive here either. They were, after all, only a minority among the navigating officers in the merchant service.

There is yet another factor that promoted professionalism: support from local elites. Local elites sponsored the setting up of schools of navigation, gave financial aid to existing ones, appointed teachers well versed in the art of navigation at primary schools, instituted (and partly manned) local examining boards and, in Rotterdam, supported the "committee for the advancement of the study of oceanic phenomena". Shipowners in the ocean-going trade also supplied their navigating officers with chronometers and sometimes sextants as well (in addition to the customary com-

³⁶ *Enquête omtrent den toestand der Nederlandsche koopvaardijvloot* (gedrukte stukken Tweede Kamer zitting 1874/75), verslag der commissie, pp. 7 and 13; cf. COURSE, *op. cit.*, pp. 201-202.

³⁷ C. A. DAVIDS, *Het navigatieonderwijs aan personeel van de VOC*, in: *De VOC in de kaart gekeken. Cartografie en navigatie van de Verenigde Oostindische Compagnie 1602-1799*, Den Haag, 1988, pp. 65-74, esp. pp. 70-74.

³⁸ BROEZE, *op. cit.* (1978), p. 124; LE COMTE, *Naamlijst der intekenaren; Koninklijk Nederlandsch Meteorologisch Instituut*, pp. 48 and 203-207.

passes, logs, hourglasses and sounding leads)³⁹. Moreover, the propertied and educated classes – shipowners included – supported the *zeemanscolleges* by making contributions as “honorary” or “extraordinary” members⁴⁰.

In fact, by sponsoring the professionalism of navigating officers in the merchant service local elites were, in a sense, supporting themselves. The position of shipmaster was considered a very respectable one indeed. Shipmasters were the shipowners’ trusted agents, a relationship that could last for years, even decades. Masters were the only members of the crew who made an individual contract with the shipowners, and at sea and in foreign ports it was they who looked after the interests of the ship’s owner⁴¹. Furthermore, many shipmasters were shareholders themselves. Between about 1820 and 1850 earnings in the East-Indies trade were so high that they allowed masters to amass a considerable fortune, adopt a fashionable lifestyle and even go into business themselves⁴². The position of shipmaster in the merchant service, then, held many attractions both for those who wished to improve their status and for those born and bred in the propertied or educated classes. As these groups made the most of the career opportunities offered by a growing merchant service, it was not unnatural that the interest in the advancement of knowledge and the tendency towards professional organization that had already characterized the propertied and educated classes for some time⁴³ should be transferred to the profession of navigating officer.

3. The shift towards controlled professionalism, 1860-1914

By 1860, the growth of the Dutch mercantile marine came to an end. The merchant service entered a crisis, which was to last for several decades. The number of ships fell sharply – from 2,319 sail in 1860 to 634 in 1885, while the number of steamships rose from 42 to only 106 – as did the total capacity of the fleet. While the total number of masters and mates employed on sailing vessels reached about 5,000 in 1860, there were only some 1,300 positions left a quarter of a century later. In steam navigation, meanwhile, the number of jobs for navigating officers rose from about 170 in 1860 to some 400 in 1885⁴⁴. The total number of seafarers sitting an

³⁹ DAVIDS, *op. cit.* (1980), p. 57.

⁴⁰ SWART, *op. cit.* (1850), esp. pp. 16 and 18-19; *Amsterdamsche Almanak voor Koophandel en Zeevaart*, 1835, p. 147.

⁴¹ BROEZE, *op. cit.* (1978), pp. 125-130 and 133-135; ID, *op. cit.* (1977), pp. 113 and 118; J. R. BRUIJN & E. S. VAN EYCK VAN HESLINGA, *Maarten Schaap, een Katwijker ter koopvaardij (1782-1870)*, Amsterdam, 1988, pp. 23-41.

⁴² BROEZE, *op. cit.* (1978), pp. 133-135; ID, *op. cit.* (1977), p. 118.

⁴³ BROEZE, *op. cit.* (1978), pp. 133-134; ID, *op. cit.* (1977), p. 113; (H.W. TYDEMAN), *Zeemansleven en zeemansregt*, 2 vols., Amsterdam, 1855, vol. 1, p. 68; *De Zee*, 4, 1882, p. 290; F. W. DETHMAR, *Freundliche Erinnerung an Holland und seine Bewohner*, 4 vols., Essen/Rotterdam, 1838-1841, vol. 3, p. 31; P. R. D. STOKVIS, *Nederlandse sociale verhoudingen tegen 1850*, in: *Tijdschrift voor Sociale Geschiedenis*, 4, 1978, pp. 70-86, esp. pp. 80-81; W. W. MIJNHARDT, *Tot Heil van 't Menschdom'. Culturele genootschappen in Nederland, 1750-1815*, Amsterdam, 1988, ch. III and VI.

⁴⁴ DAVIDS, *op. cit.* (1980), p. 70, and see the calculation in the petition to the Minister van Waterstaat, Handel en Nijverheid in *De Zee*, pp. 339-350.

examination dropped from about 400 a year in the early sixties to less than 100 in the early eighties⁴⁵.

The causes of the crisis – which led to the Parliamentary inquiry of 1874-75 – will be left to one side. Suffice it to say that, besides the general slump on the freight market from 1857 on, there were also factors at work that were peculiar to the Netherlands. One of these was the dismantlement of protectionism in the East-Indies trade, owing to the rising power of Liberalism in Dutch politics. In 1868, the NHM's rota system of freighting was replaced by a tender system. From 1870 onwards, the task of hiring of ships for return freights was left completely to the company's office in the East. In the freight market for government produce, Dutch shipowners henceforth had to contend with sharp competition both from foreigners and from fellow countrymen. But the shipping of government produce also diminished, as the Culture System was abolished after 1870. Even so, the East-Indies trade continued to be of great importance to the Dutch shipping industry as a whole. In 1919, 46% of the tonnage of the Dutch merchant service (or even 57% of the tonnage used in scheduled services) was employed in the trade to and from the Indies or in the Indian Archipelago itself⁴⁶. It should be added that protectionism to some extent revived in 1891, as the packet trade in the Indies was commissioned to the "Koninklijke Paketvaart Maatschappij", which had close links with the main Dutch shipping companies, colonial interest groups as well as with the Dutch state⁴⁷.

While the shipping industry was being subjected to this lengthy crisis, it also underwent drastic reorganization. Wooden ships were replaced by iron or steel ones, while an ever-increasing proportion of the merchant fleet capacity came to consist of steamships instead of sailing vessels. Before World War I, the shift had by and large been completed. The point at issue here is the impact of this structural change on the professionalism of Dutch navigating officers against the background of the prolonged crisis in the shipping industry. Let us take another look at three aspects : professional training, tests of competence and professional organizations.

As for training facilities, during the sixties and seventies their number was considerably reduced. Private teachers became almost extinct ; in Amsterdam, for instance, only two out of seven were still active by the middle of the seventies. Schools of navigation saw their enrolment figures dramatically decline. Many of them even closed. By 1875 no more than 11 were left. However, state support for nautical education rapidly increased from about 1890 onwards. During the nineties, the total amount of state subsidies for local schools of navigation increased tenfold and between 1900 and 1910 it again doubled. The content of the courses was considerably

⁴⁵ DAVIDS, *op. cit.* (1980), pp. 60 and 63-64 ; *Id.*, *op. cit.* (1985), p. 177.

⁴⁶ MANSVELT, *op. cit.*, vol. 2, pp. 302-312 and 328-329 ; A. FLIERMAN, 'Het centrale punt in de reederswereld'. *De Koninklijke Nederlandse Redersvereniging 1905-1980*, Bussum, 1984, p. 31.

⁴⁷ J. À CAMPO, *Wereldsysteem in bedrijf ; scheepvaartconcurrentie in Indonesië 1891-1914*, in : *Jaarboek voor de Geschiedenis van Bedrijf en Techniek*, 3, 1986, pp. 252-269, esp. pp. 254-255.

extended and improved, and the average number of teachers at each institution rose from 3.3 in 1888 to 9.2 in 1910⁴⁸.

As for tests of competence, the year 1877 saw the re-establishment of state facilities for optional examinations of mates, the local examining boards being replaced by a committee appointed by the government. In 1904, examinations for mates on merchantmen over 100 tons were finally made compulsory; masters were required to possess a certificate of first mate. Three years later, the regulation was extended to the rest of the Dutch mercantile marine⁴⁹.

For most of the old professional organizations for shipmasters, the *zeemanscolleges*, developments in the shipping industry after 1860 spelt ruin. The decline can be read from graph 1. "Effective" membership figures went down everywhere, although the decrease was more rapid in the port-cities in Holland than in the maritime communities in the northern provinces, where the full impact of the shift from wood to iron and from sail to steam was felt more slowly. Many societies were liquidated: Den Helder ca. 1895, Sappemeer ca. 1897, Oude Pekel-A ca. 1900, Veendam ca. 1901, Delfzijl ca. 1914, Dordrecht and Rotterdam in 1919. Of the six remaining in 1920, only two ("Collegie Zeemanshoop" and the "Groninger Eendracht") survived the slump in the thirties⁵⁰.

On the other hand, in addition to the *zeemanscolleges* new organizations came into being. The first was the "Vereeniging voor de Zeevaart", founded in Rotterdam in January 1897. Membership was open to shipmasters, former shipmasters and first mates as well as other persons who would support the aims of the "Vereeniging" (to a maximum of one-sixth of the total membership). In December 1897 the number of members stood at 79, in October 1900 at 170. By early 1921 it had risen to 216, 147 (68%) of whom lived in Rotterdam. About 90% of them also belonged to the "Gezagvoerdersclub", a social club established in 1917 by members of the "Vereeniging" that was open only to shipmasters. The "Vereeniging" aimed at promoting the interests of both seafarers and seafaring. It was formed as a direct result of the imminent introduction of a bill on compulsory examinations for mates. The "Vereeniging" pronounced itself in favour of increasing the number of qualified mates required for ships of various sizes in the mercantile marine⁵¹.

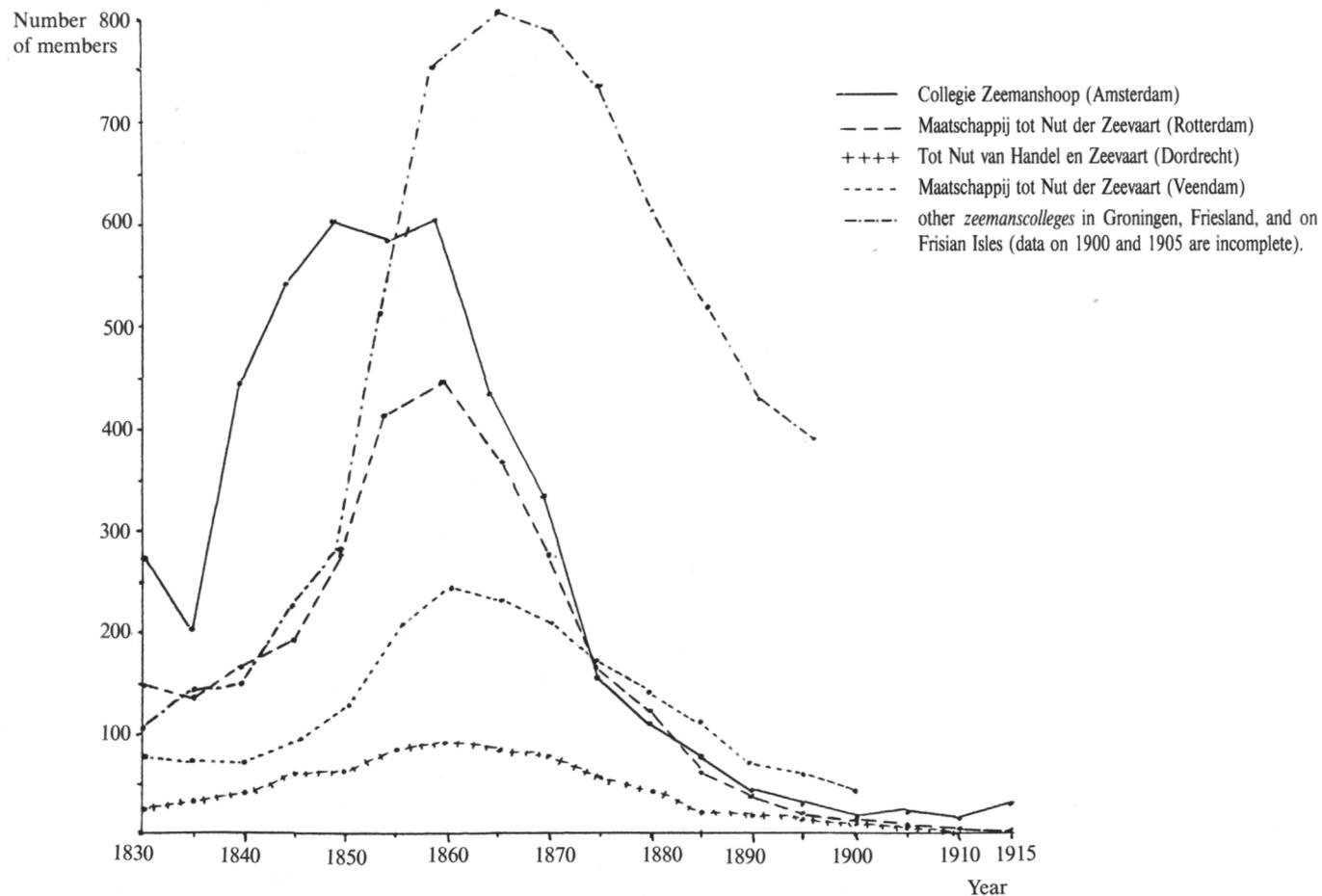
Another voluntary association was founded by thirty mates in Amsterdam in February 1901. At first, its membership was formally restricted to mates and former

⁴⁸ DAVIDS, *op. cit.* (1980), pp. 62-64; ID., *op. cit.* (1985), p. 173; A. FLIERMAN, 'Met de vereischte bezadigdheid'. *De bestuurlijke reorganisatie van het zeevaaronderwijs, 1870-1935*, in: *Tijdschrift voor Zeegechiedenis*, 4, 1985, pp. 191-204.

⁴⁹ DAVIDS, *op. cit.* (1980), p. 62.

⁵⁰ The dates of liquidation have been derived from the *Amsterdamsche Almanak voor Koophandel en Zeevaart*; see also PETREJUS, *op. cit.*, p. 104.

⁵¹ *De Zee*, 19, 1897, pp. 172-173; 20, 1898, pp. 56 and 184-186; 20, 1899, p. 115; 21, 1900, p. 483; *De Zeevaarder*, 2, 1921, nr. 3, pp. 5-12; nr. 4, pp. 1-3; C. GOSLINGA & S. J. VAN LIMBURG STIRUM, *Gedenkboek der Vereeniging van Nederlandsche Gezagvoerders en Stuurlieden ter Koopvaardgij*, Amsterdam/Rotterdam, 1926, pp. 21-22 and 27-28.

Graph 1. — Effective membership of *zeemanscolleges* (1830-1915).Source : *Amsterdamsche Almanak voor Koophandel en Zeevaart*, 1830-1915.

masters. From 1906 onwards, active masters were admitted as well, and the association was renamed the "Vereeniging van Nederlandsche Gezagvoerders en Stuurlieden ter Koopvaardij" (VNGSK) accordingly⁵². The bulk of the membership continued to be recruited from the ranks of mates, however. In 1910, for example, they accounted for 82% of the 853 members. At about the same time, the organization managed to broaden its base in a geographical sense, as the mates in Amsterdam were joined by increasing numbers of their colleagues in Rotterdam. The growth went apace until the early twenties. In 1922 the membership peaked at 3,065⁵³. This "Vereeniging" aimed primarily at defending the interests of Dutch navigating officers vis-à-vis other groups : foreigners, shipowners and the lower ranks on board. Apart from insisting on compulsory examinations for mates, it campaigned against the employment of unqualified foreigners, called for better regulations on discipline aboard and pressed for the improvement of living conditions (including the safety of the ship)⁵⁴.

By the end of the First World War, the vast majority of masters and mates in the Dutch merchant service belonged either to the "Vereeniging van Nederlandsche Gezagvoerders en Stuurlieden ter Koopvaardij" or to the "Vereeniging voor de Zeevaart", or to both. The old type of professional organization had thus been superseded by a new one that united masters and mates, behaved more like a trade union and was more prepared to put pressure on the government.

The changes affecting the three aspects of professionalism can indeed be explained by the technological developments in the mercantile marine discussed earlier. But the relationship was not a *direct* one.

The professional competence acquired by masters and mates in the age of sail was by no means made expendable by the rise of steam navigation. True, the store of data on winds and currents in the South Atlantic and the southern Indian Ocean, to which Dutch masters had so eagerly contributed in the fifties and early sixties, became increasingly redundant, as steamers en route to and from the Indies switched over to the Suez Canal and the northern Indian Ocean instead. The lore on sails, rigging and manœuvring with sailing vessels was not as indispensable as it had been in the past. However, navigating officers on steamships had a stake in continuing to gather data on winds and currents as well, because they saw themselves amply rewarded by the supply of sailing directions for relatively unknown waters from the KNMI. Neither could they completely dispense with the knowledge on sails, rigging and manœuvring of sailing vessels. Many steamers were still carrying sails – until about 1900, at least – and any navigating officer had to take the movements of other ships into account when manœuvring his own⁵⁵.

⁵² GOSLINGA & VAN LIMBURG STIRUM, *op. cit.*, pp. 21, 40, 42.

⁵³ GOSLINGA & VAN LIMBURG STIRUM, *op. cit.*, pp. 50, 95.

⁵⁴ GOSLINGA & VAN LIMBURG STIRUM, *op. cit.*, pp. 21-31 and 50-51.

⁵⁵ *Overzicht van het vijf en dertig jarig bestaan*, p. 10 ; *Koninklijk Nederlandsch Meteorologisch Instituut*, pp. 219-220.

The examination regulations from the late 1850s down to the First World War show the requirements for masters and mates in steam navigation and sail navigation to be essentially identical. Separate examinations for the two branches of shipping were not introduced until 1886 and, even then, the contents of the regulations remained largely the same. Distinctions between examinations for the ocean-going and the home trade, or for the different ranks of mates, were far more substantial⁵⁶. According to the examination regulations issued by local authorities in the 1850s or by the national government from 1877 onwards (optional until 1904), navigating officers could be examined on almost the same subjects, regardless of whether they aspired to a career on steamships or sailing vessels⁵⁷.

With respect to the art of navigation and its auxiliary sciences of mathematics, geography and meteorology, the range of subjects was exactly alike for both branches of shipping, both before and after 1886. That stands to reason, as the introduction of steam did not herald any major innovation in the art of navigation. True, the problem of observing the deviation of and adjusting the compass became an increasingly pressing one in the age of steam as ever more steamships were made of iron or steel instead of wood. Great-circle sailing perhaps turned into a more practical proposition than in the age of sail as steamship routes were less dependent on the prevailing winds than those of sailing vessels. But it will be recalled that the use of iron was by no means restricted to the construction of steamships. Research on deviation was already an expanding field of study in the 1840s and 1850s, when steam navigation in the Netherlands was still in its infancy⁵⁸. The subject was incorporated into local examination regulations about 1855. Great-circle sailing was, under certain conditions, practicable for sailing vessels, too.

The main difference in the professional requirements for navigating officers in steam and sail navigation lay, not surprisingly, in the topic of constructing and operating the steam engine. This first appeared as a distinct subject in the local regulations of Amsterdam and Rotterdam in 1858. But that particular difference was not insuperable. Anyone who wished to change from a post on a sailing vessel to one on a steamship, or vice versa, could sit a complementary examination. Facilities for such tests were created in Amsterdam and Rotterdam by the local regulations on examinations and later instituted in national regulations as well. It is probable that the construction and working of the steam engine was taught both at the school of navigation in Rotterdam and the one at the "Zeemanshuis" in Amsterdam from the

⁵⁶ *Staatsblad*, 1886, no. 10, p. 12; 1891, no. 106, p. 11; 1907, no. 353, pp. 14-15.

⁵⁷ Local and national regulations on examinations can be found in: J. SWART, *Over het examen voor gezagvoerders en stuurlieden*, in: *Verhandelingen en berigten betrekkelijk het zeewezen en de zeevaartkunde*, 15, 1855, pp. 393-407; GAR, *Archief Inrigting tot het examineren van varenslieden*, no. 10; GAA, P.A. 321, no. 23; *Staatsblad van het Koninkrijk der Nederlanden*, 1877, no. 98; 1886, no. 10; 1891, no. 106; 1907, no. 353.

⁵⁸ DAVIDS, *op. cit.* (1980), p. 53; Ch. A. COCHERET, *De Rotterdamsche zeevaartschool 1833-1933*, Rotterdam, 1933; F. J. STAMKART, *De regeling van kompassen aan boord van ijzeren en stalen schepen*, Amsterdam, 1861.

1860s onwards, although special instructors in the subject were not appointed until 1888 and 1894 respectively. Other schools of navigation introduced similar provisions about 1890. At the "Kweekschool voor de Zeevaart" (which as open only to those with no previous experience at sea) courses on steam were included in the curriculum in 1860, and in 1884 the first special instructor in the subject was added to the staff⁵⁹.

When it came to practical experience, the barriers to a transfer between the two branches of shipping were not insurmountable either. According to the regulations of 1877 and later, examinees for the rank of third, second or first mate were required to have at least one year's experience at sea. However, it sufficed for candidates for the rank of second or first mate on a steamer to have passed half the period in steam navigation, and for those who applied for the same rank on a sailing vessel to have passed half the period on sailing ships⁶⁰. Indeed, there were substantial numbers of seafarers who sat for complementary examinations in order to qualify for both branches of shipping. The examining board in Rotterdam saw its number of "steam" examinations peak in the early seventies. There was another boom in the nineties, this time at a national level, as is shown in graph 2⁶¹.

The relationships between changes in professionalism and technological change in the mercantile marine thus was not a *direct* but an *indirect* one. As the merchant service changed over from sail to steam, the structure of ownership and the pattern of labour relations were modified, too. The limited liability company succeeded the traditional one-ship company, with shareholders (*partenrederij*) as the dominant form of business organization. Shipmasters were no longer co-owners of the ship they commanded⁶². Instead of being the trusted partner or even the social equals of the shipowners, they turned into mere employees of the company, even if their status remained somewhat higher than that of the rest of the workforce. Shipmasters in the service of steamship companies thus found themselves in a position similar to that of their predecessors in the service of the VOC.

The management of steamship companies, for their part, chose to rely on clear guarantees of quality rather than on the unpredictable outcome of the autonomous

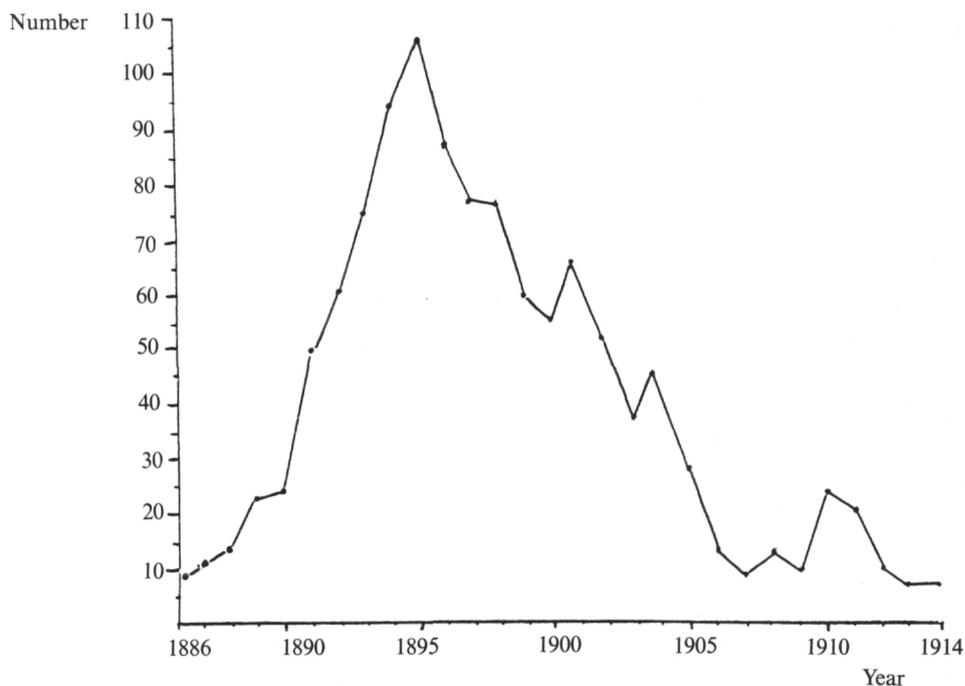
⁵⁹ H. Th. DE BOOY, *100 Jaar Zeemanshuis en zeevaartschool van het zeemanshuis*, s.l., pp. 23 and 26 ; COCHERET, *op. cit.*, pp. 34, 50 and 53 ; C. ROGGENKAMP, *Van school voor nijverheid en zeevaart tot Noorderkweekschool 'Abel Tasman' 1856-1956*, Delfzijl, 1956, p. 29 ; J. C. M. WARNSINCK, *De Kweekschool voor de Zeevaart en de stuurmanskunst 1785-1935*, Haarlem, 1935, pp. 241 and 277-278.

⁶⁰ *Staatsblad*, 1886, 6, no. 10, pp. 5-6 ; 1891, no. 106, pp. 3-5 ; 1907, no. 353, pp. 4-6. From 1879 onwards all examinees had to pass at least half the required time of service on a sailship. As the number of sailships rapidly declined, this regulation indeed raised a practical barrier for those aspiring *directly* to the position of mate on a steamship (instead of transferring from a sailship to a steamer). However, the barrier was lifted in 1886 when – at the insistence of interested parties in steam navigation – examinations for steamers were separated from those for sailing vessels, see *De Zee*, 5, 1883, pp. 339-350.

⁶¹ GAR, Archief Inrigting tot het examineren van varenslieden, no. 5 ; *Statistiek van de zeescheepvaart over het jaar 1898*, p. 31 ; 1900, p. 36 ; 1914, p. 54.

⁶² BROEZE, *op. cit.* (1977), pp. 118 and 137-141.

Graph 2. — Complementary examinations of mates for steam navigation (1886-1914).



Source: *Statistiek van de zeescheepvaar over het jaar 1898*, p. 31; 1900, p. 36; 1914, p. 54.

drive forwards professionalism. This holds true at least for firms operating scheduled liners, which comprised the bulk of the mercantile marine's capacity⁶³. In order to enhance the safety and predictability of their services, the companies promoted controlled rather than autonomous professionalism. It was perhaps no coincidence that quite a few of the prominent members on the boards were former naval officers⁶⁴. Among candidates for the positions of master or mate they usually preferred graduates of the "Kweekschool voor de Zeevaart", the education at the "Kweekschool" more closely resembling the training of naval officers than that offered by any other school of navigation.

Steamship companies also urged the improvement of nautical education in general, mainly extending "pre-sea" instruction courses. In the middle of the eighties, mail and passenger liners were almost exclusively staffed by certificated officers, even if examinations were still optional. Besides, the companies operating steamships from Amsterdam and Rotterdam — as against the tramp shipping firms and the small shipowners in Groningen — pressed for the introduction of compulsory examinations.

⁶³ FLIERMAN, *op. cit.* (1984), p. 31.

⁶⁴ DAVIDS, *op. cit.* (1980), p. 74.

To achieve this, directors of steamship companies co-operated with teachers at nautical schools, insurance experts and staff members of the KNMI and its departments established in Amsterdam and Rotterdam in the 1880s. Members of these groups joined the "Vereeniging ter bevordering van het zeevaarkundig onderwijs" (Association for the advancement of nautical education), founded in 1873⁶⁵. Their pressure was directed at the state. According to the managers of steamship companies and their allies, it was the government's duty to take, at long last, appropriate measures.

Owing to their efforts as well as to the gradual rise of state interventionism in general, the government finally proceeded to take a hand in the professionalism of navigating officers in the merchant service by subsidizing schools of navigation and making examinations compulsory.

Finally, we turn to the change in professional organizations. Although one of the old *zeemanscolleges*, "Collegie Zeemanshoop", included a number of steamship company captains among its "effective" members from the 1820s onwards, it never comprised more than a handful of the masters employed by steamship companies in Amsterdam. About 1860, only nine of the 600 "effective" members commanded a steamship. In the early eighties, the *zeemanscollege* enrolled twenty steamship masters, bringing their share of the membership to 30%⁶⁶. But in 1890 still no more than 10 of the 22 captains employed by the "Koninklijke Nederlandsche Stoomboot Maatschappij", 2 of the 5 employed by the "Koninklijke West-Indische Maildienst" and 5 of the 14 employed by the "Stoomvaartmaatschappij Nederland" were listed as members of the *zeemanscollege*. In 1895 the proportions were even lower: 5 to 25, 1 to 4 and 2 to 15 respectively⁶⁷. The "Maatschappij tot Nut der Zeevaart" in Rotterdam did not enlarge its "effective" membership at all, while the number of captains employed by steamship companies registered in the city grew steadily from the early 1870s onwards. Hardly any *zeemanscollege* decided to admit mates as "effective" members as well.

Were these traditional organizations becoming less attractive to masters in the service of steamship companies because the benefits they gave were being made redundant by the firms offering their own pension programmes, sick pay schemes and the like? True, some companies did so, but only as time went by. Moreover, the social security offered by the employers in the shipping industry was apparently not considered sufficient by the masters and mates organized in the VNGSK. In 1913 the association established its own widows' fund — just as the *zeemanscolleges* had done in the past! During the First World War, the society pressed for state regulations on accident benefits⁶⁸.

⁶⁵ Hoos, *op. cit.*, p. 28; DAVIDS, *op. cit.* (1980), pp. 63-64, 67-68 and 73-74.

⁶⁶ *Amsterdamsche Almanak voor Koophandel en Zeevaart*, 1826, 1827, 1860, 1883.

⁶⁷ *Amsterdamsche Almanak voor Koophandel en Zeevaart*, 1890 and 1895, "Voornaamste rederijen in Nederland".

⁶⁸ GOSLINGA & VAN LIMBURG STIRUM, *op. cit.*, pp. 63 and 71.

Why, then, did the *zeemanscolleges* not succeed in mobilizing the bulk of the steamship masters or in assuming the functions later performed by the "Vereeniging van Nederlandsche Gezagvoerders en Stuurlieden ter Koopvaardij"? Their failure may best be explained by the fact that, as the Dutch shipping industry was in a phase of crisis and reorganization, adaptation on the part of the associations was hampered by a divergence of interests between masters and mates as well as by a loss of outside support.

Masters of sailing vessels saw their position increasingly threatened. In the second half of the 19th century, their incomes steadily declined. Earnings of masters in the 1870s were definitely lower than in the 1840s – maybe by as much as 75% –, while the nominal wages of mates had remained more or less stable and those of sailors had risen by 50%. A career at sea lost its appeal for scions of the propertied and educated classes⁶⁹. The information lead over shipowners and other interested groups in the shipping industry that shipmasters once enjoyed outside their home port was undone by the rise of ship's agencies and the installation of overseas telegraph links⁷⁰. On top of all this, employment for masters on sailships declined, at first slowly, though more dramatically after 1870. Positions as master on a steamer were as yet hardly available; accordingly, some shipmasters chose to sign on as mate instead⁷¹. As the prospects for established masters grew bleaker, their interests diverged more clearly from those of mates, who saw their career opportunities blocked. It was not illogical that hardly any *zeemanscollege* extended its "effective" membership to include mates. The majority of mates who rose to the rank of captain in the service of a steamship company after about 1890 probably had no reason to join such an association as "effective members", because the benefits to be enjoyed became increasingly doubtful. The financial situation of the "Maatschappij tot Nut der Zeevaart" in Rotterdam, for example, was reported as "unfavorable" in 1896 and even "alarming" in 1901⁷². The loss of income due to the drop in "effective" membership from the 1860s on must have been aggravated (for most *zeemanscolleges* at least) by the decline of outside support. In Rotterdam, the number of "honorary" members fell from 780 in 1876 to 312 in 1901⁷³. Apparently, the societies were deserted by the local elites, too.

As steamship companies came to dominate the Dutch shipping industry and state regulations set their mark on the professionalism of navigating officers, so conditions

⁶⁹ BROEZE, *op. cit.* (1978), pp. 135-137; DAVIDS, *op. cit.* (1980), p. 70; TYDEMAN, *op. cit.*, vol. 1, pp. 68-69 and 78-83.

⁷⁰ BROEZE, *op. cit.* (1977), p. 118.

⁷¹ E. J. HOOS, *De ontwikkeling van de Nederlandsche koopvaardijvloot*, Amsterdam, 1911, p. 28.

⁷² *Verslag van den toestand der gemeente Rotterdam*, 1896, p. 479; 1901, p. 387. The society in Harlingen admitted mates as effective members from the start, see *Het college 'Zeemansvoorzorg' te Harlingen, 1851-1931*, Harlingen, 1931, pp. 4-5.

⁷³ *Verslag van den toestand der gemeente Rotterdam*, 1876, p. 297; 1901, p. 387 (honorary members for the flag excluded); the number of honorary members of "Zeemanshoop" fell from 1,750 to 861 between 1880 and 1899, see VAN DEN HOEK OSTENDE, *op. cit.*, p. 29

in the Dutch merchant service increasingly resembled those in Britain, and it was only to be expected that masters and mates would resort to a similar organizational response as their colleagues across the North Sea. Thus the federation of British shipmasters societies (established in 1890) got its counterpart in the "Vereeniging voor de Zeevaart", and "The Imperial Merchant Service Guild" (founded in 1893) in the "Vereeniging van Nederlandsche Gezagvoerders en Stuurlieden ter Koopvaardij"⁷⁴.

4. Conclusion

Professionalism among masters and mates in the Dutch merchant service was already well advanced before the shipping industry underwent the full impact of the technological changes connected with the Industrial Revolution between about 1860 and 1914. The rise of professionalism was facilitated, though not determined, by the introduction of protectionist policies after 1815 that boosted the growth of the mercantile marine. This was primarily due to efforts on the part of the navigating officers themselves, supported by shipowners and other members of local elites. This "self-help" movement found its highest expression in the activities of *zeemanscolleges*.

After about 1860, both the source and nature of professionalism were modified. Developments were more and more determined by the intervention of the state, stimulated by pressure from shipowners, teachers of navigation, insurance experts and scientists. Navigating officers adapted themselves to changing circumstances by realigning in new organizations geared to the protection of their interests vis-à-vis the employers and the government. The shift towards controlled professionalism was brought about indirectly by the impact of technological changes, although the ground was smoothed by the grave crisis that struck the Dutch mercantile marine after 1860.

⁷⁴ COURSE, *op. cit.*, p. 265.