Dutch Ships in Tropical Waters

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The development of the Dutch East India Company (VOC) shipping network in Asia 1595-1660

Robert Parthesius

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The people that we call the Red-haired or Red Barbarians are one and the same as the Hollanders and they live on the Western Ocean.

They are greedy and cunning, have ample knowledge of valuable goods, and are skilled at seeking their own advantage. For profit they do not even hesitate to jeopardise their own lives, and no place is too distant for them to try and reach it. [...]

Who meets them at sea, will certainly be robbed.

Thai-Wan Hoe Tsi (after Groeneveldt 1898)

Foreword

'How to create a monster and how to get it back in its cage' seems to be an appropriate motto for this research project of mine. Not because the research and the work itself turned out to be monstrous but because my own ambitions and the ensuing consequences went out of hand. What started with the idea of reconstructing the shipping history of some VOC ships in the 17th century gradually evolved into a systematic study on the whole VOC fleet and their shipping activities in Asia until 1660. I had initially hoped for my research to just shed light on an underexposed aspect of the Dutch and Asian maritime history, but found wrestling with the ever growing database of VOC ships in service and the voyages they made. Meant to support me in the analyses of the development of the shipping network in Asia it turned out to be a project and a creature in itself. To date it contains more than 30.000 records of voyages to about 700 individual destinations. Of these, 11.700 voyages between 520 destinations in 35 Asian areas are relevant to this study.

Of course, this monster was created voluntarily and primarily nourished by my curiosity to find out more about the maritime context the VOC ships were operating in. This interest was sparked already in the 1980's during my research work for the Batavia-project, in first The Netherlands for the 'replica' building in Lelystad, and later also in Australia for the Western Australian Maritime Museum. Since then I have been privileged to be part of various other projects centred around the activities of VOC in Asian waters of which the Avondster project in Sri Lanka was the highlight.

I feel privileged not only because I was able to work on exiting projects but above all, because it brought me in contact with wonderful colleagues many of which have become friends. Here, I would really like to pay tribute to the team members of the various projects I worked on. Together with the support of other friends and colleagues from the Western Australian Maritime Museum and the Amsterdam Historical Museum the writing of this publication became an academic adventure rather than the synonym more often used: the lonesome quest.

With so many people supporting my work it is difficult to single out some of them with a special acknowledgement. Still, there are a few that played a special role in the conception of this research. First of all, the people that inspired me to start this intellectual journey by stimulating me to look always for a new question behind an answer: Jeremy Green, Bas Kist and of course my supervisor Leo Noordegraaf. Then, the people who stimulated me to carry on and made it possible to fulfil this task: Isabelle Garachon, Camille Parthesius, Romain Parthesius. The support I received in that respect from Pauline Kruseman, director of the Amsterdam Historical Museum, was essential and heart warming. Special thanks to Menno Leenstra who became the driving force behind the establishment of the database by continuously collecting 'trips and ships' and whose comments and advice were of invaluable importance to me. *Het Centrum voor de studie van de Gouden Eeuw,* on instigation of its director Henk van Nierop, supported me financially to complete the final stage of this research.

Then, there are those who just believed in this endeavour and therefore supported me immensely. There were many but four need to be singled out: Karen Millar, Albert van Nunen Karioen, Miranda Vos and Patricia Meehan. I also would like to thank Karina Acton, Christine van der Pijl-Ketel and Fred Lambert for reading the text and correcting 'my English'.

Although I enjoyed the whole process of this research tremendously, the real delight of the work laid in the tail end. During the last year, when the writing and deciding on the final draft

of a publication can get a bit complicated, Olive Schmidenberg crossed my path to inspire and assist me. Shoulder to shoulder we both walked the last miles of our two extraordinary journeys together. Olive had to give up her journey here in July 2006. Her pearls of wisdom and strength will go a long way. It is to this special friend: *Ying Wu, the Chinese plate-spinner* that I dedicate this work.Dutch Ships in Tropical Waters

1

Introduction

Dutch ships in Asian waters

From the 16th century European ships sailed to Asian markets on a regular basis. Their main goal was the purchase of the highly sought after spices from the East Indies and exotica from China. Traditional trade and shipping relations between the west and east existed long before European ships arrived in the Indian Ocean region. Before the Portuguese discovered the seaway around the Cape of Good Hope to Asia at the end of the 15th century, spices reached Europe over land. The Portuguese were the first Europeans to play an active role in trading directly with Asia by sea. From their headquarters at Goa on the west coast of India, they tried to get a grip on the traditional trading and shipping network by capturing the entrepot of Malacca, which had a strategic role in the Asian trading network between the Indian Ocean region and the Far East. Spain made its way into this region from their colonies in the Americas. The Spanish influence was in the region around the Philippines: China , Japan and the Spice Islands. At the end of the 16th century, other European nations also found their way to Asia.

Soon after the first expedition in 1595, the Dutch were able to surpass the Portuguese and the other European nations' trade in Asia. In various Dutch cities, trade companies were established to equip ships for their voyages to Asia. This new trade became popular because profit expectations were high, as a result of which large fleets of ships were sent to Asia. Until 1602, when the various companies were united under the *Verenigde Oostindische Compagnie* (VOC) or United East Indian Company, fourteen fleets were sent comprising 65 ships compared to a total of 59 ships that had been dispatched by the Portuguese in the period 1591-1601. Soon more then 50% of the European ships that passed the Cape of Good Hope on their way to Asia were Dutch (Gaastra 1993).

This development had a major impact on the growth of the Netherlands, although the economic contribution to the Golden Age in the 17th century should not be exaggerated, the logistical implications of the Dutch expansion into Asia were immense and very much evident in the VOC cities in the Netherlands. Efficient trade was not easy, since the products had to be collected from various parts of Asia, and the means of payment presented a problem. The European traders initially intended to base their trading activities on the available products in Europe, but they soon found out that there was only a small Asian market for these items. Large quantities of precious metal were required for the trade in Asia. In order to limit the complications and risks attendant upon the transport of money, the VOC soon started to develop its intra-Asian trade. The Dutch had to establish their position in the long-standing existing trade network in Asia. Especially during the early years, the position of the company was one of skilfully alternating between negotiations and the force of arms. That this policy was successful can be concluded from the fact that the VOC was able to build up a significant capital from its profits in Asia in the first half of the 17th century (Meilink-Roelofsz 1988, p. 444). In the second half of the 17th century the VOC reached the zenith of its intra-Asiatic trade (Gaastra 1989).

The search for the seaway to Asia was a logical step in the broad and successful tradition of Dutch shipping in Europe. In the 16th century, Dutch skippers and their ships held an eminent

position in the European shipping network. Their efficient assimilation into the changing circumstances in the European shipping trade is seen as the most important quality of the Dutch shipbuilders and skippers (Davids 1991, pp. 22-24; Unger 1978, pp. 41-68). In the course of the 16th century, the traditional sailing areas in northwest Europe were extended to the Atlantic coast, the Arctic seas, the Mediterranean and, later, also Africa and Brazil. These new destinations meant new sailing conditions and new types of trade and cargo, which in turn led to new requirements for ships and shipping organisation. New ship types were developed as a result of a general scaling-up in the second half of the 16th century. The most famous example of this development is the development of the flute, which was designed in the 1590s as a new type of ship for the developing European trade. It met the ideal combined requirements of both the merchant and the skipper, being cheap to build, easy to sail and having a large cargo capacity. Changes took place on many levels of the shipping and shipbuilding sectors. Most of these modifications were not as spectacular as the new flute design; however, the instigation of these changes was the reason for the success in shipping that the Dutch enjoyed in the 17th century (Wegener Sleeswijk 2003).

Sailing and trading in Asia were new for nearly all the Dutch merchants, skippers and sailors. Although some theoretical information had been gathered by spying on the Portuguese who had been sailing to Asia from the end of the 15th century, the practicalities had to be learned by trial and error.

Purpose of this study: 'The missing link'

This period in Dutch maritime history has been recognised for its importance and has been the subject of many publications over the years (Gaastra 2003, pp. 181-188). However, most of these accounts have dealt with the political and/or economic aspects of the early stages of the Dutch presence in Asia. The study 'VOC als zeemacht' by MacLeod (1927) contains a lot of information on the development of shipping in Asia until 1640. Although it was the preliminary goal of this author to describe the political/military implications of the Dutch expansion in Asia, exhaustive listings of departure and arrival dates to illustrate the movements of the VOC officials, offer an insight into the development of VOC shipping in Asia. This maritime aspect of the Dutch history in Asia is also known through the many published ship journals. *De Linschotenvereninging* in particular has been very active since 1908 in publishing journals on the voyages made by VOC ships and skippers. To date, the prevalent view of VOC shipping is based on the monumental volume 'Dutch-Asiatic Shipping' (DAS) by Bruijn, Gaastra and Schöffer (1979-1987). This work focuses mainly on one aspect of the shipping network, i.e. the route between Europe and Asia, the so-called *Retourvaart* ('return shipping' or homeward bound shipping). Shipping within Asia itself is therefore not the main focus of these studies.

Initial investigations into the Asian world behind European-Asian shipping began during research for the full-size reconstruction of a 17th century VOC ship. From the mid 1980s, research was carried out for the *Batavia,* wrecked off the coast of Western Australia in 1629. The wreck has been the subject of archaeological research by the Western Australian Maritime Museum in Fremantle since the 1970s (Green 1989). In 1985, a reconstruction project started in the Netherlands. Based on archaeological, historical and iconographic evidence interpreted by traditional shipbuilders, a full size reconstruction was built in the Netherlands (Green & Parthesius 1989; Parthesius 1994). The research question addressed an understanding of the design and construction of the ship. In order to address this, it was necessary to reconstruct the functions of ships like the *Batavia* and the nautical conditions under which they had to operate. The work undertaken for the *Batavia* opened a window on the complexity of the VOC's intra-Asian networks, which in turn motivated further exploration and thus led to the present study. The construction of the 'biography' of ships, like the *Batavia,* through the investigation of the VOC's administrative records listing arrivals and departures as well as ships' journals, correspondence and many other available sources was expanded over time to other ships and a longer period. With this initial work on the reconstruction of Asian voyages, the impetus was given for an extension of the research into Dutch Asiatic shipping.

The lacuna in the information in the existing literature on intra-Asian shipping was even more apparent when the study of the VOC shipwrecks in Galle Bay, Sri Lanka, commenced in the 1990's. The 17th century shipwrecks of the *Avondster* (1659), *Hercules* (1661) and *Dolfijn* (1663), (of which the first two were located by an international team of historians and archaeologists), were not part of the shipping between the Netherlands and Asia, but of the intra-Asian shipping network (Parthesius 1993; 1997). For a proper interpretation of the archaeological site, a better insight into the organisation of intra-Asian shipping was important. The outcome of this research gradually grew into a database that now contains a large amount of information on VOC ships and shipping in Asia for the period 1595-1660[1]. By analysing the development of the VOC ships in service in Asia up to 1660, the research reported here hopes to reveal the interesting and complex world behind the better-known return voyages.

To apply these questions to individual VOC, ships, it was first necessary to understand the total context in which shipping took place. It was, therefore, important to gather detailed information about the ships and ship types that were in service and their areas of operation. Bruijn, Gaastra and Schöffer (1979-1987) provided the starting point for ships that sailed for the VOC between Europe and Asia. However, the expansion of shipping within Asia itself was of crucial importance to the changes that took place during this period. Therefore, in order to reconstruct the complete shipping activities of the VOC, the work of these authors had to be extended. The result was a database of more than 11,000 ships' movements for the period 1595-1660, which proved to be a rich source of information on the development of the trade and shipping networks of the Dutch in Asia. Information was gathered on 1058 ships that took part in the Asian trading network in this period. This database includes ships that started their VOC career in Asia, having been built, captured or bought there. This component of the VOC fleet has not previously been studied, although it is an important aspect of the VOC organisation. The extent of this 'hidden world' of intra-Asian shipping is demonstrated by the size of the fleet involved in Dutch-Asiatic shipping and the fleet that served within the Asian network, which is outside the scope of the Bruijn, Gaastra and Schöffer study. That work lists 529 ships up to the year 1660; the work reported here has identified a further 529 ships and vessels. These are only those ships which were of sufficient size to be included in the records of the time under a specific name. Many other smaller ships and vessels in service of the VOC in this period remain in the shadows of recorded history. Following this method, statistical information became available on the development of Dutch shipping in Asia and the composition of their fleet operating in those waters.

This part of the study was valid as a stand-alone research, but the information gathered allowed further analyses towards a research question that was partly raised by concurrent historical-archaeological research (Parthesius 2003). In the second half of the 17th century, the development of the VOC in Asia reached its peak. It was during this period that intra-Asian trade contributed to a large extent to the economic soundness of the company (Gaastra 1989). The success of this hidden world, behind the better-known shipping between Europe and Asia, gives rise to many questions. The main question simply is: how was the VOC able to achieve this level of organisational success so far removed from the formal management of the Netherlands? Other questions follow: what were the goals of the organisation? What obstacles were they confronted with in attempting to achieve these goals? How were these obstacles overcome? What role did the VOC vessels play in the successful development of an extensive network that, in size, exceeded by many times the European shipping network?

This study focuses on the logistical and technical aspects that made the development of trade and shipping in Asia possible. It examines the development of Dutch shipping in Asia in the first half of the 17th century. The aim is to shed light on the way the VOC developed and managed its complex shipping network and the process by which the VOC gained its experience and adjusted its fleet to the many requirements linked with trade, military-political activities and the maintenance of a network of trading posts and strongholds in Asia.

To what extent was the VOC successful in adjusting their fleet to the demands of the overall organisation and unfolding events in order to conduct their Asiatic operations? The suitability of a ship for a certain function depended on a complexity of features. In order to track the development of the fleet fully, it became essential to study the complete range of functions

possible for a VOC ship. By identifying the specific combinations of requirements and linking them to the logistical elements of the shipping, the problems the VOC management encountered in adapting ships for their purposes can be understood beter. Above all, this study hopes to broaden the European viewpoint on the VOC shipping towards a more inclusive perspective that will inspire further European-Asian historical-archaeological research into this important phase of this shared history.

Structure of the book

This study is based on a compiled record, contained within a database of intra-Asian shipping for the period 1595-1660. It is important for the reader to understand how the information for the list of VOC vessels and their voyages has been gathered and structured. Therefore, the following chapter is dedicated to the database and its design. The research is presented in three parts. Part 1 employs a descriptive approach to present a chronological narrative of the growth and logistical aspects of the VOC organisation and of Dutch shipping in Asia from 1595-1660. Part 2 is a detailed quantitative analysis of information contained in the database, created for the purposes of this study, and which is intended to provide evidence to support, supplement or challenge the conclusions that emerge from the standard account. An appendix with the full list of vessels in service by the VOC during the period under study is included at the end of this book. The full database will be published separate in an electronic format.

2

The database and methodology

Introduction

The database was necessary in order to provide the systematic mechanism through which to fulfil the purposes of this study, and to bring into sharper focus the hitherto obscured story of Dutch shipping in Asia.

As previously explained, the vehicles of the Dutch expansion and their organisation are the central theme of this study. Little systematic research has been carried out on VOC shipping in Asia during the first half of the 17th century. This study will be a contribution towards closing this lacuna in our knowledge of the period 1595-1660. That systematic work on intra-Asian shipping has not been undertaken previously is partly understandable owing to the problematic nature of many of the available sources. For example, the VOC maintained a separate set of administrative records for Dutch-Asiatic shipping, the so-called *Uitloopboeken*, which was the basis for the Bruijn, Gaastra and Schöffer (1979-1987) work; the VOC's intra-Asiatic shipping activities, however, have to be reconstructed from a wide range of administrative and other sources (like correspondence and daily journals of the trading posts).

A few problems were encountered in constructing a consistent and systematic database for the voyages in Asia. The VOC organisation was strongly centralised and most of the administrative documents studied relating to intra-Asian trade passed the desks of the bureaucrats in Batavia. The elaborate administration was very useful in the reconstruction of this network; however, one had to be aware that not every ship sailed through Batavia and not every destination was recorded in Batavia's administrative records. To address this problem and to fill in some of the gaps in information wherever possible, the administrative records of other VOC trading posts were also taken into account.

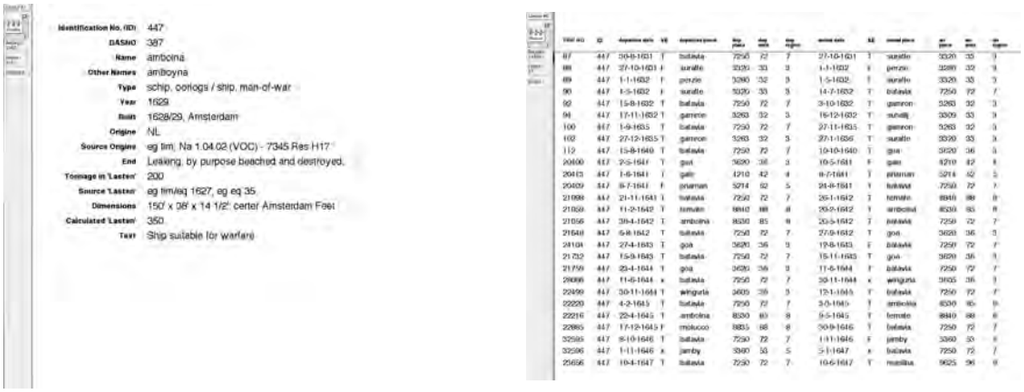


Fig. 2.1: Schematic structure of the databases: (a) VOC vessels, (b) voyages

The main database consists of two primary structures: the database of ships that lists the VOC vessels that were both identifiable and in the service of the VOC, and the voyage database that contains data on departure and arrival destinations. A unique identification number has been assigned to every ship and every voyage in the database. In addition, the ships database con-

tains a large amount of data on the size, building year and vessel type. Modules within the database link the identification number of the voyage, and thus also a specific ship, to information (when available) on crew numbers, cargo size and other technical information like armaments and seaworthiness during a certain voyage of such a ship.

Ships in the database

Many new ships were added to the list of VOC ships already known through the research carried out by Bruijn, Gaastra and Schöffer (1979-1987) in which 529 ships are recorded leaving the Netherlands for Asia up to the year 1660. The database contains a further 529 vessels – a number that excludes the small vessels not filed in the records under their own specific name. This extension was mainly possible because the research was carried out from an Asian perspective, which revealed ships that never left Europe for the VOC, but were built, bought or captured in Asia.

The Bruijn, Gaastra and Schöffer (1979-1987) study was very thorough and complete; not a single ship that left for Asia from the Netherlands was not listed by them. Some small differences did come to light through the detailed research for the database. These are cases where, because of the confusing system of naming ships, a particular ship was listed as one vessel making more than one return voyage, whereas further investigation showed that these were actually two different ships with the same name. The opposite was also possible where ships with different names turned out to be one ship that was later renamed.

The 17th century spelling of vessel names is often arbitrary; therefore, the modern Dutch spelling is used where possible. The system used by Bruijn, Gaastra and Schöffer (1979-1987) has been adopted. In the database all the other spelling forms have been preserved in a separate field. Other names of the same ship – before the ship was bought or captured by the VOC – are also included in that field.

Ship types and rates: Classifying the ships

The original indication of the ship-type has been listed in the database. A limited range of modern terms for a division into general rates and analytical purposes are also given. For example, the descriptions *chialoup*, *chaloup*, *sloep* etc., are all replaced by *sloep* and, in English, sloop. Often vessels turned out to be listed in the contemporary sources under more then one type[2].

From the many resolutions about dispatching vessels to Asia, we know that the VOC considered various types of vessels suitable for the purposes of their activities. However, understanding the composition of the VOC fleet in Asia and measuring the level of differentiation is not simply a matter of adopting the archival terminology for the various vessels. One needs to interpret the available information and design a systematic approach. There is no clear classification available because the ships' construction charters were loosely formulated and the VOC shipbuilders did not always follow the specifications. Furthermore, the VOC fleet also included acquired vessels from diverse backgrounds. The features and models of the various terms for vessels in the 17th century have been under discussion for a long time, in fact, from the 17th century when Witsen (1671) wrote 'the races of the ships are often very much mixed'. Indeed, the same VOC vessel often has differing type indications in primary sources. Contemporary terminology should therefore also be used with caution.

Whilst this study cannot provide a definitive conclusion to this discussion, it can contribute to a greater understanding by systematising the information for one specific and important branch of 17th century shipping, Dutch ships in Asian waters. The detailed analyses of the information that served as the basis for a classification of rates are explained in Chapter 5. In brief, the following steps were taken for this classification: initially all the terms used in the literature to identify or describe a vessel-type were accepted as a starting point. Refinement was then based on the tonnage or *lastmaat* since this can serve as a further indicator of the type

of vessel and also shows the possible diversity for vessels with the same type-indication. Features or functions mentioned in the archives of the shipping history gave further clues for determination of the vessel-types.

By combining data about the type, dimensions and function of the vessel it is possible to classify the VOC fleet into a specific number of rates. As the demarcation between rates in some instances is not clear cut, it may be possible in certain cases, to dispute the classification of a certain vessel as one particular rate or another. However, each rate has its own profile with its own advantages and shortcomings – properties with which the VOC organisation had to cope.

Terminological issues

Ships' dimensions and the ambiguity of the 'last'

In order to understand the role the various vessel types played in the organisation of the VOC, it is necessary to know how the fleet was composed and what features made the vessels fit for certain aspects of the company's activities. Features like cargo capacity, suitability for certain routes and destinations, together with military capacity, need to be looked at. An extensive archive of shipping is available but most of the required information cannot be abstracted directly from that source. One of the most fundamental features of a ship, i.e. its size, creates the first problem.

Although the value of *lasten* was commonly used in the Netherlands in the 17th century to indicate the cargo capacity of a ship, this figure certainly was not unambiguous. In that sense, it resembles the problems we have today with the many definitions of tonnage. The first problem is that the *last* itself, used to describe an amount of cargo, was not a clear dimension. It could be a measure of volume (about 125 cubic feet or 2,7 m3) or a measure of weight (about 4000 pounds or 2000 kilograms). The volume measure was used for light cargoes, where the amount of space the cargo took in the ship's hold was important, whilst the weight measure was used for heavy cargoes. Certainly during the VOC's development phase in Asia, the Company's ships mostly transported relatively light products such as spices. However, these products were sold by weight. To facilitate the calculation of the necessary space on board, 3000 pounds were considered a *last* for pepper and spices. The earliest VOC reference to this issue is in 1602 (NA 1.04.02, VOC 7525, fol. 59; Stapel 1927, pp. 20 and 30). In later records, the quantities of all Asian bulk goods were described by the VOC either in their Asian units or in *lasten* of 3000 pound. So it came about that the Asian *last,* and with it the ships' dimensions described in Asian *lasten,* differed from the European definitions. To make the issue even more complex, the specific use of and temporary modifications to a vessel could also influence the cargo capacity. For instance a vessel carrying its cannon down in the hold and with sealed gun ports could carry much more cargo in terms of weight as well as volume, than the same ship ready for military use. Reports of problems with ships not being able to use their guns are frequent in 17th century shipping sources, not only for war ships, but also for other types of VOC vessels.

Last values in the VOC accounts

If the *lastmaat* is so ambiguous, the questions that arise are how the VOC dealt with this issue in their administration. If we assume that the VOC would also have wanted to know about their cargo capacity, whether it is possible to abstract reliable data from the archival sources. The *lastmaat* of a vessel was also used as an administrative value for the authorities. Vessels of a certain *lastmaat* were considered to be able to transport that quantity of freight and were taxed accordingly. This was obvious for vessels operating on the known routes in Europe with fixed commodities: for instance a 'grain-flute' sailing in the Baltic was designed in such a way that the weight and the volume of the cargo were balanced with sufficient space remaining to ac-

commodate the crew and their supplies. Since the VOC ships first had to sail to Asia before they could be employed on a specific route there, this issue was more complicated. The vessels leaving the Netherlands with large crews and victuals for voyages of many months could use part of their cargo holds for other commodities. From the perspective of the VOC, it would be reasonable to record these vessels as having a relatively low number of *lasten* for their outward-bound voyages. In Asia however, these ships operated with smaller crews, which would increase the cargo capacity to a realistic rate.

Apart from tax purposes, the *lastmaat* was also used in the Netherlands by the VOC for internal administrative purposes to control the agreed distribution of shipping volumes over the various Chambers. The repartition as decided at the founding of the VOC in 1602, applied to many of their activities. For the *Heren XVII*, the distribution of the Chambers' shares in the activities was a constant concern. At the same time, the Chambers were dedicated to maximising their share, for instance by building slightly larger ships. To control this distribution, so-called *egalisaties* (equal division) were conducted to compare the *last* figures of the ships built and/or dispatched by each of the Chambers. These *lasten* had to represent the economic advantages of building and equipping ships and the amount of profit from the Asian cargo that arrived in the chamber. As long as all the ships were built by the VOC and all returned with a cargo to their port of departure, this system could work with realistic cargo volumes. Problems arose as soon as ships were bought instead of being built by the VOC and even more so when vessels remained in Asia. The economic advantage for a certain Chamber would then be minimal. In a number of instances, it was decided that certain ships staying in Asia would not be included in the *egalisaties* (NA 1.04.02, VOC 100, 09-1614 (point XI) & 03-1619 (point VIII) and NA 1.04.02, VOC 147, 05-1624 (point X)). These resolutions were not executed however and all the departed vessels were listed in the *egalisaties*. In general, vessels to be stationed in Asia were given lower values than their real capacity, especially the flutes. This vessel-type was of light construction and sailed with small crews, but could take comparatively large cargoes. For these reasons the economic advantages to a chamber in equipping a flute for an extended stay in Asia were relatively low. Also, in principle, the flutes would not sail back to Europe. This meant that the Chamber would not have the economic advantage of a return cargo, which was represented by an unrealistically low number of *lasten* in the *egalisaties*. No flute is recorded in the *egalisaties* as more than 100 *last*, whereas the real cargo capacity could be as large as 300 *last*.

For other ship types, too, the number of *lasten* in the *egalisaties* represented the opinions of the *Heren XVII* about the economic value for the chamber to which the ship belonged. These ideas changed regularly and so did the *egalisatie* values. Illustrative of this are the regular changes in the *lastmaat* of the largest rate of vessels, the *Retourschepen* (homeward-bounders) that sailed between Europe and Asia. The difference in the VOC's assigned *egalisatie* value for the same ship could amount to more than 30%. For some of the larger ships, the VOC appears only to have taken an educated guess about the real cargo capacity after the ship had returned fully laden from Asia (NA 1.04.02, VOC 100, fol. 328).

Although *egalisatie* values for the number of *lasten* are available for all VOC ships sailing from the Netherlands, these *last* values must be considered to be highly unreliable descriptors of cargo capacity. For more reliable data, one needs to look for a less politically tarnished source such as the so-called *Navale Macht*-lists. At least once a year a list of all vessels available to the Company in Asia, which was named in the correspondence as the *Navale Macht* (Naval Force), was sent to the Netherlands. After 1650, most of these lists also show the *lastmaten* of the ships. Probably, these are most realistic assessments of cargo carrying capacity, as the authorities had to use them to calculate the available cargo space.

Apart from these systematic sources, for the determination of the *lastmaat* for a ship, many incidental references to ship dimensions in *lasten* were also used. When such data was found for certain ships, they were included in the determination of a 'most probable' cargo capacity in *lasten*. The values found for specific ships in the *Navale Macht* lists and the incidental data were also used to calculate more reliable data for comparable vessels for which only numbers of *lasten* from the *egalisatie*s are known. It is this 'most probable' *lastmaat* that was used to classify the vessels in the database and as an instrument to review the total capacity of the VOC fleet.

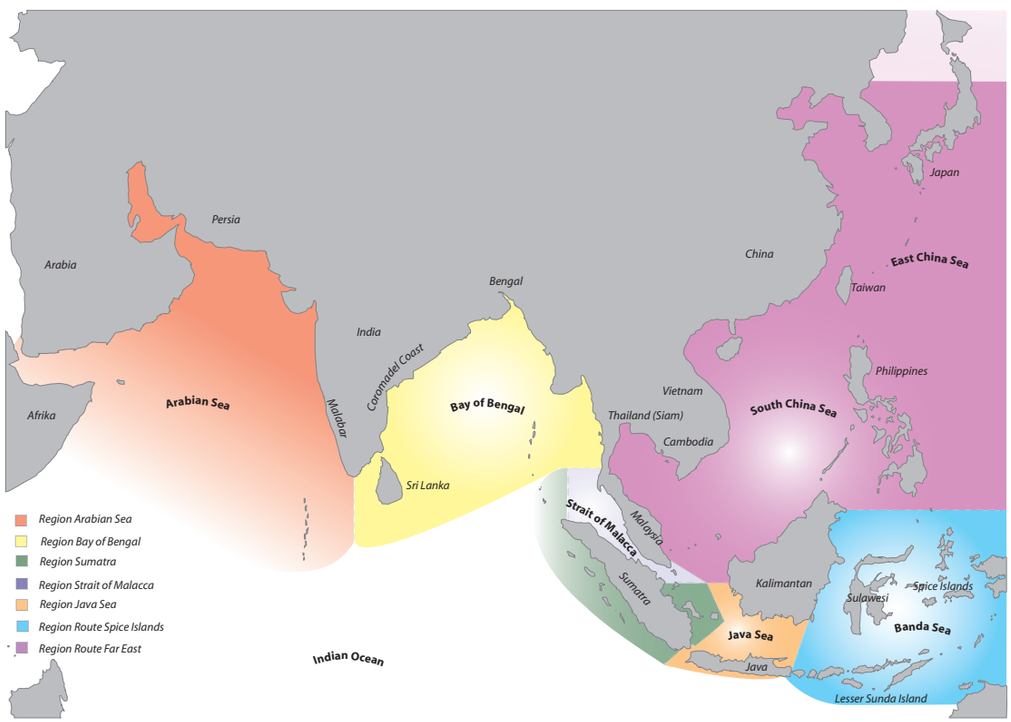
For a general comparison with the modern measure of cargo capacity, the 'tonnage' the *last* value can be multiplied by two.

The structure of the voyages

Shipping destinations, areas and regions

Every destination was initially included in the database under its spelling used in the sources. To systemise the data without losing information on these names, an additional module was developed and every separate destination was allocated a 4-digit code. Historically linked destinations are grouped in 35 areas with a 2-digit code, consisting of the first two numbers of the 4-digit destination code. These areas are chosen following the terminology in the VOC sources as much as possible. On the most general level, the areas are grouped in 7 regions of which the code only contains one number[3].

For instance, in Region 4, the Bay of Bengal, all destinations on the Coast of Coromandel (Area 43) are listed with a 4-digit code starting with 43. All twenty-two variations of the spelling of the destination that is now called Pulicat are listed under the Destination 4350. The largest area is the Strait of Malacca (Area 61), ranging from Phuket (6104 as Udjong Salang) in the north to Cape Ramunia near modern Singapore (6193 as Barbequet). VOC ships patrolling somewhere between these two places are regularly reported in the 17th century sources as being in "*de strate van Malacca*" (6140) without further specification.



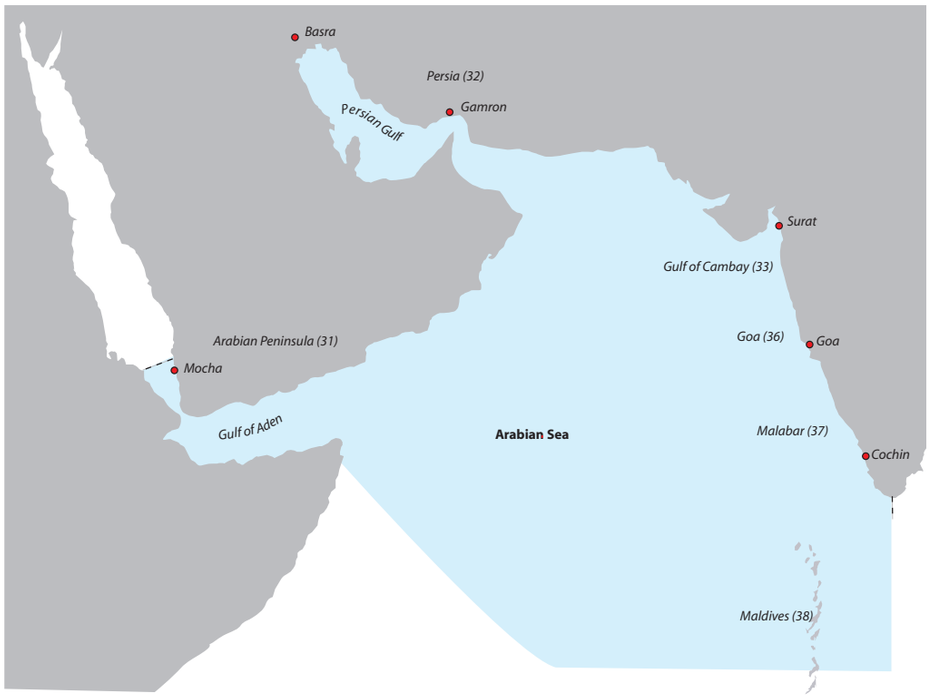
Map 2.1: VOC trading area in Asia with the main shipping Regions

For an overview of the general development of the shipping the following main regions have been identified:

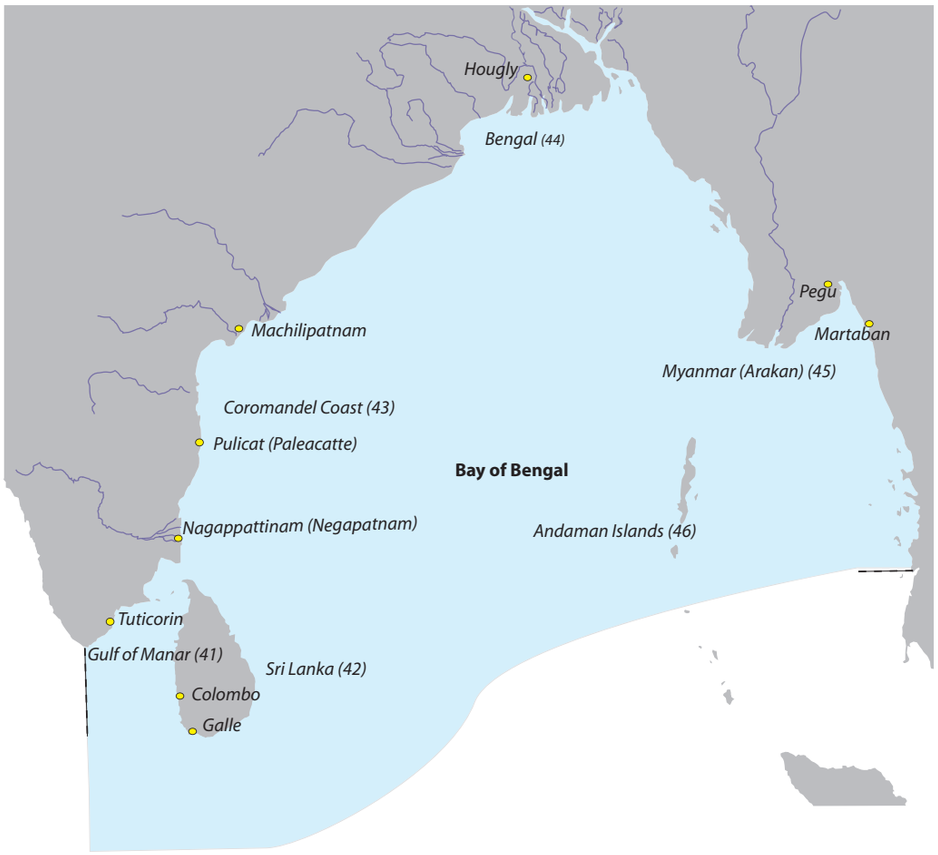
Java

Map 2.2: Destinations in Java (Region 7)
This main region is centred around the headquarters VOC Batavia (Jakarta), but also contains other destinations in and around the Java Sea

The Arabian Sea (Westerkwartier)



Map 2.3: Destinations on the Arabian Sea (Region 3)
This main region ranges from the Maldives in the southeast, the west coast of India to Persia and Arabia in the west.



Map 2.4: Destinations in the Bay of Bengal (Region 4)
This main region comprises Sri Lanka (Ceylon) in the southwest, the Coast of Coromandel in the west, Bengal in the north and the Andaman coast in the east.

Sumatra

Map 2.5: Destinations in Sumatra (Region 5)
This main region includes the whole of the island except the region of the Strait of Malacca which is part of the region Strait of Malacca. Within the region there are three principal destinations. In the North Banda Aceh (Area 51), the ports on the west coast (Area 52) and the south eastern part of the island (Area 53) .

Strait of Malacca

Map 2.6: Strait of Malacca (Region 6)

"Spice Islands" (Banda Sea)

Map 2.7: Destinations in the 'Spice Islands Route' (Region 8)
This main region encompasses Ambon and Ceram, Banda, and the Moluccas. In this analysis, the destinations and stopovers on the route to the Spice Islands are also considered. This route stretches out from East Java and Bali, the Lesser Sunda Islands to south-east Kalimantan and Sulawesi. Also destinations south east of Banda around the Arafura Sea are included.

Map 2.8: Destinations in the 'Far East Route' (Region 9)
This region centres around Taiwan and Japan as the main destinations. China and the Philippines were derivative destinations. In this sector, the regions that were located on the route to Japan and Taiwan could also be independent destinations.

The vessel movements

Since the complete database of ship movements in Asia constructed for this study contains more then 30.000 records about voyages[4] to about 700 individual destinations, it was important to group the destinations. For the analyses of the development of VOC shipping in Asia, only the voyages between two different Asian areas in the network were taken into account/considered[5]. This approach eliminated short local journeys like, for example, vessels sailing from the roads of Batavia to the Island Onrust where their repair facilities were housed, or vessels from the blockade fleet of Goa sailing to Wingurla on the Indian coast to take in supplies.

As a result, a total of 11.700 voyages between 520 destinations in 35 Asian areas were analysed in regard to the development of Dutch shipping in Asian waters until 1660. Grouping the shipping-areas into main regions allowed both a broader view of fleet differentiations to emerge and a general overview of the development. However, these parameters could also obscure important local developments or lend inaccurate statistical weight to vessels that were just passing through a region. It is obvious that the information on the type of vessels active in the waters of west Java does not represent the most suitable fleet for this region, but rather the *total* VOC fleet, since most vessels would at some stage pass through the Dutch headquarters in Batavia. To a certain extent, this situation also occurs at other destinations that served as a junction in the VOC's shipping network. Often, this problem could be avoided by a well thought-out composition of the regions. In some cases this was not that easy. Galle is a good example of a destination that was difficult to place in a certain main region. Its strategic role in the Indian Ocean routes and monsoon system meant that many ships called there on their voyages to and from the Arabian Sea. Shipping to that main region therefore is shown in Galle's and thus in the Bay of Bengal's statistics. As a result, the image of the development of shipping into the Bay of Bengal is distorted by the substantial number of military vessels on their way to the blockade at Goa that used Galle as an assembly point. On the other hand, if the decision had been to include Galle in the Arabian Sea region, the statistics would have been skewed by the groups of small yachts, which were very suitable for the shipping on the Coromandel Coast, but that where assumed to be unfit to operate in the military hostile waters on the west coast of India. Most of the shortcomings that are created by the choice of the region boundaries can be overcome, if in addition to the main destinations, the areas are also considered separately (see chapter 9, 'Fleets per region').

In summary, the methodological problems have been addressed by (a) careful categorising; (b) supplementing the statistical data wherever possible with descriptive information based on a careful scrutiny of shipping movements in each region, so that the picture that emerges from the numbers can be qualified, if necessary; and (c) looking at the picture from several angles, including logistical and organisational perspectives and contextual factors such as the political background.

Sources contributing to the database

The information on the journeys in the database is derived from various historical sources. Most of the early voyages (those of the *Voorcompagnieën* and the VOC till around 1610) are described in detail in the publications of the *Linschoten-Vereeniging*: (Rouffaer IJzerman (1915, 1929), Keuning (1938, 1940, 1942, 1944, 1947, 1949), Foreest & Booy (1980, 1981), Unger (1948), Wieder (1923, 1933), IJzerman (1926), Booy (1968, 1970), Opstal (1972).

Most individual trips between destinations could be recorded from these published primary sources. Only in some cases – mainly the return voyages of the vessels- additional archival research was required. Some voyages of Dutch vessels, not known through Dutch sources could be found in the early voyages of the English to Asia published in the *Hackluyt*-series: Foster (1943, 1967a, 1967b, Moreland (1967).

The journals of the later journeys of Dutch vessels to the *Zuidzee*, such as the voyages of Schouten en LeMaire (1615-1617) Spilbergen (1614-1617), de Nassausche vloot (1623-1626) and Tasman (1639, 1642/43 en 1644) are also published: Engelbrecht & van Herwerden (1945), Warnsinck (1943), Voorbeijtel Cannenburg (1954), Verseput (1954) and Posthumus Meyes (1919).

Secondary sources were initially used for the systematic description of the development of the VOC shipping in Asia after 1610. Many voyages of destinations in Asia could be derived from: McLeod (1927), (de Jonge (1862, 1864, 1865), Tiele (1886), Tiele & Heeres, (1890), Heeres (1895).

The database was further extended and refined through additional published primarily sources and further archival research. The complete correspondence of Coen as published by Colenbrander (1919-1923) and Coolhaas (1952, 1953) provided information on almost the com-

plete VOC shipping in Asia for the period 1614 -1622 and 1627-1629. Batavia's daily journals are available from 1624 (Chijs 1887-1893, Colenbrander 1898-1902, Heeres 1896, Hullu 1903-1904). In these documents the dates of arrival and departure of vessels in Batavia are listed, but often they also contain information on VOC voyages between other destinations in Asia. Since this series is not continuous for the whole period some years would consequently be underexposed in the database. For these years the 'letters and papers from Asia to the Heren XVII' (NA 1.04.02 (VOC) 1053 – 1234) have been used to complement the database. The books with copies of letters sent from Batavia turned out to be a useful source of information on VOC shipping in Asia. Almost all copy-letters contain information on previous correspondence including when and with what ship these letters were sent. Moreover, the partly transcribed and published 'General Missives of the Governor-General and Council' (Coolhaas 1960, 1964, 1968) contains information on various aspects of the development of the VOC in Asia. This source covers the period 1610-1660, but often the exact dates and names of the used ships are not included in this printed compilation. This source however provided an efficient entry point and clues to locate the original source.

Also primary and secondary sources of other VOC locations in Asia were studied in order to counterbalance the predominant 'Batavia perspective'. An extraordinary source of information on 'ships and trips' are the published daily journals of the castle *Zeelandia* in Taiwan (Blussé et. al., 1986, 1995, 1996, 2000). These records contain detailed information on the shipping of this region, especially shipping between Taiwan and the Pescadores and more exact data on shipping on the route Batavia-Taiwan-Japan en vv. and the roundtrip Taiwan-Tonkin-Japan-Taiwan. Information on the exact arrival and departure dates in Japan in Mulder (1985) could be complemented by primary sources in the National Archives (NA 1.04.21, Factory Japan, 75).

The extensive description of military activities on the Chinese coast by Groeneveldt (1898) provided data for the database for the period till 1624. Secondary sources provide information on the contacts of the VOC in areas now known as Vietnam and Cambodia (Buch 1929; Muller 1917). Information on VOC shipping around the Philippines was found in Sloos (1898) but this study covers only a short period. The same applies for other secondary sources for other destinations: Terpstra on the VOC establishment in Patani, Coromandel Coast, the Indian subcontinent and the *Westerkwartieren* (Terpstra 1911, 1915, 1918, 1938, 1947) and also Dunlop (1930) on Persia. These studies cover mainly the development stage of shipping to these destinations. This period coincides with the period that the daily journals of Batavia did not exist or have not survived. This important source provided information for this region for the later period. The starting point for the reconstruction of VOC shipping around Ceylon was the study of De Geer (1895). Archival research on the VOC shipwrecks in the bay of Galle as part of the *Avondster* project offered more detailed information on shipping between Ceylon and the Indian coasts. Some references to voyages to specific destinations were found in detailed studies based on primary sources in the VOC archive, for example: Ayutthaya in Blankwaardt (1921), Yemen in Brouwer (1988), Banda in Chijs (1886), Borneo in Dijk (1862), Australia in Heeres (1899), Mauritius and Madagascar in Heeringa (1895), Timor in Roever (2002), Djambi in Wellan (1926).

Part 1

Development of the VOC shipping network in Asia

3

The Dutch expansion in Asia up to 1660

The framework for this study is the establishment of Dutch intra-Asian trade and shipping. To understand the development of Dutch shipping in Asia to its peak in the second half of the 17th century, it is necessary to outline the initial development of Dutch-Asiatic trade (Gaastra 2003). The Dutch expansion, and the associated growth of the VOC's Asian shipping networks to 1660, is segmented into two periods: the establishment of the organisation up to 1630, and the expansion and consolidation of the VOC network in Asia between 1630 and 1660. Within these periods various stages can be recognised.

In the first stage of the establishment of the organisation – until around 1610 – Dutch shipping was based on a 'fleet-organisation'. A fleet equipped and crewed for a voyage of up to two or three years would sail via the Cape of Good Hope to the Asiatic market. This market encompassed the region from the East coast of Africa to the shores of China and Japan. In Asia, the ships had to sail to several places to obtain the desired commodities before they could return to Europe. In order to purchase these items, other Asian products were often needed for bartering purposes, in addition to the silver and cargo brought from Europe.

It soon became clear that this system of 'returning fleets' was not efficient for both commercial and technical maritime reasons. Establishing profitable trade relationships required a permanent presence at the point of trade so that trade goods could be collected and stored over a long period of time, placing the merchants in a better position to negotiate prices and quality. The ultimate goal of the VOC was to gain a monopoly over particular products, which was only possible if a stronghold was established. Apart from commercial and political considerations, logistical factors played an important role in the changes that took place in the second stage of the development of the organisation after 1610 to 1630. The VOC was confronted more frequently with maintenance problems caused by the extensive periods that ships operated in Asia before the fleets could return to Europe. Relief for the crew on these long voyages was an additional issue of concern. Often ships had to be laid up temporarily or even abandoned during their stay in Asia because of a lack of crew and/or the inability to repair these ships in the absence of the necessary facilities. Obtaining cargo and then planning how it would be divided between the ships of the returning fleet became a *tour de force* for the admiral who was in charge of the operations in Asia. It became clear to the VOC that there was a need for a rendezvous: a central place where ships could be repaired; where spare materials and skilled craftsmen could be available; where refreshments and supplies could be exchanged, since some ships had surpluses that could be used by others; and where ships could bring cargo for collection. On top of this, any efficient organisation was hindered by the discontinuity of management between successive admirals.

In this second stage of the first period, the system gradually changed to a more permanent presence of VOC ships and personnel in Asiatic waters. A permanent management structure was established under a governor-general. In 1619, a VOC rendezvous centre was established at Batavia on the island of Java near the Sunda Strait. In the early 1620s, there was an interesting period of a few years during which the VOC hoped to concentrate on the transport of goods to Europe and leave most of intra-Asian trade to the traditional and private European traders who would take the merchandise to Batavia. Trading posts established in previous periods were closed to save on operational costs. This policy did not seem to be successful and

around 1625 the VOC had to return to their original set-up with a network of trading posts and strongholds to support strong intra-Asian trade.

By 1630, VOC ships had visited most of the trading areas in Asia. The general characteristic of the second period (from 1630 till 1660) was the intensification of the shipping network and the fine-tuning of the organisation. Up to 1650, there was a rapid expansion of trading settlements, fortifications, the semi-permanent fleet and staff in Asia. When in 1650 the position of the VOC was consolidated in the eastern parts of Asia, the company then extended its efforts to the western parts and, around 1660, established a firm position there as well. During the second half of the 17th century, the VOC reached its peak in Asia as a commercial and military organisation.

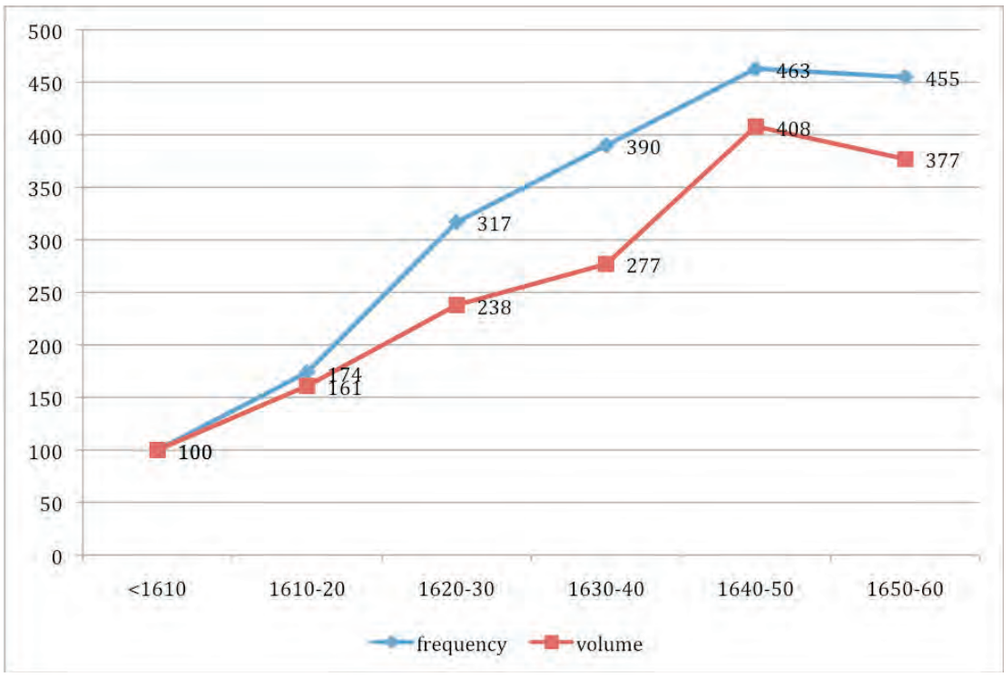


Fig. 3.1. Growth of intra-Asian shipping in frequency and volume per ten-year period (<1610=100) (based Table 8-1 (part 2, chapter 8))

It can be seen from figure 3-1, that up to 1630, there was a steep growth in the number of voyages, consistent with the initial development phase. From 1630 until 1650 there is slower but steadier growth: the existing network is further developed and intensified. In the period 1650-1660, the intensity of the total intra-Asian shipping decreases slightly. If the volume of the shipping is considered, the same development pattern can be seen, though with some small deviations. The total volume of shipping grows until 1630, but the percentage increase is less than the arrivals. After 1630, growth stagnated somewhat, but then there was a steep growth in the volume again between 1640 and 1650, even though there was only a small increase in the number of intra-Asian voyages during this period. The volume stabilises again between 1650 and 1660. The difference between the number of voyages and cargo volume is related to the introduction of various vessel types; this aspect is explained in relation to the composition of the VOC fleet in Asia in chapter 5 and chapter 9.

The *Voor-Compagnieën* and the VOC

Dutch shipping to Asia started during the last years of the 16th century when a direct sea route from the Netherlands to Asia was opened. After unsuccessful attempts to reach the Asian re-

gion via the north-east passages, the Dutch overcame their reluctance to follow the same route as the Portuguese around the Cape of Good Hope. The Portuguese were not just competitors and were predominantly a military enemy since the Netherlands were entangled in a war of independence with Spain. This revolt had made the Dutch the enemy of the Portuguese since Portugal and Spain were united in one royal family. The main concern for Dutch traders and skippers was to establish direct contact with the area that produced the coveted spices and to circumvent the existing trade network in and around the Indonesian Archipelago controlled mainly by Portugal and to a lesser degree by Spain. From the late 15th century, when the Portuguese opened the direct sea route to Asia around Africa, most spices for the European market were distributed from Lisbon. In the course of the 16th century Lisbon's primacy in that respect was usurped by Antwerp. In the same period, the Netherlands developed into the main carrier for Europe and maintained an extensive shipping network. The Dutch were famous for their flexible and cheap shipping arrangements (De Vries & Van der Woude 1995). This situation changed again when Antwerp was occupied by Spanish troops resulting in the blockade of the entrance to the river Schelde by the Dutch in 1585. Although initially it seemed that Hamburg would take over Antwerp's position as the principal supplier of Asian products in north-western Europe, it was Amsterdam that eventually became the most important trade centre.

In the 1590s, the conditions to commence trade and shipping directly from the Netherlands to Asia were most favourable. Despite the war, trade with Portugal continued. The Portuguese however, were unable to maintain their level of imports from Asia, which caused the price of pepper to rise exponentially in Europe. This commercially promising situation and other circumstances in Amsterdam created the incentive to set up the costly and risky enterprise for direct trade with Asia. The Protestant merchants who had fled Antwerp, brought not only their capital but above all, their trading contacts abroad and their knowledge of modern trading methods and organisational forms. In the 16th century, Amsterdam became a centre of expertise and information from which direct trade with Asia could successfully be developed (Lesger 2006, pp. 238-239). The well-developed shipping and shipbuilding sector in the Netherlands could provide suitable ships for such an endeavour. Nautical science had progressed in the course of the 16th century and the most able geographers and navigation experts were available in the Netherlands. An important source of information for the shipping route and the new trade was the information provided by Jan Huygen van Linschoten. His books *Reysgeschrift* and *Itinerario* contain his collected knowledge and experience from his years of service with the Portuguese. The cartographer and clergyman Petrus Plancius also played an important role in the research and development of the sea routes to Asia.

Java was not yet the primary goal for Dutch shipping in the early 1590s when the first steps to find a sea road to Asia were taken. The first initiatives were aimed at finding a direct route to China (the Far East – Areas 97-99) through a northeast passage around Asia. These attempts were stranded in the polar ice; the passage proving to be impossible for a 17th century ship. The ambition to get a grip on the China trade still remained consistent, although at that time it was overshadowed by the push to develop shipping to other destinations. During this period, attempts were also made to reach these eastern regions of Asia through the Straits of Magellan over the Pacific Ocean. Two expeditions were organised in 1598; one by the *Magelhaense* Company, led by Mahu and Cordes, and another, undertaken by Olivier van Noort, which was the first Dutch voyage around the world. Although respectively Japan (Area 99) and the Moluccas (Area 88) were reached by these two expeditions, these routes to Asia were not developed further after the route around the southern tip of Africa (the Cape of Good Hope) turned out to be the most feasible sea route to Asia despite the potential for confrontation with the Portuguese.

In 1595, the first fleet of four ships sailed to Asia around the Cape of Good Hope. Nine Amsterdam merchants, united as the *Compagnie van Verre* (Far Distant Lands Company), raised 290,000 guilders from various investors to fit out four ships and provide the required trading capital. Setting up an enterprise in a company was a common way at the time to share the investment and associated risk. On the return of the ships, the whole enterprise was to be liquidated and the anticipated profits would be divided proportionally between the shareholders. The first expedition was however, not the great commercial success the investors had hoped

for. The fleet took fifteen months to reach Bantam on Java and failed to reach the Spice Islands. After three years, the fleet returned with just enough pepper to cover the costs. Lack of experience combined with the logistical complications of long distance trade and shipping caused many problems during this first voyage. Of the initial crew of 249, only 87 survived and one of the ships had to be abandoned half way because the fleet did not have enough crewmembers to man all four ships (Roeper & Wildeman 1997, pp. 16-21).

Nevertheless, the fact that it was possible for Dutch ships to undertake a return voyage to Asia was a sufficient stimulus for other groups to fit out new fleets. In other cities of the Netherlands, in Holland and Zeeland, companies were established and fleets were dispatched for direct trade with Asia. Between 1595 and 1601 no less than fourteen fleets, 65 ships in all sailed to the Asian market. All these companies, later called the *Voor-Compagnieën* (Pre-Companies), because they were the forerunners of the VOC, had the same structure as the *Compagnie van Verre*. Each voyage was treated as a separate enterprise. The participants or shareholders deposited their investment with the directors of one of the companies. They could not influence the management of the enterprise. Although in principle no permanent organisation could be built up, there was still continuity in the activities of the company if the money from one voyage was reinvested in the next.

The new trade turned out to be so profitable that it almost collapsed under its own success. The Dutch trading companies were in competition with foreign traders, but at the same time they were competing with and obstructing each other, causing significant increases in the price of pepper and spices on the Asian market, whilst bringing down the price in Europe. The result was a weak economic foundation for what was a risky and costly enterprise. For the *Staten Generaal* (States General), the highest body of the then Netherlands Republic, this development was most unwelcome. They were also concerned about the political-military consequences of the war against the Iberian enemy in Asian waters. A well organised trading enterprise and a strong Dutch position in Asia would have its effect on the Spanish-Portuguese power. The States General had already made an attempt to persuade the merchants into collaboration as early as 1598. Negotiations turned out to be difficult and slow since there was a lot of distrust from the smaller cities in the Netherlands towards the dominant position of Amsterdam. It took until 1602 before the *Voor-Compagnieën* merged into one company under the full name *Verenigde Nederlandse Geoctroyeerde Oostindische Compagnie* (United Netherlands Chartered East India Company) in this study referred to as the VOC.

The final agreement to establish the VOC represented a political compromise. The VOC was a decentralised company that resembled the constitution of the Republic of the Seven United Netherlands, where cities and districts had a high degree of independence. The organisation was centred round the so-called *Kamers* (Chambers), representing the cities of the former *Voor-Compagnieën*. There were six Chambers: Amsterdam, Zeeland (Middelburg), Hoorn, Enkhuizen, Delft and Rotterdam. Each Chamber had its own Board of Directors, with the VOC's general management consisting of a central board of seventeen directors, the so-called *Heren Zeventien* (Gentlemen of Seventeen). Like the Republic of the Seven United Provinces (Netherlands), the Chambers also had a great degree of independence. They had their own facilities like warehouses and offices and organised auctions of Asian products within the framework of prices and quantities agreed upon by the central management. However, all the activities of the various Chambers were dictated by a distribution formula laid down in the VOC Charter[6]. Amsterdam represented one-half, Zeeland one-quarter and the smaller Chambers one-sixteenth of all the activities. Political compromise was also the reason for the remarkable number of seventeen central directors. Sixteen directors would have conformed to the distribution formula; however the fear of Amsterdam assuming a dominant majority position by virtue of its size, meant that Zeeland and the smaller Chambers had to have a seventeenth director to neutralise this power. This formula was applied to activities ranging from the building and equipping of ships to the division of Asian products shipped back to the Netherlands. In the administration of the VOC, *egalisiatie* (equalisation) was an important term that created many administrative and logistical challenges. It was often a complicated management assignment to load the agreed quantity per formula of the various Asian cargoes onto the ships returning to the respective Chambers. For that reason shipbuilding was very strictly regulated, particularly be-

cause Chambers that built bigger ships than agreed would have been able to transport a larger quantity of cargo and earn more profit.

The VOC was supplied with a considerable capital from large and small investors, the total investment being 6.5 million guilders. The VOC is often compared to a modern limited liability company; indeed, the shareholders were only liable for the amount of their investment. However, unlike modern companies, the shareholders had little influence over management. The VOC directors had from time to time to deal with complaints and political opposition. With some material concessions and political support, this opposition could usually be overcome. The government had granted an official charter providing the new company with extensive powers. The organisation and the structure were outlined in 46 clauses. The States General transferred important rights to the VOC, basic to which was the sole right to fit ships for trade east of the Cape of Good Hope or through the Straits of Magellan. Some sovereign rights were also transferred. The VOC was authorised to make treaties with rulers and states in Asia, to build fortifications, and to undertake military operations, but they could not operate completely independently from the Dutch government. VOC senior officials were obliged to swear their loyalty to the States General and on every return of the ships, a report was to be submitted about the state of affairs in Asia. The charter of 1602 was granted for 21 years, thus in 1623 the VOC had to apply for an extension. On this occasion, some changes were made to the clauses; as a result of complaints, the shareholders were granted more rights and some restrictions were imposed on the directors of the VOC. The internal structure with the division of assignments over the separate Chambers however, remained unchanged. Although every extension of the charter gave rise to negotiations with the States General, the VOC became a strong and permanent organisation, with a structure that was unprecedented at the time.

Searching for a suitable organisation in Asia up to 1610

The Dutch, more than their Portuguese, Spanish and English competitors, became deeply involved in the organisation and control of their trade and shipping in the Asian region. This development was based on the economic-political strategy followed by the Dutch. The VOC aimed for the control over purchasing of specific products in Asia, hoping to acquire a monopoly on particular items such as spices. The general idea was that if they were able to prevent competition, mainly from the European traders, they would be able to dictate purchase prices, control the export and therefore also, to a certain extent, the selling prices in Europe. Another important objective of the VOC was to minimize the import of money from Europe into Asia, and to fund the operations in Asia and the purchase of the return cargo through intra-Asian trade. To meet these ambitions, it was essential to participate in the existing trade network in Asia. An essential pre-condition to this was the availability of local products for the Asian trade. Most European products, apart from money and bullion, were of minimal value on the Asian markets or could only be sold in small quantities.

The main goal of the *Voor-Compagnieën* was purely commercial; nevertheless, they were also equipped for confrontations with other European nations[7]. They expected a strong Iberian influence in Asia since the Spanish and the Portuguese controlled important strongholds on the traditional trading routes. By aiming for the commercial centre, Bantam, on the island of Java, the Dutch hoped to steer clear of the main Portuguese spheres of influence, like Goa and Malacca. Bantam seemed to be the ideal place to set up trade because of its long history as a centre for pepper and spice trade and its international contacts, for example, with the Chinese traders. The Dutch, however, were misinformed and found out on arrival that Portuguese merchants were present in Bantam. But the Portuguese power in most places in Asia was not absolute, and in Bantam it was very limited; in fact they were just one of the trading nations in Bantam and in that sense were equal to the Dutch. Until the arrival of other European nations in Asia, there was no need for the Portuguese to establish a firm position there. As Spain and Portugal were the only nations already trading in Asia, they maintained strict control over their regional market. With the arrival of competition in that market their only recourse was to the strong political influence that they wielded in order to attempt to disadvantage the Dutch merchants.

This kind of political conspiracy made it clear that a purely commercial trade arrangement would be impossible and that violence and confrontation would be inevitable, not least because the Dutch government was in favour of exporting the war against the Spanish and their allies to Asia. Notwithstanding this, the directors of the *Voor-Compagnieën* could not be persuaded to organise military action in Asia. On a more practical level however, the Dutch ships' crews were quite keen to attack the Spanish and the Portuguese for their often very lucrative loot. The Dutch government sanctioned the capture of enemy ships and the division of a part of the spoils amongst the crew. Soon the capture of ships became an important strategy of Dutch-Asian trade: the capture of Portuguese ships proved to be a rich source of commodities such as porcelain from China. Sometimes, the Admiral appointed by the directors of the VOC as the commander of a fleet, could decide to use violence against the enemies of the local rulers with whom he was in negotiation about a trade contract, especially if the Portuguese were these enemies or allied with them. It is interesting to realise that inter-European relationships were sometimes somewhat confusing from the Asian perspective. Often, the Dutch had to prove their independence from their fellow Europeans, the Portuguese.

The active and also passive military support of local rulers turned out to be a useful tool both in cementing Asian relationships and at the same time fighting the competition. In 1600 Admiral Steven van der Haghen assisted a local ruler in Ambon in his fight against the Portuguese in exchange for an exclusive trade contract in cloves. In reaction, the Portuguese sent a war fleet from Goa. They encountered with Dutch ships in the waters of Bantam. The Dutch won this first full-scale sea battle between European powers in Asia, but temporarily lost their stronghold on Ambon.

Shipping from the Netherlands to Asia had grown so rapidly that competition between the various Dutch companies also created problems in Asia. The competition between the many Dutch ships arriving in the same period drove prices up, while the prices in the Netherlands were under pressure when the supply of goods for auction sometimes turned out to be overwhelming. This, together with the desire of the Dutch government to organise military action in Asia, formed the background to the pressure the Government put on the various companies to unite under the banner of the VOC. In March 1602 the Dutch State granted the VOC the rights to all trade and shipping in Asia.

The policy towards the Portuguese and Spanish opponents changed with the establishment of the VOC. The Admirals of the first VOC fleets were sent off with instructions to provoke the enemy. The general aim of the VOC directors was to have outward-bound fleets attack the important Portuguese strongholds on their way to Asia. Once in Asia, they were expected to trade and return to the Republic. The first four fleets of the VOC (1603-1607) had first to lay siege to Mozambique, Goa and Malacca before they could then attack the Portuguese fortifications at Ambon, and the Moluccas. It was clear that this plan was overly ambitious. Even if an attack was successful, it was difficult to sustain the new position of power. Every time they captured a Portuguese stronghold, as was the case in 1602 at Ambon and in 1605 at the Moluccas, the VOC had serious difficulties defending these places after the ships left for Europe.

The VOC had to change their policy or their organisation in order to be successful in their attempts to monopolise the important spice trade. Not all the VOC investors supported this aggressive policy of the first years. Some of them objected to the excessive force of violence for religious reasons; others were just concerned about the commercial effects of this policy (Westera 1994). The essential difference from the earlier practices of the *Voor-Compagnieën* was that finances were not settled at the end of every expedition; the directors could now reinvest any profit in a new equipage. In reality, this meant that the participants did not see any returns from their investments for many years. The opposition to use the VOC as an extension of the State policy against the Iberian enemy was growing. When in 1609 the Republic signed a suspension of arms with Spain that excluded Asia, the government was forced to support the VOC in the continuation of hostilities on the other side of the world. They provided ships and armaments, but more importantly, they protected the VOC against their own investors who had become dissatisfied with the low return on their investments and were even calling for the VOC to be disbanded. The government's support gave the directors the space to make changes in the organisation of the VOC.

Building a permanent structure in Asia up to 1630

The political structure

Around 1610 the VOC organisation was transformed from a 'floating structure' to a more permanent establishment. Until then, the execution of the VOC's activities in Asia were in the hands of the Admirals of the successive fleets. This system could easily lead to inefficient management of an already complex organisation. It was almost impossible for the arriving Admiral to get a good overview of the whereabouts of the fleets and merchants. In this way it was very difficult to build up a position on the Asian market and to maintain a power base. Passing trade was not profitable and it was very hard to develop relationships with the local rulers.

The solution to these problems came with the establishment of a permanent presence and structure in Asia. As early as 1599 on the Spice Islands and 1601 in Bantam, staff members were left behind to organise trade in the absence of the fleet[8]. In 1604, Wybrand van Warwyck, the Admiral of the first VOC fleet, was allocated a stone building and a yard in a central position in Bantam. In fact, he established the first VOC headquarters in Asia with a mission head and a council. His instructions were to organise trade and shipping, to oversee administrative processes but also to hinder the Portuguese and to make preparations for Dutch families to be housed (NA 1.04.02, VOC 99, fol. 39, 189). From 1609, the VOC appointed a Governor-General as the highest authority in Asia. The Governor-General was the head of a *Raad van Indië* (Council of the Indies) that formed the delegated government to oversee the interests of the VOC.

In addition to pepper, the core business of the VOC was the trade in spices from the islands of the eastern archipelago. The main assignment of the first Governor-Generals, Pieter Both (1610-1614), Gerard Reynst (1614-1615) and Laurens Reael (1616-1619), was to obtain a monopoly on spices. They were allowed to sign treaties but could also use force if that was thought to be appropriate. Through the earlier treaties made by various Admirals before 1609, the VOC had the exclusive rights to buy cloves, nutmeg and mace. Since both the formal partners and legal background of the contracts were disputable, it was very difficult to exercise these formal rights. The VOC had to get heavily involved in local politics on the Spice Islands and the use of force became part of their trade policy in this area, a situation that did not always sit comfortably with all the VOC directors. Violence against the Portuguese and Spaniards in Asia was not an issue since the truce, that prevented a military confrontation in Europe, excluded Asia. The Spaniards were heavily attacked on the Moluccas and some military expeditions were sent to the Philippines in 1613. Fighting another European competitor, the English East India Company, was more complicated. Although, in the opinion of the VOC, they also violated their rights, since they refused to recognise the VOC's claims in this area, the directors in the Republic were not keen to use the force of arms against them because they did not want to lose the support of England in the European political arena. Instead of fighting them an attempt was made to turn the English competitors into partners.

Governor-General Reael was not unsympathetic to such a solution. One of his council members, Jan Pieterzoon Coen, as Director General responsible for the trade policy of the VOC in Asia, had other ideas: his ambition to rule out all foreign shipping around the Spice Islands allowed little room for such co-operation. On the contrary, his policy was to head for a violent confrontation. The English East India Company had supplied local rulers with weapons and in 1617 the capture of English ships led to direct conflict.

The relationship with the Asian nations was no less complicated and full of dilemmas. If the VOC followed their strategy of banning all foreign shipping, they would also cut the region off from the traditional Asian shipping and trade. The Dutch would hardly be able to replace this lifeline of the inhabitants of the Spice Islands to essential supplies and import products. The local rulers would also not be pleased to lose their income through taxes on this trade. Once again the Governor-General Reael and the VOC directors in the Netherlands had conflicting opinions: Reael felt that by enforcing this ban on the region, the VOC would damage itself. He predicted serious economic consequences for the whole region if indeed the VOC failed to take

over the role of the foreign traders (Coolhaas 1960, pp. 72-73). The VOC, convinced that he was the right person to implement the VOC strategy in Asia; they appointed him Governor-General in 1617[9], a step that would prove to be a turning point for the organisation in Asia to a hard-line approach. Coen's opinion had been clear for some time: 'Trade without war, and war without trade cannot be maintained'. He had therefore already been requesting the means and the money from the Netherlands for some time to pursue his philosophy. Coen's view was that if the Governor-General did not have the means to fight, then he would not have the capital to trade. If there was enough budget available in Asia, it would be possible '[…]with the fruit of the same [trade capital] to maintain all the forts, trade posts, ships […] soldiers and garrisons that the gentleman have in *Indië*' (Colenbrander 1919, p 98).

Coen was a dynamic manager but had a talent for making himself very unpopular. At the end of 1618 hostilities broke out between the English East India Company and the VOC after four English ships were captured in 1617 and 1618 near the Spice Islands. The English sent a fleet in retaliation to Bantam and Jayakarta (then still a small trading post). In the confrontation that followed, Coen defeated the English and took advantage of the situation to take Jayakarta and transform Batavia into the rendezvous for which the VOC had long been searching. Although the relationship with the rulers of Bantam had not been very warm up to that time, from then onwards, when the VOC became sovereign in the region, Coen ran into direct conflict with the neighbours of the Dutch settlement. Consequently, the VOC periodically blocked the port of Bantam until 1659[10]. On land, Coen had also to defend the position of his newly established VOC headquarters against the state of Mataram, who controlled the main areas of Java and Madura. The raids on Batavia in 1628-1629 especially threatened the position of the headquarters of the VOC in Asia. It took until 1646 before the VOC could develop friendly relations with the sultanate of Mataram.

Coen could not benefit from his victory over the English fleet in 1619. The VOC directors had decided that instead of fighting the influence of the English, the English East India Company and the VOC had to join forces in the development of the trade in Asia at the expense of the Iberians. Costs and profits were to be shared on a proportional basis. This set-up was not very sound, since the VOC was much stronger than the English East India Company. It was very difficult for the English to meet their obligation to provide ships for military actions in the early 1620s to the Philippines and to the Arabian Sea. The VOC was also not very keen to stick to the treaty, and the promised spices were only provided in dribbles. In 1623 this cooperative arrangement came to an end.

The practical organisation: 'round-trading-tours through Asia' and the start of the shipping network before 1620

In the period before the establishment of the central emporium, Batavia, in 1619, Bantam served as the logistical centre for the VOC. The main role of the VOC organisation in Bantam was to direct the trade and shipping in Asia and to organise the return cargo for the European market. It was not always easy to combine all the aspects of trade and shipping and to fulfil all the ambitions of the organisation. The VOC directors in the Netherlands were very demanding: they were aiming for self-contained Asian trade and shipping and on top of this it had to be profitable enough to cover the costs of the return cargo for the European market . Initially, the VOC's trading activities were aimed at obtaining pepper and spices for the European market, but gradually they came to understand that in order to make the Asian trade profitable, they had to become involved in the Asian trade system itself. This forced them to trade in products that were not originally meant for the European market. In the first twenty years many ships had to sail around the region to trade and collect cargo in various places before the return cargo was finally assembled and the ship could sail back to Europe. During the first years of the VOC, the directors had recognised the importance of the intra-Asiatic trade. In this period in Asia, the VOC had learnt the importance of textiles as 'currency' in intra-Asian trade. The set-up of this intra-Asian trade also required adaptations to the logistical organisation. In the 1610s, when the VOC was engaged in setting up a permanent organisation

in Asia but did not have a firm basis of operation to work from, the problems they encountered to combine trade and military actions are apparent. It is interesting to note that in this period the Governor-General often operated from the Spice Islands, using this area as the centre for political and military decision making; while the Director responsible for shipping and trade had his base in Bantam on the island of Java, a more central location that was accessible the year round.

A so-called *retourvloot* (returning fleet or homeward bound fleet) sailed back to the Netherlands annually. At first, ships sailed back alone or in small fleets, but later the VOC organised the return voyages in larger fleets only. Around 1610, various ships had to abort their return trip to Europe or were even lost, because of their poor condition after their long service in tropical waters. Initially, the VOC directors were in favour of sending ships to Europe as soon as they were loaded, thus avoiding further weakening of the ships that had already been in the tropical waters for a long time. Soon they realised that better regulations could create greater advantages. Sailing in a fleet provided better support in the event that ships lost part of their rigging, were leaking or ran into other problems during their trip over the Indian and Atlantic Oceans. Around 1620 those problems were mostly solved because the ships were better adapted to their more specialist function and they also had a faster turn-around time in Batavia. They were not often employed to sail on an intra-Asiatic route before they sailed home, as was common before 1620. However, ships were still sent in convoy for mutual assistance but above all to make sure that all skippers stuck to the agreed route and sailing scheme that would bring the ships back in Europe before the Autumn.

The VOC's administration in Batavia endeavoured to dispatch a fleet around New Year for arrival in the Netherlands in the European summer. This was not an easy task since they had to deal with many variables, such as gathering the return cargo, planning the supply from the various trading posts and allowing enough capacity to ship the goods to Batavia. Shipping was organised in such a way that the various routes were synchronised; however, delays could easily occur as shipping routes were often subject to the monsoon. It frequently happened that the return fleet was delayed, waiting for other vessels to arrive from their various departure points. In the end, final decisions were based on economic considerations above regulations: to keep a fleet waiting created extra costs and risks, so sending the ships off on time was the usual choice. However, if cargo for Europe arrived too late from an Asian destination, storage in Batavia until the next return fleet meant more expenditure. The net result was that, although it was forbidden, ships were dispatched to Europe in the few months after the fleet had departed almost every year.

The decentralised organisation of the VOC and specific demands from the Netherlands made the job of the directors in Batavia even more complex. They had to make sure that the requested volume of cargo was transported, but also that the volume was divided between the ships of the specific Chambers (*Kamers*) of the VOC in the Netherlands. They had to endeavour to ensure that the cargo on a ship sailing back to Amsterdam, Zeeland or one of the other cities represented the correct ratio for the internal distribution of cargo. It was also important that the ships arrived in the Netherlands in the late summer, before the start of the stormy season, at a favourable time for the auctions but still with opportunities for ongoing transport connections within Europe.

An attempt to reorganise the Asian trade and shipping: 1620-1625

Developments up to 1620 laid the groundwork for the growth of an extensive network in Asia. In regions like the Spice Islands, the VOC was able to establish a firm position that allowed them to dictate trade and shipping. Governor-General Coen's determined objective was to extend his influence militarily into Spanish and Portuguese controlled areas, but it became clear that success would come at a price with ramifications for trade and shipping. It seems that the VOC had over-estimated its capabilities and was forced to make fundamental decisions about the organisation of trade and shipping in Asia.

As part of the (mutually reluctant) cooperation with the English, a 'fleet of defence' was sent to the Philippines in 1620. Although the booty captured from the Chinese junks was substantial, the combined action against the Spaniards was not very successful and the alliance soon broke up. Other VOC ships were then employed directly on the coast of China to break open the Chinese market. So, once again, fewer ships were available or suitable for regular trade. This situation became worse when attacks on Portuguese strongholds intensified again after the end of the truce that had lasted for 12 years. At the same time, expansion of the many trading posts was also responsible for a rise in operational costs. It was obvious by then that not all the VOC's ambitions could be fulfilled and that decisions had to be made to reduce costs. On Coen's advice, the VOC tried to concentrate on the shipping of cargo to Europe, leaving the intra-Asian trade to local traders and the private European operators. Even the monopoly on trade in the Spice Islands was no longer sacred. In a letter from 1621, Coen suggested to the VOC directors that Ambon could be used as an emporium where locals and traders from the Orient could bring items from the Chinese trade to be shipped to the Netherlands, thus relieving the VOC of many expenses. For other destinations, too, he hoped to arrange affairs in such a way that 'many Indians would sail for us and thus [that we], without investments and adventures, enjoy a fair amount of their profit' (Colenbrander 1919, p. 726).

Coen was reluctant to recommend that European private traders (*vrijburgers or vrijlieden*) operate in Asia because, in his opinion, this group consisted merely of 'scum'. Still the VOC could not ignore this growing group of *vrijburgers*, mostly former VOC employees who stayed in Asia after they had served their contracts. In order to organise the private trade for the future, Coen recommended establishing colonies of good officers and reputable families who would, together with slaves, be able to organise affairs in Asia (Colenbrander 1919, p. 795). His successor, Pieter De Carpentier, extended this policy to include the role of private traders and wrote to the VOC directors in the Netherlands: 'Liberate all trade also for the *vrijlieden*, except for the Spice Island, Paleacatte (Coromandel Coast) and the Chinese and Persian silk and indigo. Through a price policy and by force at sea, the trade should be directed to Batavia, which means that then many trade posts could be lifted' (Coolhaas 1960, p. 145). The initiative to set up this policy to stimulate a colony of *vrijburgers* with associated opportunities for free trade was taken by Coen before he left Asia for Europe in 1623. It was clearly not yet an official policy, but pending a formal decision, the developments were tolerated. On his return to the Netherlands, he was able to present his plans to the directors of the VOC for the restructure of the organisation in Asia onto a 'new footing'. Initially, Coen could count on sympathy for these plans and some of his suggestions were followed up. On the instructions of the directors in the Netherlands, large ships were only to be used for the return shipping between Europe and Asia, whilst yachts were to be used in Asia. Using these specific vessels, proportionally equipped by the VOC Chambers in the Netherlands, would also help the management in Asia to follow the proportional division of return-cargo between the various Chambers (Colenbrander 1919, p. 559). Coen also suggested opening a direct link with Surat and the Coromandel Coast from the European Chambers (Colenbrander 1919, p. 791). The directors followed this advice by sending several ships directly to Surat in this period.[11] As a consequence of this policy, most trading posts could be closed. Coen advised that only Surat, Coromandel, Japan and Solor should be continued – as long as the private traders did not take over the trade in sandalwood.

In 1623, the trading posts in Patani, Sangora (north of Patani), Siam, Cambodia and Atchin were closed. During this period, various initiatives by European private traders to develop shipping on these routes can be seen. For example, in 1625, *vrijlieden* sent various ships '*with special commission and permission'* to places like Jambi, Siam and Patani to set up trade, and bring the most sought after food supplies to Batavia (Heeres 1896, pp. 135, 182). Even the trade to Coromandel was released by the VOC on condition that the private traders paid appropriate customs duty (Colenbrander 1919, p. 796).

Gradually however, opposition to these plans arose. Coen ended up in a highly political power game over his 'new footing' policy. The political arena included, apart from the *Heren XVII*, Reael as former Governor-General opposing the plans of his successor, a group of active *dolerende* (dissenting) shareholders, complaining officials in Asia and the Dutch government.

Under discussion was the question of whether private traders should be given access to infrastructure developed for the Asian trade that had been funded by investments made by the VOC shareholders and the Dutch state. Efforts by the government to get involved generally resulted in unwillingness by the VOC directors to bring the decision-making process to a conclusion. When Coen left the Netherlands in 1627 to serve his second term as Governor-General he was no longer seen as a promising talent who could reorganise the VOC organisation in Asia. Instead he was rendered powerless in his decision-making capacity when his proposal for the 'new footing' was finally turned down at the end of 1627. From then on the *vrijlieden* were banned from the most lucrative trade in Asia and the VOC would build further on intra-Asian trade that proved to be very profitable indeed.

The expansion of the VOC network up to 1660

After 1625 the VOC network in Asia was in place but it would still take many years and a lot of effort to establish the organisation that led to the strong position of the VOC in Asia. There was no systematic approach to this development. Progress was dependant on the local situation as well as the available means. An understanding of this progression is important for further analysis of VOC shipping to 1660.

The situation in the eastern region

The focus of the intra-Asiatic trade around 1630 remained the Spice Islands – Ambon, Banda and the Moluccas – in the eastern part of the Indonesian Archipelago. The eastern Banda Island group was the only place where nutmeg was grown and harvested in the 17th century. The original population of the island had been completely annihilated by the VOC and replaced by a newly imported populace who were only allowed to sell nutmeg and its by-product, mace, to the VOC. Ambon was the island from which the VOC tried to control the clove trade, which was much more difficult to regulate than nutmeg..

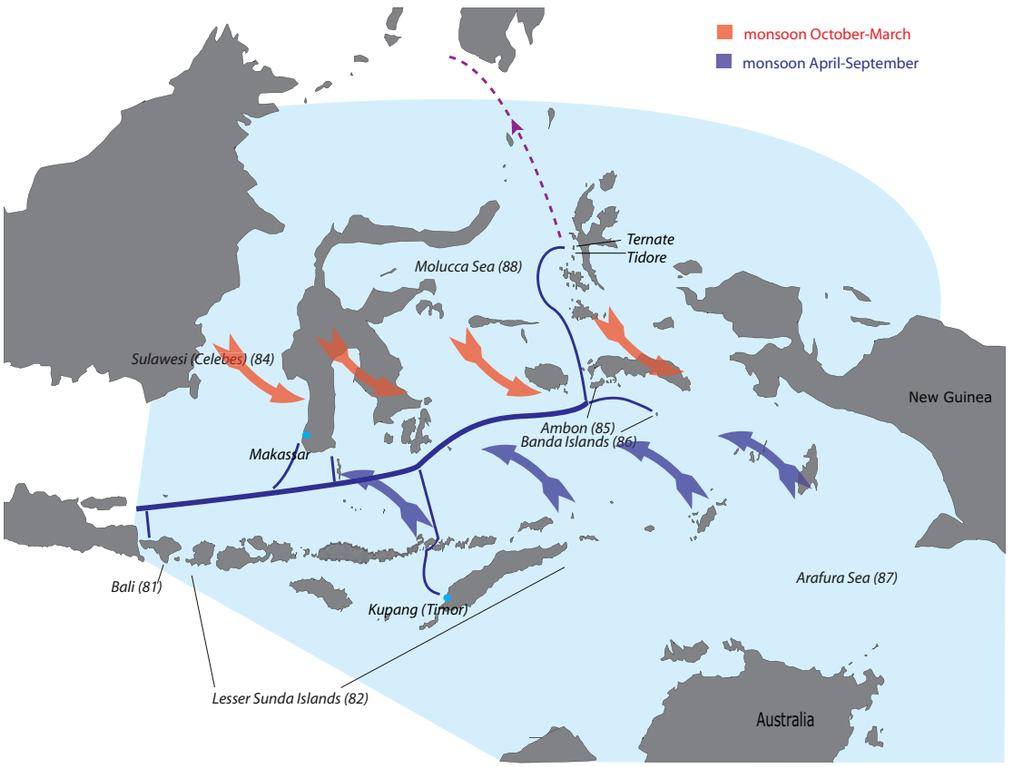
Most of the European return-cargo, besides pepper, came from this area. Sailing from Batavia to the Spice Islands was only possible between late October and early March. Return trips were only possible between April and early October. On this route Timor and Solor, close to Java, were separate destinations instead of stopovers.

Since this route to the Spice Islands was so important for trade and so monsoon-dependent, the VOC experimented with sailing off-season using smaller ships, or on an alternative route, south of Java or west and north of Sulawesi. These attempts never lead to regular, commercially feasible shipping off-season.

Before 1630, it was difficult for the VOC to enforce their desired monopoly over mace and nutmeg on the rulers and inhabitants of the Banda Islands. The VOC directors in the Netherlands were in favour of an aggressive policy but they hesitated to order a large-scale operation against the local rulers in this region. The effectiveness of a policy that did not have the cooperation of the local rulers was questioned (Coolhaas 1960, p. 63). In earlier days, the main strategy was to put a blockade on trade and shipping, which was, in itself, already harmful to the Banda islanders. However, after Coen was appointed Governor-General, things took a dramatic turn for the local population. In 1621 a military expedition consisting of 2000 soldiers overran the main centres on Banda. By replacing the existing inhabitants with a VOC selected population, the absolute monopoly on mace and nutmeg was achieved. The traditional island community ceased to exist.

For the monopoly on cloves, Coen followed another policy. Cloves were grown over a large area of many islands near Ambon (Ceram) as well as in the North-Moluccas. Coen negotiated a treaty with the ruler of Ternate, who had nominal authority over large parts of this area; this treaty was forced upon all his subjects and at the same time all clove shipments not exported by the VOC were declared illegal. In the 1620s, Coen organised the *hongi* expeditions[12] to destroy clove trees and other crops on the Moluccas. He had hoped to make the 'illegal' production of

cloves impossible. In practice, it turned out to be very difficult to control the region and the so-called illegal trade. On Ambon, the VOC forced the locals to assist in the *hongi-expeditions* and to sell the cloves on VOC conditions. The strategy failed and the result was a long-lasting state of war with the Ambonese. Eventually, in 1656 the VOC was able to achieve its goal of a monopoly over cloves but again only after first destroying the original population.



Map 3.1: The region of the Spice Islands indicating the routes and monsoon winds.

The north-eastern region: China, Taiwan and Japan

The 'Far East' included destinations north-east of Singapore around the South China Sea like Patani, Siam, Vietnam, the South Chinese coast and Taiwan with the Korean peninsula and Japan as the most distant. The Chinese market was another focus of the VOC right from the start of Asian shipping. Expectations for this market were high. The hope was that the silk trade with Japan would be sufficient to finance the whole VOC trade in Asia (Colenbrander 1922, p. 594; Colenbrander 1934, p. 322). A number of nations conducted trade in Chinese products. The Portuguese transported merchandise from Macao to the European market via Malacca and Goa. The Spaniards had their cargo transported by Chinese Junks to the Philippines from where it was shipped by galleons to Mexico. From the Mexican east coast it was taken over land to the west coast and over the Atlantic Ocean to Spain. the Chinese themselves traded directly with Indonesia and Malaysia. Portuguese, Spanish and Japanese traders were active along the coasts of Malacca via Siam and Vietnam to Japan.

The VOC wanted to trade directly with the Chinese but access to the Chinese market was very restricted (prohibited by the Ming court) and the Portuguese were also very successful in obstructing the Dutch attempts. On the first visit by the Dutch in 1601 the Portuguese, fearing for their position, had the Dutchmen hung on the pretext that they were pirates (NA 1.04.01, Voorcompagniëen, 158). This pretence seemed to have been something of a self-fulfilling prophecy, since the Dutch realised that the best method to acquire Chinese merchandise was in fact

to capture the vessels, sailing for the Spanish and Portuguese, carrying these goods. Large profits were made from cargo captured from Chinese junks on their way to the Philippines. These captured products allowed the VOC an active role on the Japanese market, but excluded them from a direct link with the Chinese production areas.

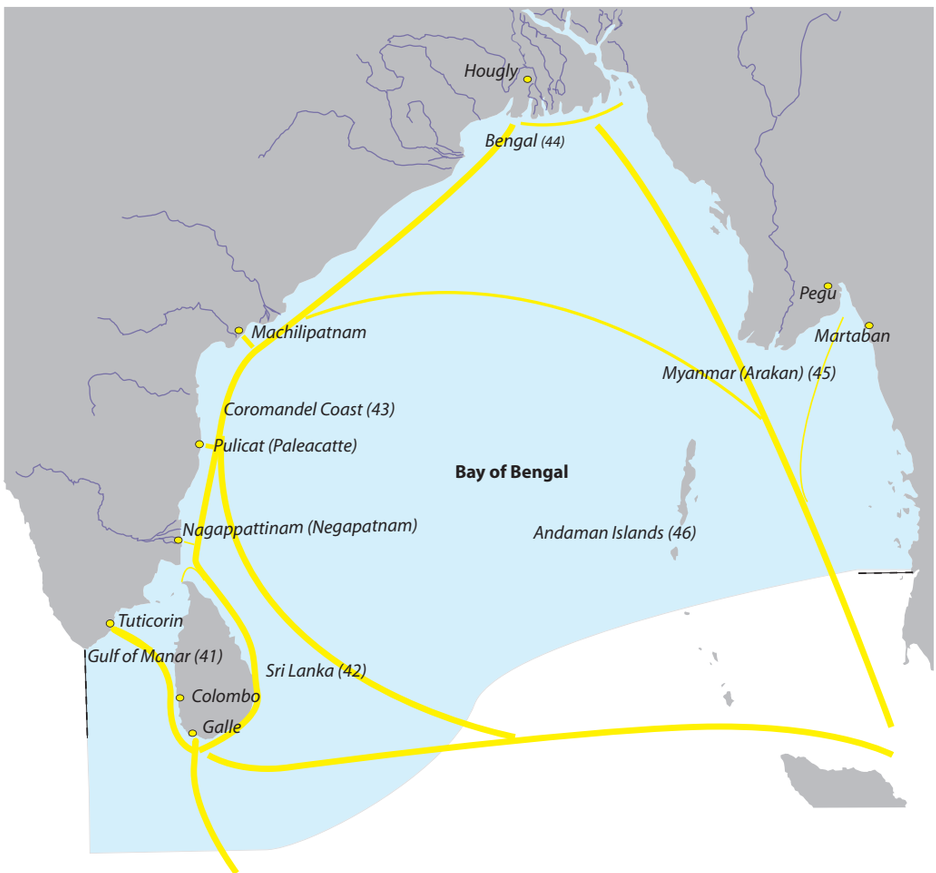
Map 3.2: The north-eastern region, indicating the shipping routes

The VOC followed an aggressive policy trying to break into the Chinese market. Confident due to the VOC successes at Banda, Coen dispatched a heavily armed fleet to the Far East. However, a raid in 1622 at Macao failed completely. Eventually, the VOC could do no more than try to set up a blockade at Macao and launch some scattered attacks on other locations on the Chinese coast. In 1624, a large Chinese fleet surrounded the established VOC stronghold on the Pescadores. The superior strength of the Chinese forced the VOC to move their centre of activities in this region to Taiwan (Formosa) from where the VOC continued their attempts to take part in the Chinese trade. In 1632 a last unsuccessful attempt was made to defeat the Chinese navy. Taiwan served for a substantial period as an indirect link to the Chinese market although officially the Chinese forbade this. However, supply was unreliable and subject to the vagaries of the political situation in China. Changes in the Chinese regime eventually forced the VOC from Taiwan in 1662.

From 1620 the Dutch gradually gained great economic strength through their position in Japan. Apart from a short period between 1629 and 1633, when the Dutch were in conflict with the Japanese authorities on account of Taiwan, the VOC was privileged above the other European nations. After the Tokugawa dynasty isolated itself from the outside world in 1639, they were the only Europeans allowed to trade with Japan. The Japanese authorities prohibited their people to travel to other countries. They were afraid that Japanese society would be contaminated by foreign (i.e. Christian) ideas. Since Chinese traders were also obstructed in both Japan and China, the Dutch were virtually the only foreign traders with access to Japan, under extreme restricted conditions (were confined to a artificial island off Nagasaki, Deshima). Japanese silver, copper and gold were important products on the Asian market and the Dutch had an advantage over their competitors in that they did not need to transport all these precious metals from Europe for trading purposes[13]. Japanese precious metals, traded for silk and luxury items, were used to purchase textiles from India; these formed the most important bartering products for pepper and spices. This system formed a very lucrative profit cycle even though the Dutch did not control prices on the Japanese market.

The situation in the western region

The western region is comprised of the important trade area of the Bay of Bengal with the Coast of Coromandel on the east coast of India and Ceylon in the south. The second important part of this region includes the Arabian Sea, the west coast of India, Surat and destinations in Persia and Arabia.



Map 3.3: The western region: Bay of Bengal, indicating the shipping routes.

Textiles from India were of substantial importance when bartering for many products in Asia. The earliest lasting contacts were on the Coromandel Coast where the influence of the Portuguese was not as strong as on the west coast. Trading posts around India were established from the early 17th century including a long strip along the Coromandel Coast where the VOC established various trading posts and strongholds to secure trade. The important textile factory on the northern coast in Masulipatnam was established in 1605. The VOC Governor for the Coromandel had his residence in Palecatte (Pulicat) on the south coast, which also served as the VOC headquarters for the region until 1690. The Dutch had to fight many European competitors to protect this essential trade. An almost constant state of war with the Portuguese prevailed. This and the internal conflicts between the local rulers, forced the VOC to organise their trade from strongholds like the fort Geldria in Paleacatte, built in 1613 with the consent of the local ruler. The town and the fort of Nagapatnam were captured from the Portuguese in 1658. The ramparts and most of the houses were destroyed in 1680 by what might have been a tsunami. The VOC built an impressive fort on the ruins and this became the new headquarters for the VOC presence on the Coast after 1690. The military action of 1658 organised by Van Goens[14] as military commander in the region finally removed the Portuguese from Ceylon, and reinforced the VOC's position on the Coast of Coromandel.

Another important centre for textiles in this region was Bengal, located on the delta of the river Ganges. The Dutch had already explored Bengal for trading purposes in 1607, but it took until the late 1620s before the VOC established trade relations there on a large scale. The Mongols, the rulers of Bengal, granted the European companies trade concessions. Once in position, it was important for the Europeans to maintain diplomacy in the form of embassies to the Great Mongol. Since 1634, the VOC had established itself deep inland in Chinsura near Hooghly. It was very difficult for larger ships to reach this place. Apart from textiles, other important commodities were silk, opium and sugar. Saltpetre was a key raw material for the production of gunpowder and was also used as paying ballast. The VOC managed to get a foothold in Arracan (the modern Myanmar) after 1620. The VOC exports from this area were mostly slaves and rice.

Although several attempts were made in the earlier period, it was only in the 1630s, that the VOC considered establishing a land-based military operation in Ceylon. Until then, the VOC could not do much more than patrol and capture Portuguese ships in the region around Galle. In 1638, a contract was signed between the King of Kandy, Radja Singa, and the VOC for military assistance in removing the Portuguese from Ceylon. As a reward, the VOC were to get trade privileges. Trade items controlled by the King, like elephants and cinnamon, were to cover the expenses of the military operation. The Dutch finally succeeded in capturing Galle from the Portuguese in 1640. During the 1640s and '1650s the VOC was able to take control of the coastal area from the Portuguese. Radja Singa had hoped to remove or take over the Portuguese fortifications, but the Dutch retained them as a pledge against the payment of expenses. That proved of course to be a two-edged sword, since the debt was set at so high a price that the King was by no means able to meet it. Very disappointed, Radja Singa had to conclude that the assistance by the Dutch in regaining authority over the coastal areas of Ceylon had changed nothing for Ceylon other than the nationality of the occupier: they had simply replaced chilli for ginger!

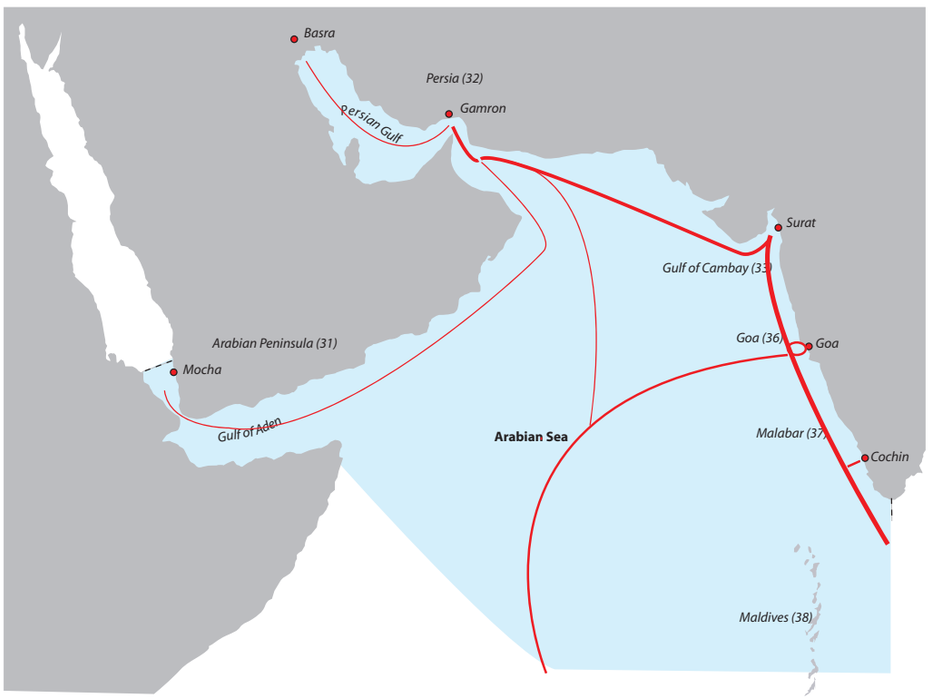
Ceylon played an important role in regional trade and shipping. For some years in the second half of the 17th century, when a direct shipping link was operative with Euorpe, Ceylon was also able to play an intercontinental role under the dynamic leadership of Rijcklof van Goens Sr. This direct link reflected the central role of Ceylon in the trade of Coromandel, Surat, Arabia and Persia.

In their search for textiles, the VOC also expanded their activities to the other side of India. The Portuguese had their powerbase in this sector and establishing trade connections was therefore more of a risky business for the VOC. In Surat in the north (around the modern Gujarat), they could only do so with the permission of the local ruler, the Great Mongol. This centre for textiles had already been visited in 1602, but it took until 1617 before the VOC was able to set up a trading post there. Once again, diplomacy was essential to retaining the trade concessions and reinforcing the VOC's position against other competitors. During the 1620s,

the merchant Francisco Pelsaert, stationed in Surat and Agra at that time, and a man who apparently understood the importance of correct protocol, wrote to the VOC recommending luxury items to send from Europe. He observed the surprise by the rulers that the VOC had gold and silver manufactured into articles that were in common use in India:

> 'It would be well therefore, for the first trial, to manufacture such goods as the following to the value of 8000 to 10000 reals-of-eight, and to the same amount in gold: feet for kettles, or bedsteads, hollow, and as light as possible, but artistically wrought. Aftabas, or ewers used by Moslems for washing their hands. Betel boxes Fan handles, handles for fly-switches. Dishes and cups with covers. If necessary, the style or fashion of these items should be explained' (Green 1989).

After returning to the Netherlands, Pelsaerts advice was followed and with the fleet of 1628, a fine collection of this type of articles was sent. Due to the wrecking of the *Batavia* on the west coast of Australia a part of these valuable items never reached India.



Map 3.4: The western region: Arabian Sea, indicating the shipping routes.

The traditional centre for trading connections with Europe, the Asian Silk Road, was in the far west of the VOC's trading area in Asia. Persia was still important for its silk, but also for bullion obtained by selling pepper and spices. The money was used by the VOC to trade in Asia. Trade in Persia presented a dilemma because the spices used for barter by the VOC and other traders were likely to create competition with the VOC's own spice exports to Europe; they had found their way to the European market over the traditional land route long before the sea route was opened. The VOC set up a post in Gamron (Bandar Abbas) in 1623. The English in particular were very active there and were often a threat to the VOC.

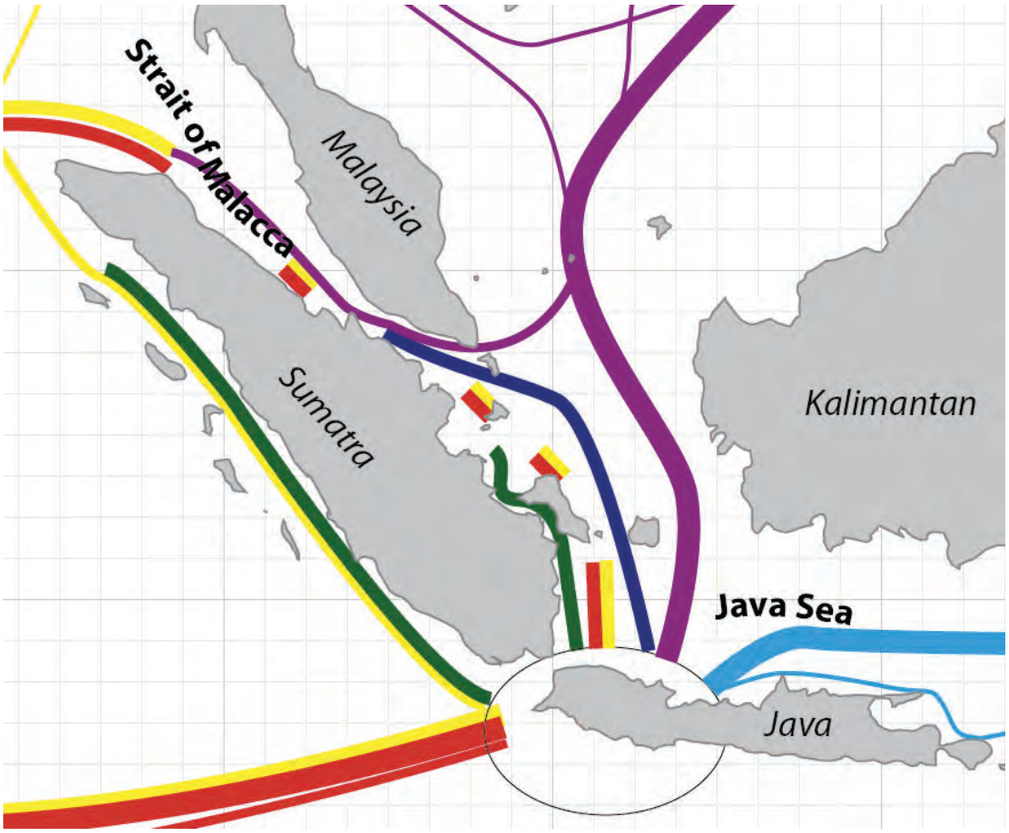
In the extreme west, the VOC established a small trading post at Mocha on the south-western tip of the Arabian Peninsula. In the early days, the VOC traded spices for precious metals from Europe, although reluctantly. During an early visit to Mocha in 1616, the VOC official Pieter van den Broecke advocated that the supply of money the VOC used for trade purposes be sourced from this region instead of being shipped around Africa via the Cape of Good Hope. He also described a local specialty: '*Kahauwa,* a kind of black bean / resembling *Boontje-Holwor-*

tel / of which they make black water / that they drink (Commelin 1646c, p. 33). It was only at the end of the 17th century that coffee became an important commodity from this region.

From the 1620s onwards, the VOC assembled an impressive military force of big heavily armed ships in the Arabian Sea aimed against the Portuguese. After 1636, the VOC added their annual blockades of Goa to this highly militarised situation. There was a constant risk of confrontations with heavily armed Portuguese (and later also English) vessels. Visiting vessels therefore needed to be heavily armed or escorted by another defensible vessel. Although the VOC was not able to expel the Portuguese from this region, they were able to a large extent to frustrate Portuguese trade and shipping.

After the military successes of Van Goens on the east coast, the VOC focussed on the west coast of India The Malabar Coast was believed to be a threat to the VOC in Ceylon if the Portuguese used it as the base for operations to recapture Ceylon. Pepper was the prized commodity there. Eventually, after several military actions the Malabar Coast was brought under VOC control in 1663. The main trade post was in Cochin, but along the coast various fortifications were constructed. A position on the Malabar Coast pepper market meant that the VOC was less dependent on Indonesian and Malaysian pepper producers.

Strait of Malacca

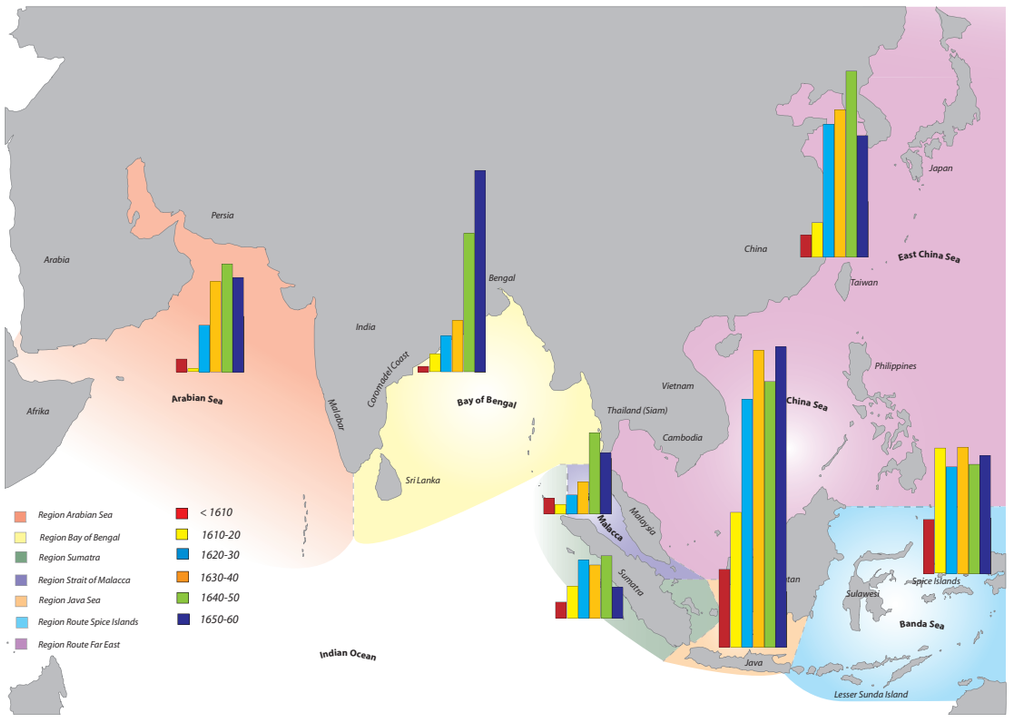


Map 3.5: This map shows the strategic location of the Strait of Malacca in the intra-Asian network

Due to its highly strategic position, the area of Malacca warrants separate attention. Right from the start of Dutch shipping in Asia, the Strait of Malacca was an important military destination being the main connection between the Far East and the Indonesian Archipelago on one side, and the Indian Ocean on the other. The Sunda Strait, the second important connection, was

already under VOC control from the 1620's. Controlling both seaways was an important aim for the VOC. Initially, the VOC was able to build alliances with the Sultan of Johore who was driven out of Malacca by the Portuguese. In those early days military confrontation involved the use of large ships whereas in later years, this changed to patrol activities to disrupt traffic and capture smaller vessels for the booty they carried. After 1640, when Malacca was taken over from the Portuguese, the VOC tried to re-establish an international trade and shipping centre there. This policy was difficult to combine with the VOC's ambition to gain a monopoly over the pewter trade from the local rulers. However the producers of pewter managed to evade contracts that would result in a shift of control to the VOC.

The general development of the Asian shipping



Map 3.6: General development of VOC shipping (frequency of arrivals per region) to 1660

From the data in Table 3.1 graphically shown in Map 3.6, the development of the total shipping network can be seen. In the period under consideration, 33% of all the arrivals (and 29% of the total cargo space involved) of VOC intra-Asian voyages took place in the region around the Java Sea with Bantam (only in the early years) and Batavia, as the most important ports. This region was pre-eminent in inter-Asian shipping. The tables also show the central role of this region in the intra-Asian network. A constant growth can be seen in the arriving shipping volumes in this area over the whole of this period, indicating a complementary increase in the stock of Asian goods available in Batavia for transhipment to Europe.

Throughout this period the Spice Islands were an important destination as one of the core businesses of the VOC as well. Ambon (area 85), Banda (area 86) and the Moluccas (area 88) together represented almost 16% of all arrivals and the total shipping volume. The region shows some fluctuation in the numbers of visiting ships and their cargo space because of the effects of large military actions in some periods, but is otherwise consistently high during the period 1610 to 1660.

For other regions, like the important pepper ports on Sumatra (areas 51, 52 and 53), the increase in shipping is clearly visible during the VOC's development phase. Shipping to other destinations like the Arabian Sea and the Far East emerged later in the process, but was already in some decline in the last 10-year period under consideration. The growing importance of the Bay of Bengal (VOC's "vette weide" – the plentiful pastures) is clearly shown, by the numbers of visits and volume amounting to nearly 20% of total VOC shipping in Asia during the last 10-year period.

Besides developments instigated by trade, other aspects such as a military emphasis on a region are also reflected in Tables 3.1 and 3.2. Changes in the arrivals and volumes of shipping to the Strait of Malacca (area 61) are indicators of changes in the nature of the shipping. When the VOC intensified its attempts to ban Portuguese shipping through this important link between the Far East and the Indian Ocean around 1630, they sent smaller, well-armed yachts to this region. Table 3.1 shows the frequency of arrivals in this region increasing rapidly, but there is a decline in the average tonnage of the ships to around 77 last in the 1620s and the 1630s, and even in the absolute shipping volume arriving in the area (as can be seen in Table 3.2) After 1640, when the situation had stabilised, the average tonnage again increased to values around 155 last in the period between 1640-1659.

Although the general issues can be clearly seen, a more detailed analysis will reveal much more of the way the VOC shipping in Asia developed during the first half of the 17th century. The quantitative part of this detailed analyses will be given in part two.

Intra-Asian shipping to 1660 Frequency by region	Period						
Region	<1610	1610-20	1620-30	1630-40	1640-50	1650-60	Total
Arabian Sea	38	8	139	268	320	280	1053
Bay of Bengal	16	51	106	152	410	597	1332
Sumatra	48	95	172	158	185	92	750
Strait of Malacca	46	28	56	95	224	181	630
Java Sea	231	400	736	880	789	891	3927
Route Spice Islands	161	371	317	375	324	350	1898
Route Far East	66	102	394	437	552	366	1917
Total	606	1055	1920	2365	2804	2757	11507

Table 3.1: Development of VOC intra-Asian shipping to 1660 in arrivals at main regions over 10-year intervals.

Intra-Asian shipping to 1660 Volume by region	Period						
Region	<1610	1610-20	1620-30	1630-40	1640-50	1650-60	Total
Arabian Sea	10650	1205	34629	64330	70724	53900	235438
Bay of Bengal	2625	6180	14861	19542	70268	91589	205065
Sumatra	8985	12695	24966	21637	30567	14277	113127
Strait of Malacca	12405	5440	4276	7510	34405	28456	92492
Java Sea	44645	70583	104652	122171	149934	165847	657832
Route Spice Islands	31964	85412	51923	40468	52160	53247	315174
Route Far East	13610	19430	61586	70277	101279	63220	329402
Total	124884	200945	296893	345935	509337	470536	1948530

Table 3.2: Development of VOC intra-Asian shipping to 1660 in volume (in last) at main regions over 10-year intervals.

4

Connecting the Asian regions: The trading and shipping network in operation after 1620

Introduction

After the period of 'round trading tours', a network of regular shipping gradually developed in the various regions in Asia. In 1619, Batavia in Java became the centre for shipping. It was the traffic control centre for most shipping in Asia and the main connection between the European management and the Asian branch of the VOC. Shipping was dependent on the seasons of the monsoon. The following sections describe the development of the Asian shipping network as the various shipping configurations were adjusted to the requirements of the weather and other conditions. It was sometimes very difficult for the VOC to regulate the connections between the many shipping routes spread out over a large area. In some cases, a ship delayed for only a short time could have major consequences for the organisation if a connection on a route subject to a specific monsoon season, could not be made; for instance when important products like textiles from India could not reach Batavia in time to be shipped to the Spice Islands where they were significant items for barter. Another difficulty was created if ships were delayed for months while waiting for a change of season and could not be employed on other routes. These problems do not appear to have been fully appreciated by the power holders in the Netherlands. Already in 1634, Governor-General Hendrick Brouwer had to explain to the VOC Directors in the Netherlands the importance of the timely departure of ships in order to be able to make the connection with the most prominent shipping routes in Asia:

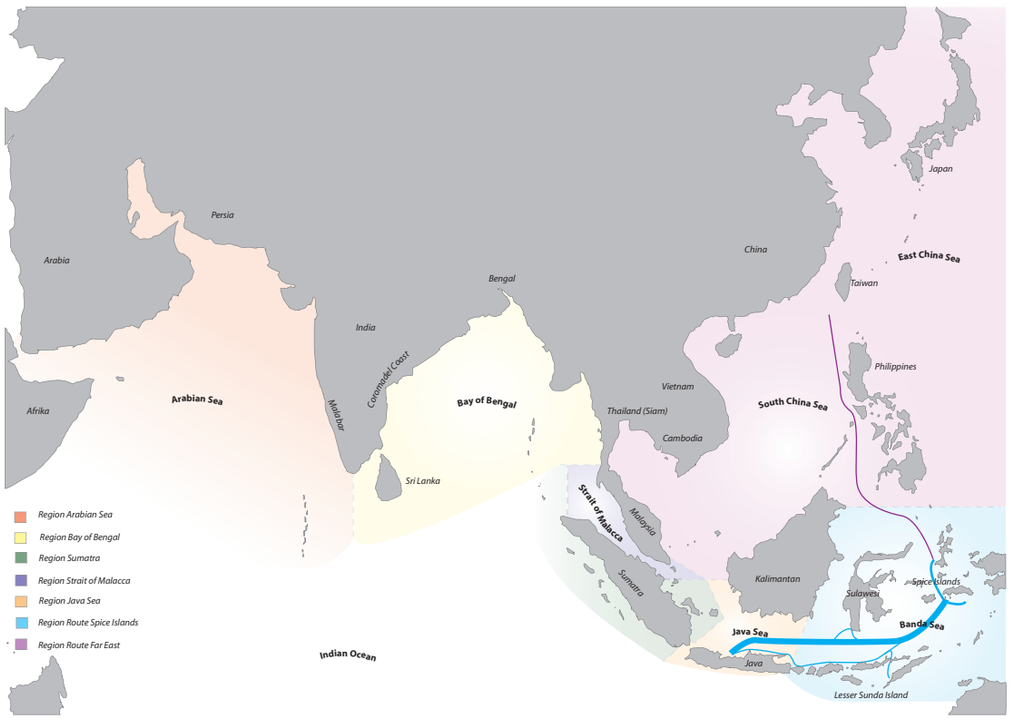
> The money and cargo [from the Netherlands] that is meant for China and Japan should arrive here [Batavia] in the month of May. The commodities for Coromandel, Persia and the Surat are to be sent at the beginning of July and therefore, also because these trading posts are drawing most of the money and other means, [we] request Your Honour to send us these with the ships departing in the autumn that is before the winter from Your Honour, because otherwise these delayed arrivals means a fruitless stay with us for a year (Colenbrander 1960, p. 456).

Ships departed and arrived to and from Europe at regular intervals. Fleets of VOC ships left the Netherlands for Asia around New Year (the so-called Christmas fleet), and at the beginning of the spring (the so-called Easter fleet). Departures from Batavia to Europe were around New Year (December-January). Running the shipping through Batavia was first and foremost a management control issue since, for ships to call at Batavia was not always the most practical strategy. Ships could follow various main routes for voyages within Asia to or from Batavia, depending on the season and sometimes on the type of ship. Over the years, the VOC succeeded by trial and error in designing a shipping network that ensured an efficient year-round deployment of ships to various destinations.

The main routes in Asia

The eastern route: the Spice Islands

The Eastern Route stretched directly east from Batavia to the Spice Islands. The three important destinations on this route were the island groups of Banda, Ambon and what at that time was called Molucca. In this period, only Ternate, Tidore and a few neighbouring islands were referred to by this name by this as opposed to later definitions of Molucca, or the Moluccan Islands. From the centrally located Ambon, it was usually possible, though in some periods rather difficult, to reach both other destinations. The route from Batavia to Ambon, however, was the most monsoon-affected of all the VOC shipping lanes.



Map 4.1: The Eastern route to the Spice Islands. The route was connected with the route to the Far East along the Philippines (the purple pine).

It was only possible to sail from Batavia to Ambon from October to March. This applies not only to the larger Dutch cargo vessels, but also to smaller ships, whether of European or Asian construction. Ships leaving Batavia in March or even at the end of February often failed to make the voyage and had to return to their port of departure. From April to October, ships returned to Batavia with their cargo of nutmeg, mace and cloves. All types of vessels were used by the VOC on this route. Normally, the voyage was not dangerous for the larger ships with regards to weather conditions or attacks from enemies of the Company. The only navigational risks were the very steep shores of the islands and the reefs with nowhere suitable to anchor in adverse winds, or currents to prevent stranding. Because the skippers expected little danger on this easy route between Java and the east of the Archipelago, accidents often happened due to inattention. The ship *Hollandia* (ID:237) whose fate is described in detail in a report in the VOC archives is a case in point. This large *retourschip* sailed to the Spice Islands in 1642 with an accompanying smaller vessel and was wrecked on a reef near Lombok. The loss

occurred during excellent weather on a clear night and it seemed to have happened, 'as if no person was keeping watch' (NA 1.04.02, VOC 1142, fol. 9).

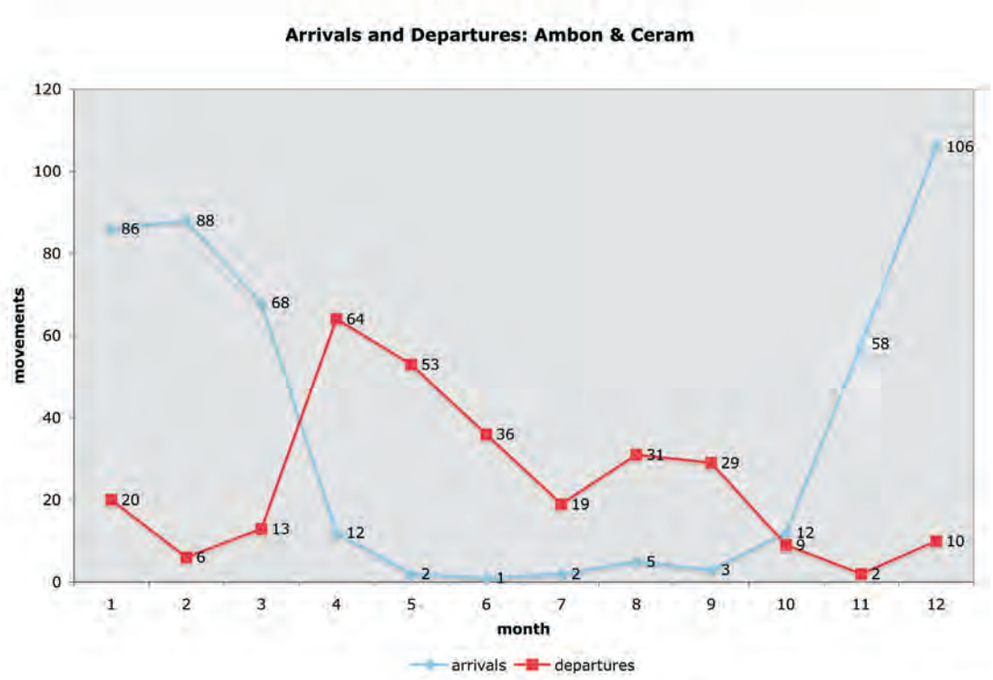


Fig. 4.1: Shipping in the Spice Islands Region: Average arrivals and departures from Ambon and Ceram per month for 1595-1660

The VOC often used worn out *retourschepen* for the journey to the Spice Islands; ships that were determined unfit for the return voyage to the Netherlands. Apart from these ships, a number of middle-sized, small and even very small vessels (sometimes just open boats) sailed from Batavia every monsoon (see chapter 5). To protect the VOC's clove trade from what the Company considered to be smuggling, a number of small vessels in good condition and heavily armed for their dimensions, which could be rowed if necessary, were used to fight local ships. They were also used to transport some of the soldiers and their possessions to the Spice Islands. Most of the troops, however, were transported to the Spice Islands on the large ships. Because the VOC tried to prevent foreign merchants from trading with the Spice Islands, the Company had to provision itself, so the larger VOC ships also had to carry substantial amounts of rice and other food products.

Only part of the cargoes carried on this Eastern route can be considered genuine intra-Asian trade. Most of the spices brought to Batavia were exported directly to Europe. A portion, however, was used by the VOC to trade with the rest of Asia. On their outgoing voyages from Batavia, the ships transported foodstuffs and utensils for VOC employees, soldiers, slaves, also for the other people on the islands. Most of these commodities were imported by the VOC from other parts of Asia, but also a large quantity of European meat and wine barrels were shipped to the Spice Islands in every west monsoon period. The textiles transported eastwards from Batavia were mostly intended to be traded for cloves, directly or indirectly. An interesting aspect is that the VOC itself generated intra-Asian trade, for example by using Asian pottery for storage instead of European built wares. Instead of wooden barrels, the VOC stored water and powder on the Spice Islands in *martabans (stoneware storage jars)* imported from ports in the Bay of Bengal, and which were in use there by the local people.

On this eastern route, only a few intermediate ports were of importance to the VOC. Some ships visited ports in Java, Bali or Macassar on their voyage from Batavia to the Spice Islands to buy food (mostly cattle from Bali and rice from Macassar). Trade products from these places

were of very little importance and ships very seldom made a direct return trip between these places and Batavia. Due to the smuggling trade, the relationship with Macassar was often tense and as a result this region became an occasional destination for military operations.

The only independent destinations on the eastern route for VOC ships, were the islands of Timor and Solor. At nearly every monsoon, one or two yachts sailed to these islands to buy sandalwood, an important trade product for the Asian mainland, and returned directly to Batavia. Local political and geographical circumstances meant that the VOC ships had to collect the sandalwood themselves near the areas were it grew. Vessels needed to be medium-sized and easily manoeuvrable for this trade, as the places from where the sandalwood was shipped were often on dangerous lee-side shores. The VOC tried to establish strongholds for themselves, first on fort *Henricus* on Solor and later fort *Concordia* on Timor, but they gave up on this policy because the local traders could not be persuaded to bring the sandalwood to the trading posts.

VOC ships regularly visited ports on central and western Java for provisions and building materials for Batavia. This required a number of ships of different sizes; sometimes with the ability to load long wooden logs, but these ships were usually utility vessels rather than trade vessels from the network.

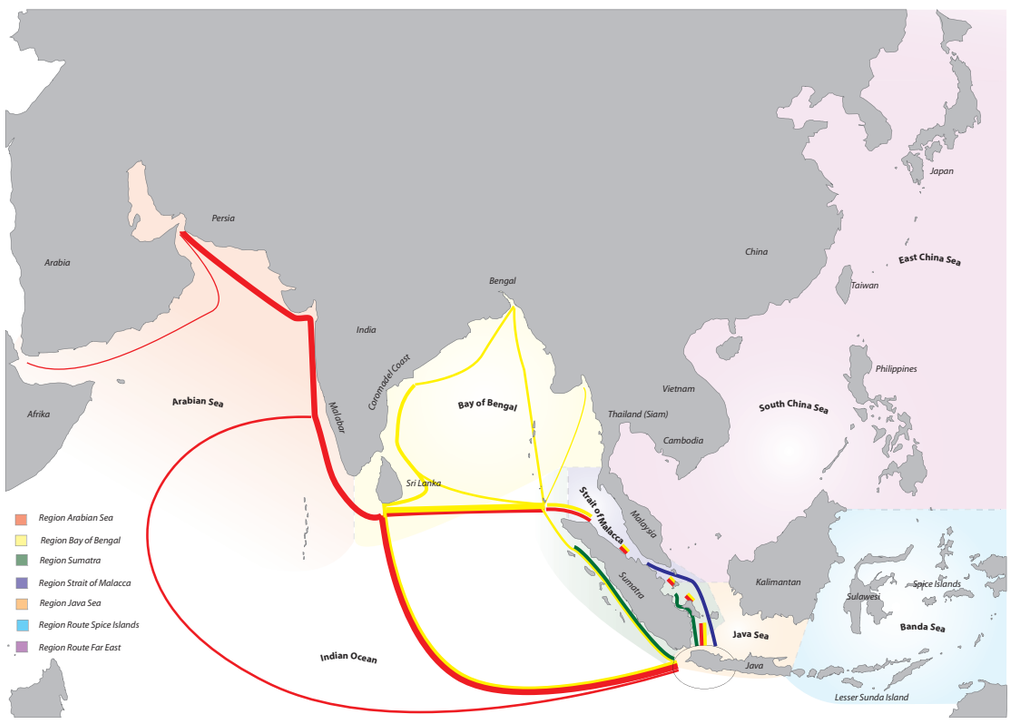
There was a link with the north-eastern route to the Far East by way of the VOC ships deployed for a military action. From the Moluccas, they attempted to intercept the Spanish ships around the Philippines carrying supplies and soldiers to the Spanish allies in Tidore. The VOC also tried to intercept the Spanish silver galleons arriving in the Philippines from Mexico. They were, however, unsuccessful in this mission. Throughout the whole period of Dutch-Spanish warfare not one Spanish silver ship was captured in this region. In some periods a number of heavily armed ships left the Moluccas for this destination around January/February. After their activities in the region between the Moluccas and the Philippines, these ships would sail further north. Here they tried to intercept Chinese junks travelling to Manila. The VOC was much more successful in these actions and large quantities of Chinese products entered the VOC trade system in this way. Small amounts of cloves were also brought to the Chinese market in these ships. Weather conditions made this voyage a lot more dangerous then the eastern spice route. Larger ships in good condition were required, not only to withstand weather conditions, but also to resist assaults from Spanish ships which were much more powerful then those of the Asian enemies the VOC encountered around the Spice Islands. Before 1630, these ships sailed on to Japan on a regular basis where they could sell the captured trade items and wait for the change of the monsoon. In the second half of the period covered here, that base moved to Taiwan because entry to Japan had become restricted.

The north-western route, Branch A

The VOC's north-western voyages during this time were influenced by the military conflict with the Portuguese in the Arabian Sea. Naval expeditions to the area commenced in the 1620s with some being undertaken in conjunction with the English. Later, more attention was given to the blockade of Goa. From 1636, the VOC sent a large, strongly manned and armed fleet to the Indian west coast nearly every year. The Portuguese port of Goa on the west coast of India – the centre of their Asian administration – was highly monsoon-dependent. Between April and September, this coast had a very dangerous lee shore where hardly any shipping was possible, making the blockade of the port of Goa only worthwhile in the period from September to April. In order to be effective, Dutch ships had to be near Goa at the earliest possible occasion. Because it was difficult to sail northwards through the Strait of Malacca just before September, these ships would sail through Sunda Strait and search for the most favourable winds in a long curve over the Indian Ocean. After a first fleet had arrived in Goa travelling through Sunda Strait, other ships would arrive later in the season at Goa by way of the Strait of Malacca. From late September the passage to the Indian Ocean was much faster following this route than it had been through the Sunda Strait.

This blockade was the only place in Asia where, after 1620, the VOC could expect to have to fight a full-blown battle with another European fleet and therefore they had to deploy a strong blockade fleet. Combining this with trade activities in this region could reduce the cost of the blockade. The extensive expenses were justified by the VOC by the damage caused to the Portuguese supply of Asian products to Europe, which, it was believed, would ultimately benefit the VOC through higher prices on the European market (Coolhaas 1964, p. 144).

These circumstances meant that after the arrival of the fleet in Goa, a number of VOC ships could be used for trade, depending on the strength of the Portuguese fleet and the judgement of the Admiral of the blockade fleet. In addition to the stores and armoury needed for the blockade, some trade products were usually carried by the fleet as well. Normally, shortly after the fleet arrived in Goa, these goods would be sent on one or two ships to Surat, the most important port in north-western India, where the VOC had a factory. Trading ships sailing on to Surat or Persia had to be strongly armed to be able to resist the Portuguese still operating from many strongholds in the area. Indeed, the VOC lost one richly laden ship – *Franeker* (ID:648) described as a warship, but too lightly armed to sail alone in this area – in a Portuguese attack (Colenbrander 1900, p. 249). From December to May, shipping along the Asian coast between Surat and Persia could be carried out in both directions. VOC ships travelled this route with products from other parts of Asia, and also as traders between these ports, even regularly transporting freight for local traders or authorities. From Persia, some VOC ships would sail on to Mocha in Arabia, where coffee (*quawa*) was already a trading item, though not yet a very important one. More important for the VOC were Persian silk and Surat cloth. At the end of the blockade, some ships were sent to the Indian coast in the neighbourhood of Goa to buy rice and pepper. Good profits could be made by first sailing to Surat to buy *amphioen* (opium) and then trading this for pepper on the Malabar Coast of South India.



Map 4.2: The north-western routes, Branch A & B

Ships returning from Persia directly to the Sunda Strait often had great difficulty in finding favourable winds which meant that voyages to Batavia could take as long as five months. A more efficient route was to first cross the Arabian Sea to its eastern shore. Ships sailing along the Indian and Ceylon west coasts could approach Galle nearly all year round, since this port

was on the only east-west oriented coast in the region and thus independent of the monsoon. In the early 1640s, Galle was unable to play a logistical role in the shipping network, as the fort city was completely isolated from the surrounding area. Even basic supplies such as rice had to be brought in by passing VOC ships. In this period, however, Galle was used as a transit port for some goods; for instance, Persian horses, which were not able to make the long voyage to Batavia in a single trip, would have a rest and recreation stop there while their ship sailed on. By the end of the 1650s, Galle had gradually built up its logistical role in the shipping system.

Batavia could be reached from Galle or South India along the west coast of Sumatra, through the Sunda Strait in generally little more than a month. During some months of the year, vessels in poor condition chose the longer but more sheltered route through the Strait of Malacca. There was one other Asian area frequented by VOC ships that had to be reached through Sunda Strait, the pepper ports on the west coast of Sumatra. Commerce had a totally different character here from that described above. Trade was simple, only involving two products, cloth for pepper, but was dependent on the good will of the Sultan of Atjeh who dominated the whole region. Portuguese or other Asian adversaries were hardly present, so the ships did not need heavy armaments. Ships of intermediate size and good cargo-carrying capacity were needed to gather the pepper from the different ports along the coast and take it back to Batavia. Some VOC ships, often flutes, were almost continuously engaged in this trade.

The north-western route, Branch B

Sailing in a northerly direction through the Strait of Malacca was not entirely limited by the monsoon. It was always possible to pass through the Strait but during the adverse monsoon period (going north this was from around February to September), the voyage could take a long time and Branch A was preferred. Ships with a destination in the Bay of Bengal had to observe certain aspects of the wind and current patterns after leaving the Strait of Malacca in order not to end up on the wrong side of Ceylon and miss the entrance to the Bay of Bengal. It was possible to arrive at, or leave from the ports in the Bay of Bengal almost during the whole year, but direct sailing from one port to another was only safe at certain times and in certain directions. Normally Pipelij, the northern-most VOC base in the Gulf, had to be reached before December to take advantage of the favourable wind conditions.

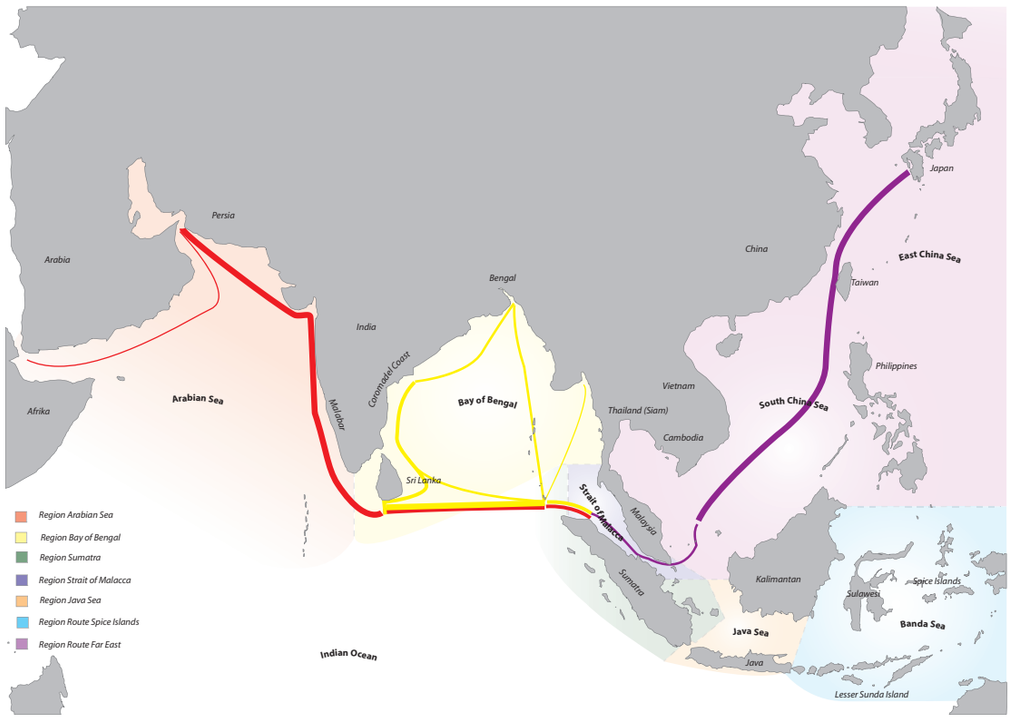
The situation with regard to trade was somewhat different here compared to the other side of the Indian subcontinent. On the west side, there were two important trade ports for the VOC, Surat for northern India and Gamron for Persia, where goods were brought overland from afar. On the eastern coast there were a large number of ports each with their own trading products. Each location would have locally specific patterns printed on. Besides the larger ships transporting substantial quantities of cloth and saltpetre to Batavia, smaller ships were also needed to collect these goods. The sequence of obtaining and transporting gold, silver, other metals and ores and some spices with which to buy these commodities was very important. For the most eastern ports in the Bay of Bengal, called Arracan and Pegu by the VOC (modern Myanmar), it was difficult to apply the system because the period when ships could go there in combination with other destinations was very limited. Consequently slaves and rice, which the VOC bought there, were often taken directly to Batavia.

VOC ships visited all the other ports during voyages up and down the coast, from the mouth of the Ganges in the north to Ceylon in the south, even though they had to be careful near places under Portuguese influence. Trade depended on a large number of local coastal rulers with these frequently being governors representing greater kings living further inland. Most of the ports had local traders and shipping operating concurrently with the VOC. The danger of interference from large, armed Portuguese ships was much less on this coast than on the western side of the subcontinent.

A number of VOC ships sailed from Bengal to transport sugar and tropical products to Persia. Because of the VOC's positive trade balance there (after a problematic start), the ships returning after 1640 to the Coromandel Coast and Bengal often carried gold and silver coins. Although these ships did not always sail into the bay of Galle, they nearly always tried to

establish communications there, underlining the strategic position of Galle in the trade and shipping network.

Shortly before 1640, the VOC established a connection between the north-eastern and the north-western routes. Around December, some ships returning from Japan and Taiwan would not sail to Batavia but would travel directly through the Strait of Malacca to the north instead. Some of these ships were expected to report to the Goanese fleet around January to be escorted through Portuguese spheres of influence and to redistribute cargo for Surat or Persia. Others had orders to sail directly to the Coromandel Coast. Japanese silver and copper, Chinese gold and porcelain and sugar were their most important cargoes. From the Coromandel Coast, these ships would join the other VOC ships trading in the region and then return with them to Batavia. There was no direct VOC trade in the opposite direction through the Strait of Malacca to China, as the Portuguese had carried out with their annual shipping from Goa via Malacca to Macao.



Map 4.3: The connection between the routes to the Far East and the North-West after 1640

The developing complexity of the trade and shipping network between these regions illustrates the flexibility of the VOC in utilising their ships to the fullest extent and keeping them sailing, in contrast to the Portuguese who often left ships idle in Macao, waiting for a change of season.

It is interesting to note that the VOC seemed to be the only partner who could transport and safely store large amounts of gold and silver along all the ports mentioned above. Local rulers in all these places knew that it was not wise to allow any major theft to take place, even if it was in the guise of robbery by bandits, because the VOC was able to take retaliatory action in the whole area. The VOC was therefore effectively able to capitalise on the exchange differences between gold and silver values and between different kinds of coins, by transporting large amounts of these currencies. The transport of the right kind of bullion to the right place was a permanent concern for the VOC traders (see Case Study 4-1).

Like Branch A, Branch B also included a pepper route to Sumatra. VOC ships visited the south-eastern coast of this island to exchange cloth for pepper. Trade here was in some ways different from that on the west coast of the island. Most of the centres for the pepper trade were situated inland and connected to the sea by rivers. The VOC often kept some smaller ships on

the rivers to transport the pepper down river to larger ships anchored outside the shoals that abounded on this part of the Sumatran coast. In this way, even the large *retourschips* could sail to Jambi to collect pepper in the interval between their arrival and the departure of the fleet back to Europe.

Between 1620 and 1640, many smaller vessels were sent to the Strait of Malacca to assist in securing all the waterways of the region for the VOC. The places and dates for ships to be present in this region were dictated by the possibility of intercepting Portuguese vessels, so the VOC fleets moved up and down the Strait of Malacca to the rhythm of the monsoon.

In 1641, the VOC took over the city of Malacca after a long siege with the Portuguese. The city then became a stopover for almost all VOC ships sailing through the Strait. Although Malacca did not reach the same status as an important emporium that it had under the Portuguese, it was still an important location for the storage and redistribution of stock. As far as intra-Asian trade was concerned, Malacca became a VOC centre for the pewter trade in this region and an independent destination from Batavia for pewter and pepper.

Case Study 4-1; Two examples of VOC currency exchange
The VOC was able to implement an active exchange policy of currency as is demonstrated in the following instances where the differing value of gold and silver in the region is maximised.

'Van Thaiwan door de straete Malacca aff te senden in Japans silver ende Chinees goudt thienhondert-duysent guldens, mits dat in 't versenden des gouts by scharsiteyt Coromandel prefereren ende des te meer silver nae Suratte schicken, alsoo 't gout meer in Masulipatnam als Suratte rendeert'

Send from Taiwan, through the Strait of Malacca the Japanese silver and the Chinese gold worth ten-hundred-thousand guilders. The gold to Coromandel, if due to the scarcity, it is preferred there and thus extra silver to Surat, because gold yields more in Masulipatnam then Surat (Coolhaas 1964, p. 37).

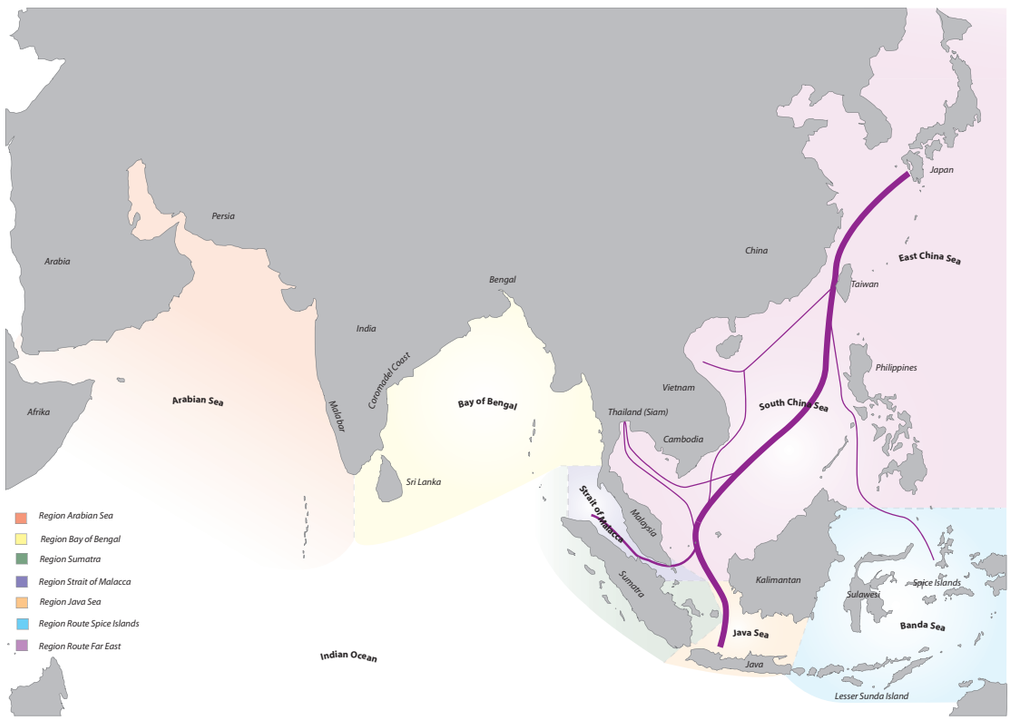
'De wissels aen de Moren in Bengale en op de cust, om op Seylon betaelt te worden, is een goede sake, maer het verschil van de reductie der pagoden en het verlies, dat mitsdien op Seylon geleden wort, is te groot. Weshalven de gouverneur besloten heeft van de comptanten, uyt Persia of Suratte voor en ten behoeve van Bengale op Seylon comende, soo veel ropias te lichten, als de wisselbrieven medebrengen, de Moren ropias in plaets van ryxdaelders gevende.

The bill of exchange to the Moors in Bengal and on the Coast [of Coromandel] to be paid on Ceylon is a good practise, but the difference of the reduction of the *pagode* and the loss, that therefore is made on Ceylon, is too large. Therefore the Governor has decided to take from the ready money, that will arrive from Persia or Surat to Ceylon to be used for Bengal, so many *ropias* as required for the bills of exchange, so we can give the Moors *ropias* instead of *ryxdaelders* (Van der Chijs 1893, p. 206).

The north-eastern route

Starting around April VOC ships would leave Batavia in a north-eastern direction, some simply sailing to Siam and back. The old capital, Aythaya, of what is now called the Kingdom of Thailand, was located much higher up the river than its modern equivalent, Bangkok, which in that period was only a toll station near the mouth of the river. Smaller VOC ships would cross the sandbar in front of the river mouth and sail up the river; larger ones would anchor in front of it. There was direct trade, large in volume though small in value (mostly in rice and wood), between Batavia and Siam. Some VOC ships would continue along this route to Taiwan with deerskins and products from the tropical forest (mainly Sappan wood) being their most important cargo. In Taiwan they would find other ships that had sailed directly from Batavia; ships would leave Batavia for Taiwan as late as September.

The special conditions prevailing in Taiwan meant that a great variety of VOC ships were dispatched to this region. The largest VOC ship type was sent to load large bulk cargoes from China and Japan. These ships arrived in the region in July/August, but had to leave before the end of October, for commercial rather than nautical reasons. Otherwise it was very difficult to get the cargo from China and Japan to Batavia in time for the return fleet that left around New Year. The Taiwanese port could however only be accessed by ships with a depth of less than 13 feet. In addition, the road in the Dutch settlement at Taiwan was dangerous because of foul weather during the part of the year when the ships were there. To overcome these difficulties, larger vessels were loaded with the cargo collected from the Chinese traders during the year in Taiwan and then transported during September-November to the roadstead near the Pisca-dores Islands. This transport system required a large number of cargo ships of different sizes. Some yachts assigned for military functions in this region could also carry cargo, but their armaments and construction hampered their usefulness. Captured Chinese ships were also pressed into service by the VOC, as were other Asian-built ships that were bought or hired in the region. In VOC correspondence they are all called *jonken,* which does not necessarily mean that they were all of the type now known as junks. It is remarkable that of a fleet of five VOC ships sailing together to the same destination near Taiwan, the three so-called *jonken* had pre-dominantly Chinese crews, whilst there were no Chinese crew on the other two (Blussé, Milde & Ts`Ao Yung-Ho 1995). *Jonken*/Junks sometimes carried cargo between Taiwan and Batavia or Siam, but were mostly utilised around Taiwan itself by the VOC.



Map 4.4: Route to the Far East

The north-eastern route did not end at Taiwan but went on to Japan. Ships would sail on from Taiwan to Japan and return a few months later. Direct VOC trade between Batavia and Japan was rare until 1662 when they lost Taiwan. However, the products in demand in Japan came for the greater part from the Asian mainland. In addition, trade with Japan was regulated very strictly by the Japanese authorities who not only controlled which goods could be imported and exported, but also in which period the sales could take place. On account of the variation between the Japanese and Europeans calendar years, this would be some time in October. The VOC skippers could not make their own decisions to take advantage of favourable conditions

but were completely dependent for their departure on the permission of the Japanese authorities. The ships then only had a very short period to reach Batavia in time to load their goods onto the ships of the return fleet. Ships for Japanese trade did not need to be heavily armed, but they had a good chance of encountering hurricanes while sailing in the East China Sea or in the strait between the Pescadores and Taiwan. In addition to concerns about their highly valuable cargoes, this also meant that ships travelling on this route had to be sturdy and robust. Nevertheless, quite a number of VOC ships were lost due to the weather conditions in this region.

Because the VOC did not succeed in establishing factories in China, the Company tried to buy Chinese products in Cambodia and Vietnam. In the 17th century this area consisted of kingdoms that were more or less vassals to the Chinese emperor and in a permanent state of war with each other. The VOC still tried to get a foothold in a number of places despite these dangerous conditions. Ships could not be too large, because in most cases they had to sail far up river, but on the other hand they had to be heavily armed. Some rivers were so narrow that flutes were preferred over yachts because the woodcarving on the transoms of the latter could be severely damaged by collisions with trees on the shore (NA 1.04.02, VOC 1252, fol. 127). The VOC lost at least three ships in the period covered by this study due to hostilities in the region. Mostly ships would sail directly from Batavia to the Asian mainland around May to be in Taiwan in time to transport a part of their cargo to Japan. Tonckin (the northern part of modern Vietnam) proved to be the most profitable and stable connection. For some time the VOC operated with a number of ships in the silk trade on the Tonckin-Japan-Taiwan-Tonckin route.

The VOC called the waters around Taiwan a *harde en swaer vaerwater* (hard and heavy waters), which meant that ships had to be strongly built and be in good shape in order to sail this route with its difficult sea conditions. The route between Batavia and Siam was considered to be easy and for this old ships could be used.

Inter-regional transport: The compilation of the 'return cargo' in the 1620s

The main cargo for Europe consisted of pepper and spices, but numerous other products were also requested. In a general memorandum written in the 1620s, the VOC directors in the Netherlands instructed the Governor-General, his council and all the merchants in the trading posts all over Asia to send specific products for which they also specified the quantity as well as the quality. Heading the list was large quantities of pepper. Based on the experience up to that time, they expected that this pepper could come from the production areas on Sumatra: Jambi, Campar, Andrigiry, Tyco, Priaman, Celiber, Achim, Ligor, and Bordelon. The directors considered the Malabar Coast to be a potentially rich supplier, if the problem of the Portuguese in that region could be solved. The responsible authorities needed to ensure that only the largest and cleanest peppercorns were sent to the Netherlands. The VOC also requested that cloves, mace and nutmeg be sent annually in enough quantity for a two-year supply in case ´through an accident or other inconvenient circumstances, that God prevent´ there was a shortage and trade in Europe would come to a halt (NA 1.10.30, Geleynssen de Jongh 138, fol. 37).

The *retourschepen* followed a strict time schedule. As stated before, the VOC's preference was to leave Batavia before the end of December; the ship could then arrive in the Netherlands in the late summer or early autumn. During two to four months time, the cargo was unloaded, the ship cleaned, repaired and equipped. Depending upon the weather conditions in Europe, the ship could then leave the North Sea in January to sail to Batavia in seven to eight months. The Cape of Good Hope was not yet a permanent staging post and compulsory stopover for the ships on their way to the East Indies before 1650. Still, the Cape was often used as a meeting place and somewhere to leave messages. Supplies and water were taken on board at various places. On the way back to Europe, St Helena was the most frequented place for meeting and supplies.

The *Hollandia* (ID:237) is a good example of one of the first *retourschepen* that sailed almost exclusively between Europe and Asia. The ship left the Netherlands for the first time on Boxing Day, 26th December 1619. Built in 1618 for the Chamber Amsterdam, the *Hollandia* made the

trip between Europe and Asia seven times before it was wrecked on a reef near Lombok on 27 December 1642 (p. 52-53). At 300-400 *last,* it belonged to the largest ship type in the service of the VOC in that period. In 1621 the *Hollandia* was sent to Banda to transport soldiers and in 1624 and 1632 it collected pepper at Jambi. But in all the other cases the ship arrived in Batavia and returned directly to Europe, mostly with a very short turn-around time.

The *Hollandia* is an interesting example of the problems the VOC encountered synchronising the Asian trade system to these voyages to and from the Netherlands. Because the loading of pepper at Jambi took longer then expected, the *Hollandia* left Batavia at the end of January 1625 on her second return voyage. This was rather late, bearing in mind the instructions of the VOC directors. Indeed, the ship did get into great trouble in the midst of the Indian Ocean and had to sail to Madagascar for repairs. Both her companions, *Gouda* (ID:255) and *Middelburg* (ID:378) perished. The voyage is vividly described in the travels of Willem Ysbrands Bontekoe, a book famous in the Netherlands in the 17th century and still read today. The *Hollandia* lost its masts during the storm in the Indian Ocean. The ship was repaired on the Mauritius and was fitted with new masts, locally cut (Hogerwerff 1952; Roeper 1996). These problems gave the directors in the Netherlands new reasons to set the urgent departure of the homeward bound ships from Batavia in December so as to avoid the hurricane season in the Indian Ocean.

Because of the repairs needed, the *Hollandia* could not leave the Netherlands again before May. The third voyage of the ship in 1626 is also very well documented in a journal printed in the 17th century (Commelin 1646f). Shortly after the *Hollandia* left, the skipper discovered that he had to bear the consequences of poor maintenance work during the short turn-around time in the Netherlands. Whether the Mauritian masts were replaced in the Netherlands is unclear, but the repairs were not satisfactory and the ship was leaking heavily when it reached the Atlantic Ocean. During a stop over at Sierra Leone on the west coast of Africa in order to attend to this problem, the carpenter found the bow of the ship in very poor condition. Stops like these could cause long delays, especially on the west coast of Africa, were the wind and current conditions in the Gulf of Guinea could hold the ships up for many weeks. Later when more experience was gained, ships were forbidden to stop in this region and had to follow a very specific course over the Atlantic Ocean, sail close to the east coast of South America and then follow a long curve to the Cape of Good Hope. At Sierra Leone, the *Hollandia* also had an encounter with the illustrious Dutch pirate Claes Compaen. During a short exchange of gunfire, four people, including the vicar and his wife, were killed. However, the homeward-bounder must have been too big and powerful for the pirates. The confrontation ended peacefully with some courtesy calls and even the exchange of presents. After this setback, the continuation of the trip to Batavia was still problematic, and in October the ship lost parts of the bow section. Nevertheless, the *Hollandia* arrived on 14 December 1626 in Batavia, after a relatively fast trip, with 319 souls on board including 27 woman and children. During the trip 25 people died and Commander Schram died shortly after his arrival (Heeres 1896, 02-01-1627).

In view of the repeated strict proscriptions about departure times, the *Hollandia* was too late for the returning fleet of that year, and had to wait until the end of 1627 to return. Given the problems encountered on the journey from Europe, the ship must first have been sent to *Onrust,* an island off the coast of Batavia with repair facilities. In the course of 1627, the return cargo was collected from all parts of Asia. In October, the return fleet was ready for departure to Europe. The management in Batavia under Governor-General Coen, then starting his second term of office, was faced with the following dilemma. The preference was to send the fleet off at the earliest opportunity, taking the ships back to the Netherlands in the late spring or at the start of the European summer, in accordance with the VOC directors' insistence on arriving before the autumn. The sailing scheme dictated by the monsoon however forced the management in Batavia to wait as long as possible in order to include cargo from a number of other destinations. If this cargo missed the return fleet, it would have to be stored in Batavia for a year with all the additional costs and risks. Often, the practice was for one or two ships to wait for the delayed deliveries from the Asian VOC fleet and sail after the main fleet in the first months of the New Year. The VOC directors restricted this practice after the loss of the ships *Gouda* (ID:255) and *Middelburg* (ID:262) in the previous year.

Loading a ship with a cargo of various products was not an easy task. The differences between light and heavy goods in relation to the requirements of the balance of the ship had to be taken into account. The necessity to store products in such a way as to ensure that their quality was preserved, and that they did not contaminate each other during the trip to Europe, such as highly aromatic goods polluting other cargo was equally important.

On 30 October 1627, the return fleet was ready to sail. At the last minute, the management considered loading the ship *Vianen* (ID:422) and sending it off with the fleet. Although they believed that with the pepper that had just arrived in the yacht *Witte Beer* (ID:152) from the west coast of Sumatra, the pepper still in stock, and the cargo they expected 'at any hour' from Bantam, the ship could be loaded, they took the decision not to further delay the departure of the fleet (Colenbrander 1923, p. 624). It still took some days before the fleet was sent off with a letter for the directors in the Netherlands indicating that the management in Batavia could no longer wait for the delayed arrivals in order to prevent the risk of fire or other disasters and to avoid unnecessary loss of salaries, and supplies on board:

> 'deselve alsnu op't spoedichste in compagnie sullen toegesonden werden, sonder die langer in noodeloos perijckel van brandt, schips-leedt, verloop van maentgelden, consumptie van viveres etc. op te senden, […]'
> [These should be sent at the earliest occasion in 'company' without leaving them in unnecessary risk of fire, ship disaster, wastage of salary, consumption of supplies etc.] (Colenbrander 1923, p.17).

The fleet consisting of the *Frederick Hendrick* (ID:405), *Hollandia* (ID:237), *'t Wapen van Delft* (ID:273), *'sLandts Hollandia* (ID:334)[15] and *Galias* (ID:406), left Batavia on 12 November 1627 and arrived in the Netherlands in June 1628. Contrary to regulations, Governor-General Coen did in fact dispatch the *Vianen* in January 1628 with a cargo of Chinese silk received from Taiwan in December.

Batavia was not always the only departure point and ships sometimes sailed to Europe from other destinations in Asia. For example, in December 1626 the ship *Dordrecht* (ID:219) sailed to the Netherlands from Surat. The function of Batavia as the VOC's central rendezvous is reflected in the cargo of the *Hollandia*. Among the correspondence from Asia at that time a so-called *factura* has survived. This document shows the cargo's specification, cost price and supplier and gives a unique insight into the functioning of the Asian trade and shipping network. The *Hollandia*'s cargo of 1627 is chosen as a good example because the origin of the diverse components of the return cargo was fully described and it is representative of the cargo usually sent to Europe in that period. The typical composition of cargo by volume was: 70% pepper, spices and silk each represent 10%, and the last 10% comprised of a variety of miscellaneous products.

The cargo of the November 1627 voyage of the *Hollandia* was sourced from a number of locations and arrived in Batavia from January to October of 1627 (Table 4-1).The complexity of the developing shipping and trade network is evident in the *Hollandia's* collection of cargo.

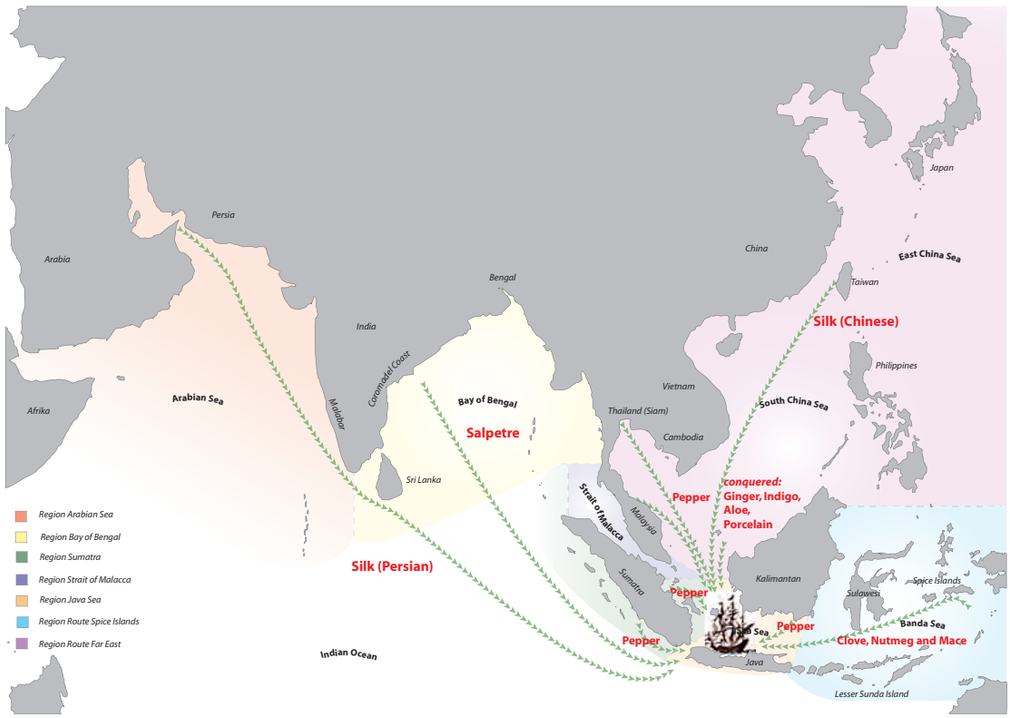
Pepper arrived during the first half of 1627 from: Succadena on Borneo (Kalimantan); Patani (Malay Peninsula); the west coast of Sumatra; south east Sumatra (Jambi) and Siam. The Pepper from Siam arrived in Batavia in the *Cameel* (ID:367) on 7 February 1627. This large merchant ship of 270 *last* then left Batavia on the 19th of February for Ambon and Banda. For larger ships, the end of February was about the latest time of year to sail eastward from Batavia to the Spice Islands. The *Cameel* left Banda on 26 April with a cargo of nutmeg and mace then took on board cloves in Amboina from where it departed in May to arrive back in Batavia on 23 June 1627. Most of the spices brought by this ship were loaded onto the *Hollandia*. Some more mace arrived just in time to be shipped by the *Hollandia*, on the *Munnickendam* (ID:294). This flute left Banda in August (just after the main harvest season), and arrived rather late in Batavia.

Pepper that had arrived in Batavia in November and December from Sumatra was also shipped on the *Vianen* in January 1628. As the cargo of baled silk and pepper had a low specific weight, the *Vianen* needed a substantial load of Japanese copper to ballast the ship. The vessel even returned to Batavia from the Sunda Strait to Batavia for an additional 40 *last* of copper but

the loading of the additional cargo proved problematic for the slender vessel; there were complications getting this ballast down into the hold of the ship without the time consuming task of unloading and re-loading the cargo completely.

Cargo	*Amount*	*Arrived in Bat. with*	*Arrived from*	*Arrival date*
Pepper	54000	*Haen*	Borneo	7-1-1627
Pepper	320000	*Witte Beer*	Patani	29-3-1627
Pepper	300000	*Amsterveen*	west-coast Sumatra	19-1-1627
Pepper		*Amsterveen*	west-coast Sumatra	22-7-1627
Pepper	157500	*Vrede*	Jambi	30-1-1627
Pepper	4350	*Cameel*	Siam	7-2-1627
Pepper	51000	*Local shipping?*	Batavia	
Cloves	38500	*Cameel*	Ambon	23-6-1627
nutmeg	88000	*Cameel*	Banda	23-6-1627
nutmeg	4 barrel	*Cameel*	Banda	23-6-1627
Mace	25700	*Cameel*	Banda	23-6-1627
Mace	1630	*Munnickendam*	Banda	15-10-1627
salpetre	20500	*Medenblick*	Coromandel	13-10-1627
silk (Persian)	28000	*fleet of defence*	Gamron	6-6-1627
silk (Chinese)	40 pack	*Arnemuyden*	Taiwan	13-1-1627
Ginger	29000		conquered	
Indigo	1000		conquered	
Aloe	1 barrel		conquered	
porcelain	16 tubs		conquered	

Table 4.1: The origin of Hollandia's *return cargo is analysed*



Map 4.5: The origin of the Hollandia cargo in Asia

Persian silk was shipped to Batavia in a fleet of war ships that had been in conflict with the Portuguese in the northern part of the Arabian Sea. The ships of this fleet arrived in Batavia in June 1627. Part of their silk cargo was carried by the *Hollandia*.

The saltpetre shipped as 'useful ballast' in the *Hollandia* most probably arrived in Batavia in September with the *Medenblick* (ID:242) from the Coromandel Coast. The timely arrival of this ballast commodity was important; the VOC transport system relied on the availability of enough ballast goods when ships were loaded with lighter cargo.

Some Chinese products like porcelain and ginger were also part of the cargo of the *Hollandia*. These items are reported as 'captured'; it is known that VOC ships defeated at least four Portuguese ships in 1627 in the Strait of Malacca (Colenbrander 1923, p. 33; Heeres 1896, p. 322). Like some of the pepper, the precious stones and musk in the *Hollandia's* cargo most probably arrived from Borneo on the *Haan* (ID:257) in January 1627. Chinese silk had been taken to Batavia from Taiwan on 13 January 1627, too late to be shipped in the return fleet of 1626. More silk was expected from Taiwan, but only arrived in December 1627, again too late to be included in the cargo of the Hollandia. This consignment of Chinese silk was eventually shipped in the *Vianen* which left Batavia two months after the *Hollandia*.

5

The development of the VOC fleet

The main aim of this study is to investigate the role of the VOC fleet and the organisation of shipping in the development of the VOC in Asia during the 17th century. As described in Chapter 2, the inconsistent terminology used to describe the various vessel types can create confusion about the characteristics of specific vessels. To understand the role of these vessels, a number of categories were developed covering features that contributed to the organisation of the VOC in Asia. In this chapter the rationale for these categories is explained.

Eleven categories were identified, comprising of ten rates and a further undefined group. 'Rate 0' contains vessels that were mentioned in the literature but had a minimal role in shipping. For instance, a ship that may only have made one trip, or, alternatively, one about which, apart from its name, no other information is available. The Rates 1 to 10 cover various categories of vessels ranging from the small *afbreekboots* to large *retourschepen*.

Rate	Number
00: undefined vessels	171
01: prefabricated vessels	45
02: Miscellaneous vessels (< 70 *last*)	142
03: small yachts (< 70 *last*)	202
04: small to middle sized flutes (70-170 *last*)	23
05: middle sized yachts (70-170 *last*)	141
06: big flutes (> 170 *last*)	75
07: big yachts (>170 *last*)	62
08: ship (> 170 *last*)	102
09: big men-of-war	31
10: Homeward-bounder	61

Table 5.1: The composition of the VOC fleet in Asia to 1660 in number.

The homeward-bounder or *retourschip* [Rate 10]

The largest and best known ship type in use by the VOC was what the organisation called the *retourschip*. The name originates from the cargoes brought home from Asia, which were called *retouren* in 17th century Dutch. Although Dutch ships returned regularly with Asian cargo after 1597 and the word *retouren* was used from the beginning of the 17th century, the name *retourschip* only emerged after 1620. Prior to this, all vessels returning from Asia were simply referred to as (East-) India ships. From 1625, ships used by the VOC to transport goods from Asia to the Netherlands were called *retourschepen*, but the name also applied to the ship type specially built for this function. The first meaning of the term *retourschip* indicates the use of a certain vessel as a homeward-bounder and 17th century Dutch sources sometimes contain phrases such as 'tot een Retourschip aen te leggen het Jacht Avontsterre' [to be used as a homeward-bounder the yacht *Avondsterre*] (NA 1.04.02, VOC 1196, fol. 350) or 'gebruiken de fluit … tot een retourschip', [use the flute … as a homeward-bounder]. In this study, the use of the names 'homeward-bounder' and '*retourschip*' refers to the second meaning, that is, as the term

for a specialised type of ship. The *retourschip* was a large vessel specially built to bring substantial quantities of Asian products home to the Netherlands. The homeward-bounder was also used within Asia, before a return voyage to the Netherlands or at the end of its career, when it was not considered seaworthy enough to carry the precious cargoes home. The fact that when sailing within Asia these ships were also referred to as *retourschip,* demonstrates that the VOC used this term to define a specific type of ship.

Fig 5.1: Retourschip Salamander, Reinier Nooms. The Salamander (ID 684), a homeward-bounder of around 500 last in the service of the VOC during 1640 and 1661. The ship made six return journeys and is shown here probably during large maintenance in the Netherlands.

Until 1610, nearly all ships sent out by the *Voorcompagniëen* or the VOC were meant to return to the Netherlands. There was no specific category to classify homeward-bounders; larger vessels were termed *schepen* (ships), smaller ones *jachten* (yachts) and the VOC administration maintained a distinction between ships and yachts over the whole period. However, as an added complication the term 'ship' was also used as an inclusive term for vessels in general. The 17th century administrators were already aware of this problem when they wrote: 'dat het nieuwe schip segge jacht genaemt sal werden Bommel' (that the new ship called yacht will be named *Bommel* (ID:384)) or 'dese ses naeghenoemde Schepen *Amsterdam, Dordrecht, Haerlem, Leyden, Delf* ende *Goude* (ID:38), welck laetste Schip een Jacht was' (the following six ships […] of which the last ship is a yacht). At their meeting of October 1616, the assembly of the Heren XVII agreed on a charter with the dimensions for vessel types: large ships with a length of 142 feet and smaller ships or yachts with a length of 130 feet.

When the first Governor-General, Both, was sent to Asia in 1610 to set up a permanent structure for the VOC in Asia, it was the intention of the VOC directors to work with the principle of the homeward-bounders (Rietbergen 1987, p. 222). Although they were not yet called *retourschepen,* the intention was that new large ships would not be used in Asia, but would sail to a main port and load cargo collected in advance by other vessels, allowing a return to the Netherlands as soon as possible. The VOC had good reason to develop such a system because it had experienced the near loss of a number of ships, with their precious freight, after they had first sailed around Asia picking up cargo before they returned to Europe. These round trips throughout Asia could take more then a year and wore the ships out before they commenced their lengthy return voyage. The policy of reserving specialised vessels for the return trip to the Netherlands was clearly the first attempt at a differentiated shipping organisation. However, the number of VOC ships in Asia and the infrastructure in Asia did not allow this policy to be properly implemented. As a result, the new large ships were still used for lengthy trips to

collect cargo from many places in Asia and a fleet of large well-armed ships was built up and used in Asia to counterbalance Portuguese and English forces. In 1615, Both perished at sea on a return trip to the Netherlands when his ship and two others were lost[16], all of which had sailed for over three years in Asian waters (Colenbrander 1919, p.183). The effective deployment of specialised homeward-bounders commenced after the establishment of the VOC headquarters in Batavia in 1619. The significance of these headquarters is discussed in Chapter 7.

From the commencement of this differentiated shipping between Europe and Asia in the 1610's, a new and different ship type was designed, tailored to the inter-continental journey. As these vessels were not commonly available on the market, they needed to be constructed in the VOC's own shipyards. This gave the organisation the opportunity to develop customised homeward-bounders, optimised for their purpose like the grain and timber flutes in Europe. The development of this ship type was often the subject of discussion within the VOC organisation, as is reflected in the resolutions of the Heren XVII. The VOC eventually developed a ship building policy which was the result of of experiences with a variety of models and the insights of both the ship builders and users.

In 1617/18, -the *Dordrecht* (ID:219)- was built in Amsterdam according to the dimensions of the 1616 Charter for the 'large ships'. At the inspection of the ship by the experts of the combined Chambers, the *Dordrecht* was found to have been built slightly broader than the specified dimensions. Although the purpose of the inspection was to make sure that the agreed charter was followed, the committee came to the conclusion that a new charter of ship with the dimension of the beam of the *Dordrecht,* but longer, would better serve the VOC (this changes were laid down in the 1618 Charter). This type of important technical decision was taken by men with extensive experience in shipbuilding. Among them were Jan Rijksen, the VOC master carpenter who, in 1600, had already built two very successful Indiamen with exceptional dimensions for that period, and Pieter Jansz Liorne, the Mayor of Hoorn, who was the initiator of the innovations in Dutch shipbuilding which resulted in the construction of flutes (NA 1.04.02, VOC 100, fol. 450).

The Amsterdam shipbuilder Jan Rijksen played an important role in the development of the homeward-bounders. In 1614, the ships he had built were praised for their excellent performance by those who used them in Asia (NA 1.04.02, VOC 1056, fol. 195). During the first decades of Dutch shipping in Asia, these ships did not just sail between Europe and Asia. Most large vessels built before 1618 only made a few return voyages and were not used or built exclusively for this purpose. Within two years of the 1618 Charter a total of seven vessels were built according to these new ideas, at least one by each Chamber. With regular maintenance, these ships were capable of lasting at least ten years and of making three or four return voyages in that time. Some, like the earlier mentioned *Hollandia* (ID:237), were in fact used for 20 years. This homeward-bounder made seven return voyages, a number that became the standard for the following generations of homeward-bounders. According to the *egalisaties*, the cargo capacity of these ships was 350 *last*. In reality, the *Hollandia* was able to transport 550 *last* (NA 1.04.02, VOC 1076, fol. 131). The vessels of this category of ships were consistently called *retourschepen* from about 1625 on. From this date it can be established with little doubt if newly built vessels were of this type or not. Of the ships built before the 1618 Charter was established, only the *Dordrecht* and two other vessels named and used as homeward-bounders could be classified as Rate 10; the remainder are classified as ships (Rate 8).

Differentiating vessels in this transitional period is not simple. For instance, the classification of the ship *Westvriesland* (ID:193), built in 1616 as an early homeward-bounder, is not clear cut. This vessel, built by the Chamber Hoorn, exceeded the agreed Charter of 1616. The directors of this smaller Chamber created immense problems for themselves in their greed for profit. The ship was probably not much larger than the ships built after the 1618 Charter, but the *Westvriesland's* draught of 20 feet or more when fully laden caused great logistical problems. The only Dutch inlet where this ship could enter safely was the Schelde in Zeeland, where it returned three times not only causing navigational problems, but also problems with the *egalisatie* system since the costs and benefits to the Chamber Zeeland had to be compensated. The Chamber Hoorn's gross disregard of the 1616 Charter initiated a system of mutual inspections and fines.

Although many discussions followed within the VOC about the optimal dimensions for the homeward-bounder, a length of around 160 feet became standard. The maximum draught depended on the limitations dictated by the inlets of the various Dutch ports and was around 20 feet; ships that exceeded that draught could only return to Zeeland or in an emergency to the Eems in Groningen, which did not have a VOC Chamber. The various successive VOC Charters also prescribed variations for in the depth of the hold (NA 1.04.02, VOC 7346, 23-01-1635; NA 1.04.02, VOC 232, 01-11-1640). Vessels with a deeper hold had an extra deck (the so-called *koebrug*) which was structurally necessary to reinforce the vessel. The deeper hold and the extra deck increased the loading capacity of the vessel and also the accommodation area for soldiers. The Chamber of Zeeland occasionally had permission to build ships with a larger draught because it was the only one with a deep-water entrance to their port. These vessels could also have an extra length of 10 feet. (Stapel 1927, p. 463, 465). Other experiments to enlarge the cargo capacity included building broader or longer but shallower ships, were not successful due to a reduction in seaworthiness (NA 1.04.02, VOC 1229, fol. 5)[17]. However, since it was not uncommon for differences to occur between the prescribed charters and the completed ship, it is difficult to judge what the real dimensions of these ships were. An actual cargo carrying capacity of 500 Indian *lasts* (approximately 3000 pounds) of pepper [see *Hollandia* (ID:237)] was a normal figure.

Use of the homeward-bounders in Asia

With the growing volume of the *retouren* (the cargo brought from Asia to the Netherlands), more homeward-bounders were needed. The VOC addressed this issue by initiating a regular building program on its own wharfs in the Netherlands. However, problems with logistics and communication or sudden changes in trade patterns in Asia, often because of hostilities, caused intermittent shortages or oversupplies of homeward-bounders in Batavia (Coolhaas 1960, p. 455). There was also often a mismatch between the dates of arrival at Batavia and the prescribed period for the departure of the return journey of these ships. In these cases, the Governor and his Council in Batavia could choose to use the homeward-bounders for voyages in Asia. Sometimes this was in preparation for the return trip by assigning these ships to take on board a part of the return cargo directly from the production areas. For example, a homeward-bounder could be sent to the south-east coast of Sumatra, where the most important bulk cargo pepper could be loaded (Heeres 1896, p. 122). After the conquest of Malacca in 1640 this port also served as a destination for these ships to load pepper (Van der Chijs 1889, p. 157). Homeward bounders were sent to Taiwan as well, where sugar, used by the VOC as a profitable ballast-good, was available in large quantities (NA 1.04.02, VOC 870, fol. 25).

Homeward-bounders were also used in Asia as heavily armed traders sent to Persia and India. From 1620 on, the VOC tried to organise an annual expedition to the Arabian Sea, the purpose of which was partly military, to conquer or destroy the large Portuguese ships sailing in this area, and partly commercial. Fleets of heavily armed large ships were required, and the *retourschepen* played an important role here. Once in the area, these vessels were also used to transport trade goods. The first of these annual expeditions was organised from the Netherlands, and ships would sail directly to the Cape, then along Madagascar to the Arabian Sea. With additional trade in the area, the logistical problem of matching these expeditions with the shipping from Batavia increased and it was decided to sail to this region only from Batavia, with one or two loaded homeward-bounders sometimes returning directly from Persia or Suratte (in north western India) to the Netherlands.

When a homeward-bounder was no longer considered seaworthy for the return journey or safe enough to carry the rich cargoes, its career was not over. These ships could still be used, often for many years, sailing with cheap bulk cargo on relatively gentle waters. The first destination in this new role could be in the Bay of Bengal, but usually the easy route between Batavia and Siam was used. Ships could be repaired in Siam, or even modified, for example by removing the heavy superstructures used to accommodate many VOC employees on their way from the Netherlands to Asia (Colenbrander 1902, p. 66). Rice and wood were cheap bulk

cargoes from Siam; in some instances the old ships literally floated on their cargo of wood. Old homeward-bounders were often used to transport soldiers and food from Batavia to the Spice Islands. The ships could then be used in that area as floating fortresses (Coolhaas 1964, p. 131) or could return with spices. It must be kept in mind that spices were precious commodities in the European market, but were bulk cargo with a low cost price in Asia. After 20 to 25 years, barring accidents, a homeward-bounder usually ended its career as a *steenhaalder* (stone carrier), a floating warehouse or a 'carpenters-ship' (NA 1.04.02, VOC 677, fol. 52). In this last-named function, the vessel was used to assist with the careening of other ships. When it became too difficult to keep them afloat, the wood was used as firewood, or the hulls sold to local Chinese to be burned down to salvage the structural iron that was still useful (Van der Chijs 1887, p. 195). An interesting observation in this respect is that almost every homeward-bounder which had made a successful voyage back to Europe was selected again to make another voyage to Asia. This is in contrast with the practice in Asia, where homeward–bounders were often decommissioned for the return voyage if their condition was considered deteriorated, most of them staying in service of the VOC in Asia for many years. This could lead to the conclusion that the VOC was less concerned with sending large quantities of money and crew on the outward sailing ships of dubious quality than risking the return of valuable cargo. Initially, it may appear that the reuse potential of a homeward-bounder would be greater in the Netherlands than Asia. However, due to their size they were too large for almost every shipping activity in Europe, and the economic value of these ships on the European market must have been low compared to the exploitation possibilities in the Asian network. These factors might have contributed to the VOC decision to send inferior ships to Asia.

Men-of-war [Rate 9]

Though the homeward-bounder was heavily armed, it was originally designed as a ship to transport a large number of people and large amounts of cargo, not a warship. In Asia, the VOC also used ships originally built for military purposes. Up to 1625, these vessels were not built by the VOC, but provided for by the State as support for the role the VOC played in conflicts. Substantial financial exchanges took place between the VOC and the Dutch State. The VOC had to pay the State large sums of money in taxes and a share of the profit generated by the VOC's many conquests of Portuguese ships. On the other hand, the State agreed to subsidise part of the VOC's activities as their share in the war against the Iberian enemies. Support from the State was provided in the form of ships and equipment seconded from the Admiralties, but could also be a grant or a loan. The Netherlands navy in this period was decentralised like the VOC and there were various Admiralties in the Netherlands all with their own facilities for shipbuilding. They were regularly ordered to hand over ships to the VOC.

This category, men-of-war, includes all ships provided by the Admiralties if there is evidence to suggest that they were built in an Admiralty shipyard for military purposes and not commissioned by the VOC. After 1625, the Admiralties did not provide the VOC with any more ships and the company bought or built a few warships itself. This category also comprises those vessels mentioned in the VOC records as an *oorlogschip* (man-of-war) of which the origin is not known.

Jachten are often mentioned in historical sources as being built or used as *oorlogsjacht* (war-yacht). The rate of a yacht was not sub-classified as the terminology used in the source texts is inconsistent and *jachten* could often operate as both military and trade vessels with equal success. For the explicitly named men-of-war this was not the case. They are distinctly different from cargo ships both in the way they were built and in the way they were used. It is apparent that ships of a certain size were built either as cargo ships or as men-of-war. Distinctive differences include the layout of the decks and the weight of the construction needed for reinforcing the hull and decks. Of course men-of-war could still transport cargo but the difference in the cargo capacity for vessels of comparable size is striking. The *Hollandias* which both operated during the same period and under the same name are good examples. Both *Hollandias* were

listed as ships of 350 *last*. One *Hollandia* (ID:237) was built specifically as a *retourschip* and first sailed to Asia in 1619. Another 'military' *Hollandia* (ID:334) sailed to Asia via South America in the Nassausche fleet in 1623. When both ships sailed back in the return fleet of 1627, the VOC's *retourschip Hollandia* could transport double the cargo of the man-of-war *Hollandia*. The first, appropriately called the 'big' *Hollandia,* carried 1 million pounds of spices (including pepper), 200 *sockels* of mace, 150 bundles of silk and 20.502 pounds of saltpetre as ballast. It is worth noting that the spices alone accounted for nearly 350 *last* in 17th century terms. The other *Hollandia* could only carry 500.000 pounds of pepper and spices, 90 *sockels* of mace, 150 bundles of silk and 27.135 pounds of saltpetre as ballast. Both ships can be considered to have been fully laden (NA 1.04.02, VOC 1191, fol. 567). Drastic modifications were required to make the men-of-war suitable for cargo transport, such as sealing gun ports, which of course made them less suitable for military functions.

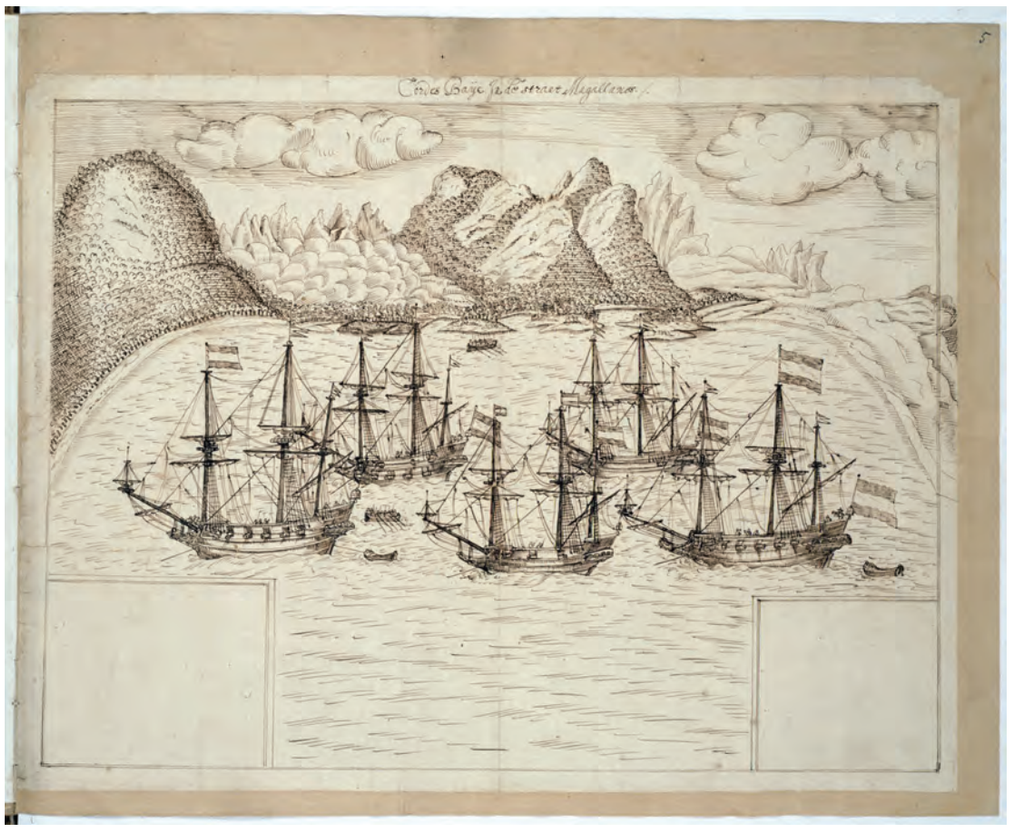


Fig 5.2: View of the bay of Cordes in the Straits of Magelhaen, expedition of Joris van Spilbergen 1615, Badische Landesbibliothek Karlsruhe INV nr 499b.
This is the war fleet of Joris van Spilbergen in the Pacific Ocean in 1615. This fleet depicts an example of the use of the Admiralty ships in the service (partially) of the VOC. The three largest ships are the Grote Maan (ID160) and the Grote Zon (ID167) of the Admiralty of Amsterdam, and the Morgenster (ID162) of the Admiralty of Rotterdam, all classified as Men-of-War, rate 9. The two clearly less heavily armed ships are the De Grote or Zeeuwsche Aelosu of rate-7 (ID151) of the Admiralty of Zeeland , and the de Jager of rate 5(ID 159), which was bought by the VOC. All these vessels remained in the service of the VOC after their arrival at Ternate in 1616 and did not return to the Netherlands.

The dimensions of the large men-of-war are comparable to those of the homeward-bounders. According to the accepted wisdom of the first half of the 17th century, ships of this size were too large to operate in the English Channel (Elias 1916, pp. 54, 59, 90). The Admiralties could only use them on long expeditions against the Iberians in the Atlantic. If such expeditions did

not take place, the ships could be handed over to the VOC. On the other hand: the VOC-built homeward-bounders used in the first Anglo-Dutch War (1652/1653) were the largest ships used by the Dutch. These ships could carry enough heavy weaponry for their military purposes, but they had great difficulty in getting in and out of the Dutch inlets in company with the rest of the fleet (Elias 1933, p. 108; Gardiner 1899-1932a, p. 298; Gardiner 1899-1932b, p. 31). On a few occasions, Admiralty ships came into VOC service in Asia as part of a fleet sent out by the State with specific military goals. After a number of years, they had to return to the Netherlands for maintenance and, unlike the homeward-bounders, were then seldom used again for the VOC. The Admiralty men-of-war remaining in Asia were often not seaworthy after a few years because of damage sustained in the course of their military involvement. Sometimes their service was only temporary and they remained State property and the VOC only managed their operation in Asia. Two State fleets sailing to South America came under VOC management in Asia after crossing the Great Ocean. The most important areas of military action were the waters around the Philippines, the Bay of Bengal and for a short period between 1615 and 1620 in the neighbourhood of the Sunda Strait.

The men-of-war built or bought by the VOC between 1627 and 1637 had a much longer period of service with the VOC. Most of the eight ships called man-of-war in the VOC records made at least two return voyages. Where the homeward-bounders were used for return voyages and sometimes for action in the Arabian Sea, the men-of-war were normally used for military action, but also made one or two return-voyages (including for maintenance purposes). In Asia, their main theatre of operation was the Arabian Sea where the VOC's military objectives gradually changed from patrolling for Portuguese ships at sea to the blockade of Goa. The *Henriette Louise* (ID:605), the last ship built by the VOC specifically as a man-of war, in 1637, had a very long career and made regular return trips in the period when the VOC was not at war with the Portuguese.

After 1640, during the period of peace with European nations, the VOC apparently did not require large warships. When new hostilities broke out with the English and the Portuguese in 1652, the yachts developed to such dimensions that they became the largest vessels with specific military functions sent out by the VOC.

Ships [Rate 8]

A third category of VOC vessels with the type name 'ship' includes those vessels in service in the initial stages of Dutch navigation to Asia, when no differentiation in ship- type was made. These vessels were clearly not specifically homeward-bounders, nor were they men-of-war. Each large vessel was simply termed 'ship' and used for multiple purposes: return-voyages, as men-of-war and cargo carriers within Asia. The difference between ships and yachts during this period is not very clear, mainly because of the lack of reliable primary sources with type names. A vessel of 200 *last* and more was nearly always designated as a ship, but up to 1620 this term also included some smaller vessels.

All vessels for which reliable data are available for a *lastmaat* of 200 *last* or more, but without a reliable type indication, are listed in Rate 8. About 70% of the 100 vessels listed in this rate are the undifferentiated ships of the early period. They sailed to nearly all the VOC destinations in Asia of that period. Other than yachts, there were very few policy guidelines in the early years about sending specific ships to specific destinations. Admiral van Neck, for instance, first ordered the two smallest ships of his fleet to sail to China, because in his judgment the larger ones were not suitable for that area, but later, he himself sailed to that destination on the *Amsterdam* (ID:33), one of the largest ships of this period (Foreest & Booy 1980, pp. 97, 101).

After 1620, most ships used by the VOC had specifications as homeward-bounders or men-of-war, but a few were simply called 'ships' and these are also included in Rate 8. They were larger cargo carriers, ships often already in service for many years in Europe[18] and bought by the VOC for use when the Company needed to send large numbers of people and quantities of supplies to Asia but did not expect to use the ships there afterwards because they thought that crewmen, or the money to buy Asian goods, would not be available there (see next chapter).

Most of these ships did however make some voyages in Asia; some even made a return voyage carrying cargo back to the Netherlands.

Included in this rate are large vessels captured by the VOC from other Europeans. Some large Iberian *caraques* were sailed to the Netherlands with a part of their rich cargo and a number of captured English ships also saw service with the VOC for a short time as men-of-war or cargo ships in the Indies. However those other vessels captured from the English and called 'yachts' in VOC service, (like the *Avondster* (ID:871)) are placed in the appropriate rates. Special cases in Rate 8 are the French ship *Saint Michel* (ID:228), confiscated by the VOC in Asia, and the Spanish Galleon (named *Spaans Galjoen* (ID:670)), which was conquered in Europe by the Dutch, sold to the VOC and then sent to Asia. A few of the *jonk*-named vessels are placed in this rate if there is evidence that they had a large cargo carrying capacity. They were bought and used by the VOC in the beginning of their trade with Siam and Japan, sometimes also calling at Java (Colenbrander & Coolhaas 1923, p. 9; Terpstra 1938, p.89).

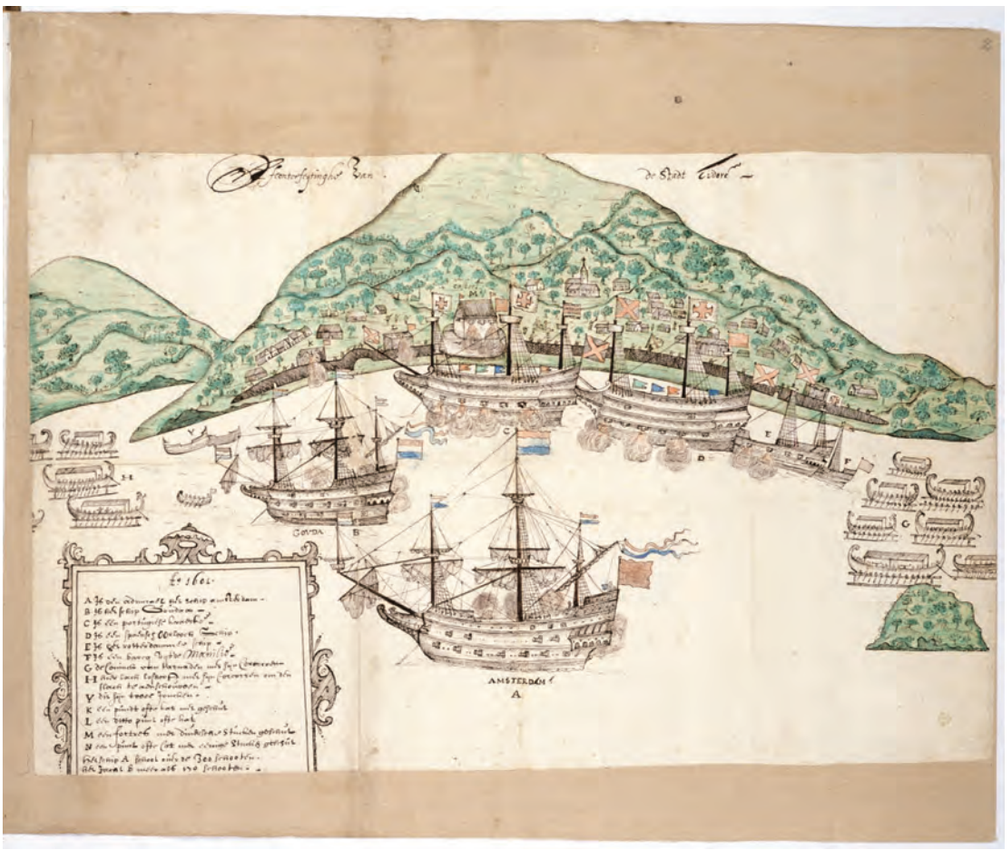


Fig 5.3: View of Tidore, 1601 with the ships Amsterdam and Gouda on the anchorage. Badische Landesbibliothek, Karlsruhe INV nr 499b.
The Amsterdam (ID33), a vessel of rate 8, and the Gouda (ID38) , a vessel of rate 5 during the attack on Tidore in 1601. The Portuguese settlement is defended by two Portuguese ships together with the Dutch yacht Trouw (ID21), which was captured by the Portuguese earlier. The ships are clearly heavily armed as all vessels were, which were out-going during the early period.

Yachts [Rate 1, 3, 5 and 7]

As early as the second Dutch voyage to Asia in 1598-1600, vessels were used which were referred to as 'yachts'. From that time on, yachts were part of nearly all the Dutch fleets sailing to or in Asia. In number and in cargo-carrying capacity they made up the largest part of the

VOC's Asian fleet. Their dimensions varied widely. The smallest were only 20 to 25 *last* whilst the largest appearing in 17th century VOC sources measured 270 to 280 *last*. 17th century drawings of yachts show that their triple masted rigging and semi-enclosed superstructure are identical. All yachts were equipped with cannons, not only with one cannon in the bow, as on some sloops and Asian vessels, but also with a cannon firing sideways through gun ports.

It appears that over time the differences between ships and yachts became more pronounced. In the beginning of the 17th century, vessels with a cargo carrying capacity of 150 to 250 *last* were often referred to as ships, whereas vessels of these dimensions were later more often called yachts. It is not clear whether this was a change in name only or also in design, although there are some indications that ships had a larger beam than yachts of the same length[19]. Because the term ship was also used as a collective noun for vessels of all kinds, those vessels called ships as well as yachts have also been included in the rates for yachts.

Fig 5-4. Naval Battle for Goa 1638. Östereichische Nationalbibiothek.
The men-of-war Utrecht (ID419) is prominent in this illustration, but others, the men-of-war Vlissingen (ID424), the Ter Veer (ID420) and the s'Gravenhage (ID434), all of rate 9, are at the centre of the battle, as are the Homeward-bounders (Wapen van) Rotterdam (ID302) and the Harderwijk (ID561). The smaller (war) yachts Texel (ID418) and Bredam (ID504) are seen to be outside of the battle with Portuguese ships, as well as the three afbreekboots (prefabricated vessels) -on the right- Klein Amsterdam (ID 575), Klein Enkhuizen (ID 582), and the Dolphyn (ID559). Notice that these three afbreekboots (prefabricated vessels) are small, but well armed copies of the larger yachts and do not seem to differ from the yacht de Valck (ID593), of rate 3.

Because of the large range of sizes of yachts and the fact that yachts of different sizes were used for different purposes, it was necessary to divide the category for yachts into the following rates[20]:

- Big yachts of 170 *last* and more – Rate 7
- Medium-sized yachts of 70 to 170 *last* – Rate 5
- Small yachts, under 70 *last* – Rate 3

Generally the difference in function was as follows: The large yachts of rate 7 had such a good defensive and offensive military capability and were so seaworthy, that they did not have to fear any single enemy or the sea conditions in normal heavy weather anywhere. Their action radius was thus not confined by these factors. It is important to note that these yachts were of the same size as the Dutch Admiralty ships in Europe (NA 1.01.08, Liasses State General 5556,

inspection report ships Sardam 1653). The dimensions and the expensive design of these vessels (as compared to other cargo carriers) limited their tasks and areas of operation mostly to military assignments. The amount of cargo they could load was often only of secondary importance. Many shores, ports and rivers were too shallow for these big yachts. Finding and organising repair and maintenance facilities for vessels of these dimensions was a problem for the VOC.

Middle-sized yachts of rate 5 were also heavily armed, but because of their dimensions these vessels were more vulnerable as targets for large European enemy ships. Since these yachts had relatively small numbers of crew, they also ran the risk of being boarded by the enemy although the closed quarters on board could provide some protection and possibly defence. Sailing with other ships, they could make an important contribution to the military force and the agility of such a fleet. On their own they could ship a useful amount of cargo to nearly every port important to the VOC network. These vessels were all-rounders, suited to most Asian destinations, and were primarily used for trade.

The cargo-carrying capacity of the small yachts of Rate 3 was so limited that they were not useful for transporting bulk cargo over longer distances since the crew and their requirements took most of the available space. Their small dimensions also made it a hazard to entrust them with very valuable cargo in nearly all Asian locations (Colenbrander 1920, p. 445). When they did make longer voyages, it was mostly for investigation or communication purposes. They were most useful for logistical and military functions. Yachts with a very shallow draught and which were more or less defensible were required for cargo transport over short distances or controlling local shipping. As an offensive force, these small yachts could only be used against unarmed or poorly armed Asian vessels; their shallowness and good sailing capacities, however, made them more effective for these tasks than the larger yachts. Their seaworthiness was such that they were able to reach any of the areas of importance to the VOC. If they were built in the Netherlands, they were able to sail on their own keel to Asia, but longer operations on open oceans could cause problems.

The yacht in the function of homeward-bounder

In the period before 1620 when there was not yet a regular service of homeward-bounders between Europe and Asia and vice versa, yachts were also used for return voyages and were called *advies-jachten* (literally "yacht of advice" from the 17th century Dutch, which translates to "delivering instructions"). The *advies-jachten* did not belong to a specific type of vessel. Depending on the urgency of the communication, any available yacht could be dispatched from the Netherlands, often with instructions to return immediately from Asia. This kind of yacht is mentioned from 1606 until about 1620 after which communication was regulated in such a way that homeward-bounders and some men-of-war returned to the Netherlands. Only on a few occasions when there was a shortage of homeward-bounders due to unforeseen circumstances, were yachts recalled to the Netherlands. After 1650, yachts were again sent back to the Netherlands on a regular base. By then their dimensions had increased to such an extent that it became useful to employ the largest yachts and flutes for this task. Moreover, these expensive vessels had to be kept in good shape for many years, which was difficult to do adequately in Asia and, therefore, a return trip to the specialist shipbuilding facilities in the Netherlands was advisable.

Large yachts – [Rate 7]

Yachts of this rate of 170 *last* or more, were used by the VOC in Asia from about 1614. Their assignments to Asia often coincided with periods when conflicts with other European nations, England in particular, were expected in Asia. Eight yachts in this rate 7 came into services in 1619 -1621 – during the spice monopoly conflict, 7 in 1626-1630 – a period of tension after the Amboina executions in 1623, and 27 in the years 1652-1655 – during the first Anglo-Dutch war

and the resumption of the war with Portugal; with a total of 42 spread over concentrated periods. The other 18 arrived in Asia at a frequency of less than one big yacht every two years. As the life span of such yachts was usually much longer than the conflict, they were often used for purposes other than those for which they were originally intended. In some instances the conflict even ended before the yachts reached Asia.

From the early 17th century, the larger yachts combined military function with cargo transportation in Asia. After 1614, some large yachts took cargo directly from the Coromandel Coast to the Netherlands. The Portuguese force in this area was such that until about 1630 large well-armed VOC vessels were needed to transport rich cargoes safely. With the development of Batavia as a rendezvous, fewer yachts sailed directly from the Coromandel Coast to the Netherlands. During this period, until 1630, these large yachts also played an important role in the waters around the Philippines in preventing trade between the Spanish and the Chinese. Some were also deployed against the English fleet in the confrontation around Jayakarta (later Batavia). After the conquest of Jayakarta and the establishment of Batavia as the new headquarters, the VOC regularly blockaded Bantam to direct trade to Batavia. To prevent the English vessels from sailing to Bantam, the Dutch fleet needed to include at least one vessel of the same force as the enemy ships, so these blockades were often managed from a Rate 7 yacht, although there were no open hostilities with the English.

In the period between 1630 and 1650, the VOC only purchased a few yachts of 170 *last* or more. The yachts built by the Company in this period were all of Rate 5 dimensions or smaller, with the largest charters in 1632 and 1644 of 120 by 25 feet and 116 by 27 feet respectively. With military conflict with the Portuguese and the English looming from 1650, the VOC felt the need for larger yachts. In 1652, the Company built yachts with a length of 130 feet and a beam of 30 feet at its own wharfs. When the war started in 1653, these dimensions were increased to 134 by 33 feet for new yachts (NA 1.04.02, VOC 7348, 24-05-1653). According to the Heren XVII, yachts of this size had to be brought into the *egalisaties* system at only 130 *last*, but in the *Navale Machten* they are shown as around 250 *last*, which must have been their actual cargo capacity. In the same year, the VOC also bought some large yachts of about the same dimensions from the wharfs in Zaandam, an important Dutch shipbuilding centre of that time. The same yachts were first inspected by the Admiralties, which considered them useful for service after some small adaptations. The high purchase price and the timing – the end of the war – meant that they were not bought by the State (Elias 1933, p. 142). However, a few months after the inspection by the Admiralties, the VOC was able to buy them at a lower price. These yachts are also mentioned in the *Navale Machten* at values of about 250 *last*. Between 1652 and 1655 the VOC sent a total of 27 well-armed large yachts to Asia – three times more than in the previous 20 years. Moreover, the VOC built two large yachts in Siam. During the short war with the English, the VOC also conquered a number of vessels, one of which, the *Avondster* (ID:871), belongs to this rate. However, before most of these big yachts arrived in Asia, the war with England had ended and with it, the urgent need for these vessels of attack in Asia.

In 1655 the VOC found itself with an extensive fleet of well-armed yachts that somehow had to fit in with more peaceful activities. The relatively small cargo capacity of these yachts was not an advantage and the specialised military function was in some cases a problem for trading activities when their appearance made local partners uneasy about the VOC's exact intentions. In the 1650s, the VOC only had need for the offensive military power of these yachts in the Arabian Sea and the Bay of Bengal. Most of the large yachts served in the annual blockade of Goa on a number of occasions. This kept them locked around Goa from September to May during the southwest monsoon. The yachts were then deployed within the area for other purposes. There were limited trade options between Goa and Batavia, the most common was the transport of pepper from the Malabar and cinnamon from Ceylon. Visiting Coromandel on the return trip to Batavia would not allow enough time to refit and then resume activities at the beginning of the next blockade. Commercially, the use of these big yachts for blockades was justified because preventing Portuguese exports from Goa was believed to result in higher profits for the VOC in Europe[21]. During the annual blockade these vessels were fitted with up to 40 cannon and 125 men to enable them to resist possible attempts by the large Portuguese vessels to break through. The Portuguese did not succeed in breaking out of Goa; the Dutch vessels

were indeed able to prevent this on the few occasions when they tried to do so but, although the VOC was able to seriously disrupt the Portuguese transport system, they could not destroy it completely. During the period of good weather in the off season, when the VOC blockade was not in place, Portuguese ships had the opportunity to sail to and from Goa.

Sometimes, if the Portuguese force was considered to be weak enough, VOC vessels would leave the blockade. On these occasions, the large yachts were used in the trade circuit of the Arabian Sea and the Bay of Bengal. Sailing with the monsoon winds, they traded along the coasts of western Asia from the Persian Gulf, around Ceylon to the Ganges Delta and vice versa. These heavily armed yachts were so safe that even local traders trusted their goods to the VOC for transport in this area; large amounts of money or precious metals were safely transported by the VOC. Only two Dutch-built big yachts were lost in this area in the period between 1655 and 1660.

The large VOC yachts sailed another longer -purely commercial- circuit during this period. This route started from Batavia to Japan and from there through the Strait of Malacca to the Arabian Sea and the Bay of Bengal where the yachts were then used in the Western Asian circuit discussed above. On this combined circuit, the yachts could be away from Batavia for over a year often transporting very valuable goods, changing their cargo 4 or 5 times before returning. Their appearance in Japan, however, was counter-productive as Japanese authorities were suspicious of the heavily armed yachts; they were accustomed to trade being conducted with cargo carriers like the flutes (NA 1.04.21, factory Japan 70, 13-08-1657)[22].

Medium-sized Yachts (70-170 last) [Rate 5]

In the early years of the Dutch trade with Asia, yachts of 70–170 *last* regularly sailed to and from Asia with the fleets. These yachts were specifically purchased for this purpose on the Dutch ship market, and were then fitted out for the long intercontinental voyages. The rigging was reinforced and an extra layer of sacrificial planking was added to protect the submerged sections from the destructive effects of the wood-eating shipworm *terredo navalis* that lives in tropical waters and could eat through a hull in a very short time. The medium-sized yachts were a popular vessel-type. About twenty of these yachts were bought by the *Voorcompagnieën* and they served their purpose well as nearly all of them returned to the Netherlands. The role of this vessel-type in the Dutch-Asiatic shipping network was maintained and even extended after the establishment of the VOC in 1602. In 1603 they decided to leave three yachts[23] in Asia to set up the basic infrastructure for trade and to make the acquaintance of the local rulers (NA 1.04.02 VOC 99, fol. 86). In 1607 the four yachts *Arend*, *Griffioen Pauw* and *Valk*[24], were specially built by the VOC for actions in Asia with instructions to remain there. However, the VOC's military ambitions prevented the systematic development of an Asian network with these four ships – although they sailed to various destinations for trading purposes, their main task was to take part in military actions like the blockade of Malacca and the expedition to the Philippines.

In 1613, simultaneous to the development of the homeward-bounder system, the directors in the Netherlands discussed setting up a schedule for annual *adviesjachten*. In order to meet the VOC's need to 'receive tidings and advice from Indien' they proposed to buy three or four light sailing vessels of around 100 *last*. Since these yachts were dedicated to delivering information for the organisation and would not sail further than Java, they could manage with pinewood sheathing and light armaments. On their way to Asia, they were allowed to call at the island of Mauritius to collect ebony for the ships loading at Java where, in Bantam, the ebony was used for ballast in other ships.

Assigning vessels to specific tasks was the first sign of an attempt to move toward a differentiated shipping organisation. Soon after the VOC was founded, the directors also decided that some yachts of slightly less than 100 *last* should be kept in Asia. The charters of the first yachts built by the VOC itself (dating from 1603 and 1606) mention yachts of about 100 by 26 feet with a hold of 10 feet deep. Their construction was specifically adapted to tropical waters and the possibility of carrying heavy armaments (NA 1.04.02, VOC 99, fol. 68). The *lastmaat* of the vessels that were intended to remain in Asia, such as the flute after 1620, were shown in the

VOC's records to be lower than it actually was. It is remarkable that the dimensions of the vessels were mostly larger than the prescribed charter while the corresponding *lastmaat*, as per the *egalisaties*, was less. This deflated lastmaat value can be observed in the records of the majority of the vessels that were meant to remain in Asia after 1606 (NA 1.04.02, VOC 99, fol. 186).

In addition to building these ship-types, the VOC also started to buy medium-sized yachts. The first yachts which were sent out by the organisation were not designated for a specific route or purpose but simply for 'sailing within Asia'. However, the VOC would soon pay attention to the specific requirements for vessels in certain areas and modify the yachts accordingly.

Eventually, medium sized yachts were the primary vessels in the VOC's Asian fleet. After 1620, these yachts would seldom sail back to the Netherlands since the task of the *adviesjacht*, that is. direct communication between the Netherlands and the VOC headquarters on Java, was absorbed by the regular *retourvaart*. The lifespan of most of these yachts was shorter than 10 years although some of the purpose built yachts could be in use in Asia for as long as 15 years.

Some vessels captured in Asia from the Iberians and the English are placed in this rate because of the similarity of their functional aspects to medium-sized VOC yachts. Although the majority of the many captured Portuguese vessels were smaller, some – mostly those captured in the period 1620 to1640 – were between 70 and 170 *last*. These are called Portuguese or Spanish *navets* in VOC sources that describe the taking of the vessels. While in use by the VOC they were simply called yachts most of the time. The VOC captured the *navets* from the Portuguese in the Strait of Malacca and on the coasts of India and used them in most regions except Japan and the Arabian Sea, but only for a few years. The VOC captured English yachts were only in service for a short period, with the exception of the yacht *Supply*, captured in 1653 and renamed *Cabo Jasques* after the location at the entrance of the Persian Gulf where it was captured. In 1661 the *Supply*/*Cabo Jasques* (ID:872) was still used by the VOC in the Strait of Malacca[25].

From 1650 onwards the VOC also built yachts of these dimensions in Asia, for instance, on the Coromandel Coast and in Japara on Java. Most of these yachts were used on the coasts of India and Ceylon but they also sailed to the Spice Islands and the South China Sea.

A multi-purpose vessel for Asian shipping

The medium-sized yacht developed as a very successful vessel type within the VOC's fleet in Asia. If extensive military power was not needed in a certain region or when the organisation of trade did not allow large cargo carriers to operate, this type of yacht could be used efficiently on almost every route for almost every purpose. The prefix *oorlogs* (war) was often attached to the term 'yacht' for the vessels of this rate, but no yacht was exclusively called an *oorlogsjacht* (war-yacht). The designations for these yachts reflected their use, which was mainly a combination of military and commercial applications. A selection of the 137 medium-sized yachts in service by the VOC in Asia up to 1660 will be discussed in detail in this section to demonstrate the diversity of their use.

Soon after the VOC's decision to establish a permanent organisation in Asia, discussions started about the most suitable types of vessels for specific purposes in Asia. One of the first ships to show a degree of specialisation on a specific trading route in Asia is the *Der Goes* (ID:123) which sailed to Asia in 1610.[26] This newly built vessel of 109 feet[27] might be considered to be one of the prototypes for the ships for the VOC's Asian fleet. After arriving at Bantam, the *Der Goes* made a trip to the Spice Islands in 1611, after which it was reserved for the regular trade between Bantam and the Coromandel Coast (NA 1.04.02, VOC 1053, 11-03). By 1618, when the ship was worn out, she had made five trips to the Coast. The trips were scheduled with departure from Java at the end of the year and return to Java at the beginning of the following year. On her fifth trip in 1616 the *Der Goes* stayed in the Bay of Bengal and spent her last years in regional shipping; at this time the ship was probably unsafe for the longer journey to Java and back. The *Der Goes* was then replaced by the much larger *Gouden Leeuw* (ID:314) on this scheduled service (MacLeod 1927a, p. 210). It is interesting to note that the *Der Goes* was one of the smallest[28] vessels termed generically "ship" in VOC sources.

Specialised vessels were sent from the Netherlands based on the VOC's experiences of sailing in specific regions of Asia. In 1611 the assessment of the experts of the Chamber of Amsterdam was that the yacht *Groene Leeuw* (ID:133), with a length of 104 feet, a beam of 26 feet and a draught when loaded of 13 ½ feet, would be useful on the Coromandel Coast (NA 1.04.02, VOC 100, fol. 146). This yacht of about 80 or 90 *last* did indeed sail directly from the Netherlands to that coast, but was also used in a number of other areas during its career in Asia of more than 10 years. The *Groene Leeuw* was apparently suitable for gathering sandalwood from Timor and made three voyages in three successive monsoons for this task. The slightly larger *Sterre* (ID:136) purchased in 1611 particularly for use in the Spice Islands, was apparently a less fortunate choice. In 1616, it was already reported to be in a bad condition and it perished after only one voyage to this destination.

In 1620 the Heren XVII made the decision to build yachts that would, in addition to their commercial tasks, be fit for military action in the shallow waters off the coast of Coromandel. It is clear that there was some debate about the best design for these yachts. The VOC employees at the coast reported that, to sail close to the *vlacke cust* (shallow coast) of Coromandel and to be able to take these vessels into the river inlets of this coast for repairs, the draught (when empty) should not exceed 8 or 9 feet (Colenbrander 1922, p. 368). On the other hand, the Chamber of Amsterdam wanted these yachts to have a superstructure to provide shelter for the crew on the long voyage to Asia and during the skirmishes in which these vessels would engage. The yachts also had to be armed with heavy cannon. The decision makers clearly tried to combine too many features in one design. The shallow draught combined with the heavy superstructures resulted in some unsuitable yachts like *de Haan* (ID:257), which was known to have poor stability and sailing capabilities. As early as its maiden voyage the *de Haan* was reported to be too unstable and in need of additional ballast (NA 1.11.01.01, Aanwinsten (1882) 256, fol. 45). Although there were many complaints about its design (Sloos 1898, pp. 126, 123), this yacht was able to sail to Asia and served the VOC there for some years, including the offensive actions on the Chinese coast in 1623, before it capsized near Java in 1628 (Colenbrander 1922, p. 109). By trial and error the VOC arrived at the most suitable yacht design. Another, only slightly larger yacht built in the same period – the *Weesp* (ID:275) – had a successful military career for many years, predominantly in the Arabian Sea, and was still in service in 1637. It functioned at the end of its career as an armed pepper carrier from the trading areas upstream in southern Borneo [Kalimantan] where the rulers were in regular conflict with the VOC.

The multi-functional nature of these yachts is demonstrated by the yacht *Sluys* (ID:775). Built in 1645 by the Chamber Zeeland with prescribed dimensions of 116 feet long, a beam of 27 feet and a draught of 11 feet, the *Sluys's* cargo carrying capacity was about 120 *last*. She was, in her first years, used mostly in the Arabian Sea where good armaments were certainly required for the transport of cargoes such as gold, myrrh and coffee, worth up to 100.000 guilders. Later, the *Sluys* also sailed to the Spice Islands and Sumatra's west coast for cloves and pepper and to the Coromandel Coast for cloth. After 1645 armaments were hardly necessary for a yacht transporting these bulk cargoes in these regions. The *Sluys* was still in service in 1661. Similar yachts in operation in that period had the same diverse cargoes and destinations.

Multi-functionality meant the ability to change from one task to another as well as the capacity to combine military and commercial objectives. The *Concordia* (ID:802) was regularly designated as an *oorlogsyacht* (war-yacht) and was involved in the capture of the *Blessing* (ID:871) and the *Supply* (ID:872). The *Concordia* was also to transport cheap bulk cargoes such as ebony, used as ballast for the homeward-bound fleet from Mauritius to Batavia and coarse pewter from Malacca to Galle. While bringing a very rich cargo from Suratte to the Persian Gulf in the beginning of 1653, news of the start of the first Dutch-Anglo war arrived overland. The yacht was hastily unloaded and sent out to patrol that region in a purely military action, which eventually led to conflict with, and the subsequent capture of, the English East-India vessel *Blessing*. After escorting the captured English vessels into Gamron, the *Concordia* loaded its share of the 400 bales of silk bought by the VOC in Persia and transported them to Batavia.

The VOC had to make decisions about which vessels would best serve their purposes in varied circumstances in Asia. Military tension was often the catalyst for some swift changes. During the outbreak of the first Dutch-Anglo war the VOC decided to put the emphasis on

more defensible yachts at the cost of the successful cargo carrying but less defensible flutes. Often these choices meant a burden on the VOC later on in times of peace as these military vessels became less economical than those they replaced. The yacht *Domburg* (ID:904) was built during the Dutch-Anglo war but arrived in Asia after that war had ended. Though the need for well-defended cargo transport was no longer urgent in most regions of Asia, the *Domburg* could still serve some purpose through the shipping of a cargo of silver from Japan to Suratte. Its military capacity was fully exploited between May 1659 and May 1660, when the *Domburg* took part in the blockades of Bantam and Goa. Between blockades over the period of a full year it did not have any other commercial task other than transporting 120 *last* of rice from India to Galle.

Small yachts (under 70 last) [Rate 3]

The approximately 200 vessels in this rate are mostly or exclusively referred to as 'yachts' in primary sources, but also included are vessels with other name-types such as *fregat* and *pinas*. Yachts of these dimensions sailed as armed surveyors with the first fleets from the Netherlands to Asia.

Early shipping was organised in fleets and initially these small yachts were to stay in the vicinity of the larger ships, but they quickly made voyages on their own. The first recorded European visit to Australia was made in 1606 by the yacht *Duyfken* (ID:76), measuring only 25 *last*. It was probably 20 metres long and 5 metres[29] wide with accommodation for a crew of around twenty and three gun ports on each side.

In 1608, the Enkhuizen Chamber was allowed to build two ships designated for intra-Asian shipping (NA 1.04.02, VOC 100, fol. 11). The yachts *Brack* (ID:121) and *Hazewind* (ID:118) were built. Both ships sailed to Asia in 1610. The *Brack* only served for a short period, and was wrecked in 1613 on a trip to Japan and the Spice Islands. The *Hazewind*, however, had a longer and more interesting career in intra-Asian shipping. In accordance with shipping practice at that time the yacht made a round trip throughout Asia. It sailed to the Coromandel Coast, to Japan and, from there, directly to the Spice Islands arriving back in Bantam in 1615 where it was deemed to be no longer capable of safe transport over longer distances.

With the development of a network in Asia, these small yachts were used for new purposes in addition to the existing functions of survey, discovery and communication. Shortly after 1610 there was a demand to send small but defensible vessels from the Netherlands to be used in Asia for trade in certain areas. Most probably local vessel-types were not considered defensible enough. Building these small yachts in Asia was not a success, judging by the short period of service of the vessels built there before 1620. There were also serious concerns about their seaworthiness; the *Groene Papegaai*[30] (ID 139) built in Arakan in 1612 and another *Brack* (ID:194) built in Jayakarta in 1617 both capsized on their maiden voyages (Colenbrander 1922, p. 15; NA 1.04.02, VOC 1056, fol. 150).

The small yachts built or bought by the VOC in the Netherlands in the 1610s, were 70 to 80 feet in length with a beam of 15 to 20 feet. Generally they were armed with 6 to 8 cannons and were crewed by 10 to 20 men, depending on the duration of the voyage. From 1612 onwards, small yachts, sent from the Netherlands, transported pepper for the VOC on the shallow Jambi River and blocked the local private trade in cloves (called smuggling by the VOC) in the Spice Islands (Colenbrander 1919, pp. 178, 461; Colenbrander 1922, p. 381). The Jambi River in the southeast of Sumatra was an area where VOC vessels were subject to attacks from small Portuguese *fusts* (vessels probably comparable to a Dutch sloop). The *Halve Maan* (ID:119) was also listed as a *vlieboot* (a small square-sterned vessel in use since the 16th century). It had become famous for its part in Hudson's voyage of discovery to find a passage to Asia in 1609, after which it was sent to Asia where it served the VOC for six more years (Colenbrander 1922, p. 206). The yacht, recorded to be of about 40 *last*, could transport at least 500 *picol* or 60.000 pounds of pepper along the Jambi River.

In the period from 1620 to 1625, when the VOC intended to withdraw from most of the intra-Asian trade, only two small yachts were sent to Asia from the Netherlands. At the same time

about 30 vessels, built in Asia, came into service. Most of these had been captured from the Portuguese, but the VOC now also had the contacts and the capacity to have yachts built in Asia. The VOC had contacts with wharfs in the region near Surat on the Indian coast famous for its shipbuilding tradition (Terpstra 1918, p. 78)[31]. At Ambon, the VOC were able to set up some small-scale shipbuilding once they had developed some understanding of the local materials (Kroniek 1872, p. 471)[32].

From 1625 on, the VOC embarked on a programme to build small yachts in the Netherlands. Their area of service had expanded. To frustrate Portuguese trade or Asians transporting goods for the Portuguese along the coast of China and Coromandel and in the Strait of Malacca, the VOC utilised small but well-armed vessels. In addition, when the establishment of Batavia as a rendezvous brought conflicts between the VOC and the local Javanese rulers, the Dutch used small yachts against local vessels and forces positioned at the harbours of the island. Between 1626 and 1632, three to seven of these small yachts of 50 to 60 *last* were dispatched per year with the fleets from the Netherlands for these tasks in Asia. With these dimensions, they were somewhat larger than the yachts sent out before 1620. They could be armed with up to 12 cannons and could be manned with 40 sailors and soldiers when used for military purposes. Some were soon lost during these confrontations, but others were in service for 10 years in Asia.

Finding the balance between suitability for tasks in Asia and seaworthiness for the voyage to that continent was a process of trial and error. The design of the yacht *Rijswijk* (ID:482) built by the Delft Chamber in 1629 was disastrous. The sailing capacities of this yacht were so bad that it had to be towed by the other ships of the fleet[33] (NA 1.04.02, VOC 1099, fol. 1v). The fleet was hampered to the point that *Rijswijk* was sent back to the Netherlands from the coast of Brazil despite the issue of the defensibility of this vessel sailing on its own. On its way back in 1630, it was captured by Dunkirk pirates operating from the Flemish coast. When in 1632 another small yacht was captured on its way to Asia, the VOC changed their *modus operandi*. From then on, for a number of years, small yachts were transported to Asia in the large ships in prefabricated form and assembled there; these so-called *afbreekboots* are classified as Rate 1 and are discussed on page 82.

After 1640, the VOC made a further change in policy regarding the smaller vessels. The truce with the Portuguese in Asia meant that fewer armed vessels were needed in this region and the reduction of the threat from the privateers in European waters made it possible to send less defensible vessels to Asia. Vessels of very small dimensions sailed with the fleets to Asia on some occasions. These were the smallest sized yachts of between 20-40 *last* that could be used over longer distances. The area these small vessels sailed in the period between 1640 and 1650 is quite remarkable. The *Leeuwerik* (ID:715), a yacht of 40 *last*, was used in Asia for 15 years and sailed to both Japan and to Persia. The even smaller *Zeemeeuw* (ID:738) of 25 *last* brought seven slaves from Madagascar to Mauritius, and also made a voyage of discovery to Australia (Heeringa 1895, p. 1025). The extensive use of these smaller vessels in this period can also be explained by the fact that it was the first time in its existence that the VOC had no need to fear confrontations with other European military forces in the Asian waters of the VOC trade network. The only area where the VOC used its military force against Europeans in this period was in the waters around the Philippines to prevent trade between the Spanish and the Chinese.

Frigates and other small vessels [Rate 3]

Of the 200 vessels in Rate 3 only 70 originated from the Netherlands and most of them were built in Asia. Vessels of less than 70 *last* in Asia were often listed as 'frigates'. The VOC used these type-descriptions very regularly for small captured Portuguese vessels or for small vessels that the Company had themselves built in Asia for their own use. However, the frigate was almost always also listed as a yacht . For this reason it is hardly possible to distinguish between yachts and frigates of less the 70 *last* and both are therefore included in the classification: Rate 3 [34]. The frigate in the VOC fleet clearly originated in Asia; only once was a vessel listed as a

frigate equipped from the Netherlands: *Waeckende Boeij* (ID:750). Governor Van Diemen mentioned that frigates were very useful in fighting small Portuguese vessels. The frigates therefore must have been well-armed and had good sailing capabilities (Coolhaas 1964, p. 108). This is supported by the renaming of frigates sent to Ceylon as "yachts equipped for war" (Anthonisz 1902, p. 265).

From VOC descriptions we have the basic specifications of the Portuguese frigates. They were vessels of 70 feet long with a beam of about 15 feet, crewed for war by 30 men with 5 cannon: three in the front and two in the stern (Colenbrander 1898, p. 125). Around 1620, the VOC built three frigates of 70 feet long and 16 feet wide in the area of Suratte. They were used for a number of years as yachts in the Spice Islands to counteract 'smuggling'. Most captured Portuguese frigates had a short career with the VOC. As an exception, the frigate *Pera* (ID:268), captured in the Strait of Malacca in 1620, together with the frigate *Arnhem* (ID:306) ,built in Asia,[35] undertook a voyage of discovery in the Gulf of Carpentaria during the second VOC expedition to that area in 1623, after which it operated in the Spice Islands until 1627. The majority of frigates captured from the Portuguese in the Strait of Malacca were also used by the VOC in this important route between the Bay of Bengal and the South China Sea. Using the principle 'it takes a thief to catch a thief', captured frigates were deployed to attack other Portuguese vessels. Because of their sailing capabilities they were seen as better adapted to this task than the Dutch built yachts.

Another ship-type included in this rate is the *pinas*. At the end of the 16th century, the *pinas* was a small war-ship much used by the Dutch Admiralties. Some of these *pinasses* sailed out to Asia with the first fleets. In the 17th century, the type-name no longer appears in VOC documents for vessels in Asian waters although in the Netherlands the type-name *pinas* was in use for a heavily armed trade-ship whose dimensions increased over time. Some confusion can arise with the type-indication *pinance*, also used in English sources in the 17th century for small surveyors called 'yachts' in most Dutch sources.

The small yachts could be rowed in emergencies but were not specially designed for this manner of propulsion. Oars are even mentioned for VOC vessels up to 150 *last* (Colenbrander 1922, p. 316). The only mention found in the VOC sources to rowing over long distances, is the use of the small tenders to rescue crews after a shipwreck. Around 1620 there was a short period when the VOC attempted to use galleys in Asia. Initially this type of vessel was mostly used in the Mediterranean Sea. Galleys were propelled by large numbers of forced oarsmen. The Iberians were also successful in employing these vessels in the region of the Moluccas. Galleys were ideal to avoid the VOC blockades in times of little wind and to take supplies and soldiers to their strongholds. These vessels were also successful in taking some smaller Dutch vessels, like the one in 1608 with Admiral van Caerden on board.

Around 1600, the Dutch gained some experience in constructing and using this effective vessel-type in their battle against Spanish galleys operating from Dunkirk on the Flemish coast. Some galleys were brought from the Netherlands to be assembled in Asia (Colenbrander 1920, p. 460; Colenbrander 1919, p. 442; Colenbrander 1922, pp. 578, 629, 949). Another galley was captured from the Portuguese in the Moluccas (Rietbergen 1987, pp. 258, 344) and one was built on the island of Onrust near Batavia (Colenbrander 1919, pp. 287, 389). These vessels, however, were not successful partly due to their poor construction but also because of a lack of manpower to row them. A separate rate for rowing vessels was not included in the classification system, and these vessels fit the criteria for, and are included in Rate 3.

Prefabricated vessels (*Afbreekboots*) [Rate 1]

A special category was developed for the so-called *afbreekboots*. These were small vessels, mostly yachts, prefabricated in the Netherlands and loaded onto larger ships. *Afbreekboots* are also referred to in the reference sources as *sloep*, *sloepjacht* or *roeifregat*, but these vessels were clearly different from the tenders that were standard equipment for larger ships and which could be hoisted onto larger vessels. The *afbreekboots* were assembled at ports on route to Asia or in destinations in Asia like Batavia or the Spice Islands and, after construction, sailed inde-

pendently. They were reported in the logs of early Dutch fleets sent out by the Voorcompagnieën (Keuning 1938, p. LXII). *Afbreekboots* provided the VOC with the ability to use small yachts as surveyors, without the problem of having them undertake the whole voyage on their own keel. In addition, they could be assembled in places where no shipbuilding facilities were available to the Dutch. These vessels were first built and then dismantled in a 'construction kit' form. Initially, the newly built vessel was cut into parts, but reassembling turned out to be difficult. A *Pinasse* was transported in sections on the voyage of Mahu en de Cordes in 1599 but it took the crew days and a good deal of worry to fit the parts together. The result was not satisfactory as the vessel was not watertight (Wieder 1923, pp. 192, 226). In the years that followed there were many arguments about the best design for this type of vessel. Eventually the VOC chose to take the various construction elements apart, rather than cutting the completed vessels into sections, and had them shipped as real 'do-it-yourself' kits.

It is surprising that later on, when better shipbuilding facilities for small vessels were available to the VOC in many places in Asia, the Company still sent prefabricated yachts to Asia. A possible explanation is that the Dutch shipbuilders in Asia were already fully employed with the repair and maintenance of the VOC ships and perhaps it was cheaper to do this instead of acquiring local materials and organising construction in Asia. In the Netherlands, shipbuilding was cheap and easy, with all requisite materials to hand, while there were numerous complaints about the problems of shipbuilding under tropical conditions. The economic benefits from shipbuilding for the VOC directors in the Netherlands might also be relevant. In total, 43 small yachts operating in Asia were identified as *afbreekboots*. Normally they were used for survey and discovery in and around the Indonesian Archipelago. On some occasions, these vessels were also employed on voyages of exploration into uncharted regions. However, during the expedition to the Gulf of Carpentaria in the north of Australia in 1636, the prefabricated *Cleen Amsterdam* (ID:575) and *Cleen Wesel* (ID:538) turned out to be too narrow in the beam for use on such rough seas (Colenbrander 1899, 14-09-1636; Coolhaas 1960, p. 560).

The printed travelogues give the dimensions for some of the prefabricated boats of the earlier period because apparently it was thought that there was little familiarity with these vessels (Wieder 1923, pp. 57, 192). They were of about 10 *last*. After 1630, some had a fully covered hold, with accommodation for the crew above this deck and could carry a cargo of about 20 *last* (Coolhaas 1960, p. 510). Their length was comparable to the smallest yachts sailing independently to Asia: from 70 to slightly over 80 feet. (see also figure 5-4)

The *Nieuwicheyt* (ID:357) is a good example of the confusing contemporary use of type-names and also of the multifarious functions of the prefabricated vessels. The vessel in part form was transported on the ships of the *Nassausche* fleet sent out by the Dutch Admiralties to South America. It was assembled in 1624 on the western coast of that continent, and it sailed with the fleet on its own keel over the Great Ocean to the Spice Islands. In the journals of this voyage the vessel is called *roeychaloupe*[36]. After reaching Batavia, the *Nieuwicheyt* was called a *opgeboeide sloup* (built up sloop). The vessel was apparently defensible enough to be used to patrol in the Strait of Malacca and in 1627, it even sailed with the fleet going to the Arabian Sea, this time simply as a *chaloupe.* After returning to Batavia, the *Nieuwicheyt* patrolled the coast of Java under the type-name *fregat* and in an emergency situation was selected to take a letter to the Coast of Coromandel. In this last activity it was called a *jacht* and even *adviesjacht*. When the *Nieuwicheyt* arrived back in Batavia, it was dispatched to load pepper on the river of Banjermassin on Kalimantan with instructions to be careful there because '*de sloep van boven open en gants niet defencibel*' (the sloop was completely open above and not defensible) (Colenbrander 1923, p. 449). If the name was not so unusual and the evidence from the dates of arrival and departure so convincing, it could be that a number of different vessels named *Nieuwicheyt* existed at the same time.

The policy relating to prefabricated yachts changed abruptly in 1640. After this date, no *afbreekboots* were sent to Asia. The *Heren XVII* had already discussed this change in 1637 and decided to send one small yacht to Asia as an experiment. The *Roemerswaal* (ID:592) with 26 crewmembers and of about 40 *last* arrived safe and sound in Batavia (Coolhaas 1960, p. 603). In 1641, two even smaller vessels were bought by the VOC in the Netherlands and sailed on their own keel to Batavia. They were recorded as *quel* or *galjot* (galliot) with a capacity of only

10 *last*. The new charter decided on by the *Heren XVII* for small yachts was 70 feet long and 20 wide, whereas the last one for the prefabricated yachts was 82 feet by 18 (NA 1.04.02, VOC 102, fol. 10; NA 1.04.02, VOC 7346, 17-09-1636). Sending these small vessels on their own keel was possible due to the reduced threat from privateers. The advantage was that the larger ships could carry more spare materials for the fleet in Asia (Coolhaas 1960, p. 603). The galliots are included and discussed in Rate 2.

Flutes [Rate 4 and 6]

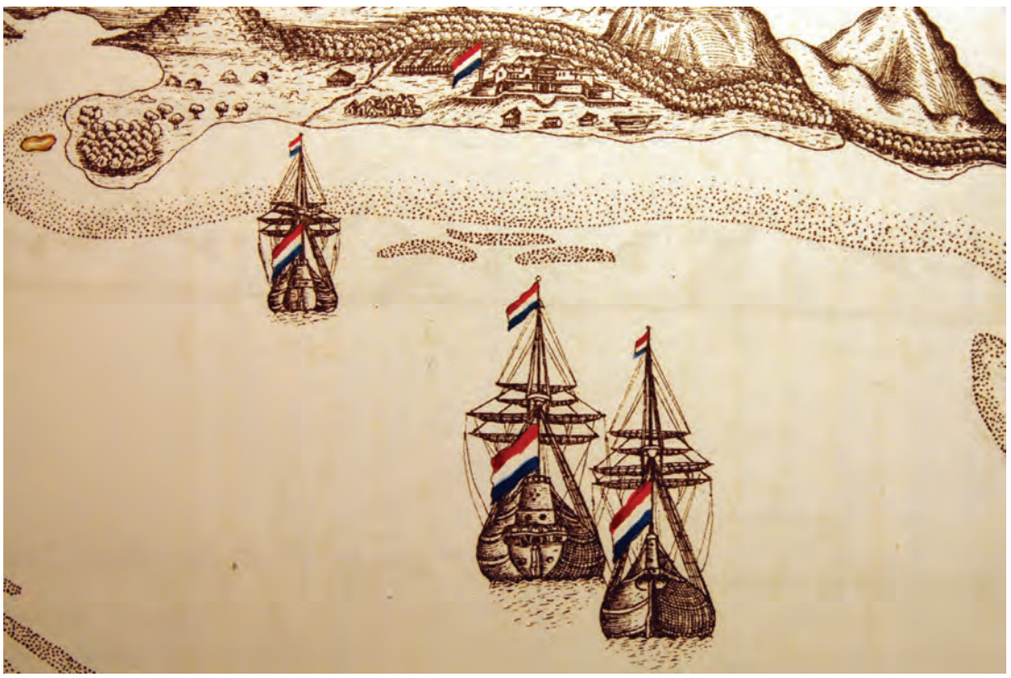


Fig 5.5: Abel Tasman's ships of his discovery journey in 1642, at anchor at Mauritius. Nationaal Archief. On all illustrations which are attached to his journal, there is a clear distinction between the fluyt Zeehaan (ID 693) of rate 6, and the (war) yacht Heemskerck (ID649). The yacht Heemskerck, (with the de flat transom) is flying the flag of the main topmast as a sign that it is the Admirals ship; the fluyt Zeehaan (with the round transom) is depicted as being smaller than the Heemskerck, even though its cargo capacity is twice as large as that of the Heemskerck. Besides this discovery journey, the Heemskerck was also used in the military actions to Goa and Manilla; the Zeehaan was mostly used for cargo transport.
The illustration shows how the yacht is also shooting towards the back, but the fluyt is defenceless against attackers from that side. The third vessel depicted could be the Swarte Arend (ID 707), a yacht which landed at Mauritius on its way from the Netherlands to Batavia. It is however, more probable that it is the Klein Mauritius (ID 699) – a pre-fabricated vessel (rate 1) – which during Tasmans visit was also used at Mauritius.

At the end of the 16th century in the Netherlands, a ship-type was in development whereby shipbuilders tried to combine large cargo-carrying volumes with small dimensions for tax-paying purposes. At the same time, they wanted to construct a vessel that was easy to sail and could be managed by relatively small crews. With a ratio of one to five (unconventional for that period) , or even six between beam and length, and very full lines with bulging bow and stern sections, they succeeded in this task. In a short period around 1600, this ship-type – originally called (*Hoornse*) *gaing* [37] but later *fluit* – became the most successful cargo ship of north-western Europe. Within the flute concept it was possible to develop different kinds of flutes

with features specially suited to certain cargoes (like wood or grain) or specific regions (e.g. the Northern Atlantic for whaling or the Baltic Sea for trade). However, it took longer for the VOC to use this ship-type in Asia.

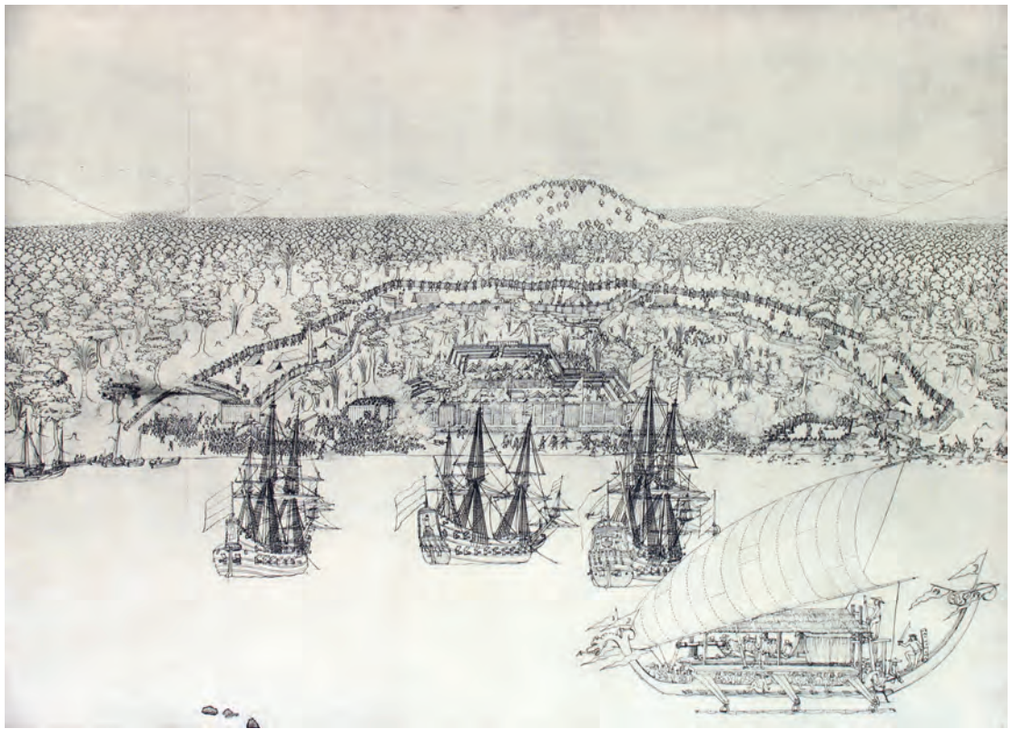


Fig. 5.6: The conquest of Laala by De Vlamingh van Outshoorn, September 20, 1654. Anonymous. Wieder F.C. Monumenta Cartographica The Hague Vol. V, pl. 119.
The illustration shows the attack on Laala (Ceram) by the Vlaming, van Oudshoorn on September the 20th, 1654. On the right hand the Sas-van-Gent (ID790) of rate 3 is to be seen, and on the left, the small fluyt Zaandijk (ID790). This flute has at least 2 cannon ports at the back and must have had a deck inside on which the cannon was placed. This was not the case with the flutes Edam (ID:283) and the Zeehaan (ID:693), which left for Asia in an earlier period and of which was established that they were vulnerable because of the lack of the cannon backwards. The third larger VOC-vessel depicted in the middle of the illustration is the Cochin (ID874). It is most probably a captured Portuguese vessel, which is mentioned as being a yacht with various data about the amount of lasts. Surprisingly, the Cochin still has a holy figure on its transom

The first demand from Asia to send flutes came in December 1614 from Jan Pieterszoon Coen, in his position as Director of Trade. (Colenbrander 1919, p. 106). He called these vessels by the old fashioned name he knew – *gaing* – and asked for them because the Company had a shortage of sailors in Asia. The advantage of the flute, that is, that it could be sailed by a small crew, also meant that these vessels had little accommodation space, which made them less suitable for bringing many people to Asia. Before this request reached the directors in the Netherlands, they had already decided to send flutes to Asia in their Assembly of September 1614. The Chamber Hoorn was ordered to build an experimental vessel of 140 feet long and 24 wide, with a hold depth of 12 feet (NA 1.04.02, VOC 100, fol. 271), which was described as a *'handsame bequaeme fluyte'* (a handy and suitable flute), but also named both a *galiasse* and a *pinasse*. A comparison of dimensions of this and other vessels of the same period bought or built by the VOC shows that this flute was extremely narrow with a somewhat shallow hold (NA 1.04.02, VOC 100, fol. 176). However, the vessel turned out to be suitable for the VOC's purposes in Asia. On a request from the Directors to be advised of the outcome of this trial in order to decide on whether to continue this experiment, the Administration in Asia replied that the flute

was useful and seaworthy (Colenbrander 1922, p. 316). Some modifications were made to make this prototype, named *Galiasse* (ID:173), fit for its task: the accommodation space was considered inadequate, the superstructure in the bow and the stern was extended in Asia, which consequently reduced the sailing capacity. The *Galiasse* proved to be unsuited to military action. After an engagement on the Chinese coast in 1622, when the Galiasse was used to attack Macao, the ship had to be abandoned because of leakage (Groeneveldt 1898, pp. 92, 355). The dimensions were also possibly less suitable for the intercontinental voyage or the routes in Asia because the flutes built later for the VOC were not as narrow[38].

After this first experiment, the Directors regularly raised the possibility of sending flutes to Asia in their meetings, but although Coen kept asking for them, no more were sent out until the 1620s. This delay highlights an interesting ambiguous situation the VOC was in during this transition period: although the general goal was to establish a permanent organisation and a fleet in Asia, in practice the focus was often still on local interests in the Netherlands. Each Chamber preferred to send out homeward-bounders or returning yachts above the cheap flutes that needed only a small investment and little equipment. In 1619 it was again decided that the Chamber of Hoorn would equip a flute – the *Wapen van Hoorn* (ID:250) – but when a vessel sailed out under that name, it was actually a homeward-bounder of 300 *last* (Colenbrander 1911, p. 81). In 1620, two charters were drawn up for the VOC to build two flutes of about 100 feet long (NA 1.04.02, VOC 100, 23-03-1620). There is no evidence that these flutes were built in that year or the next. They were certainly not sent to Asia. In July 1621, it was decided to buy three flutes; two were indeed bought, the *Edam* (ID:283) and the *Gorcum* (ID:287), and sent to Asia with the emphatic advice to use them in Asia and not to let them sail back to Europe again (Colenbrander 1922, p. 518). This tension between the parochial interests of the Chambers and the objectives of the VOC seems to be the reason why no flutes had been sent to Asia. Each Chamber wanted vessels that returned with cargo. Apparently the situation had still not changed by 1633, when Governor-General Brouwer identified this as the reason for the reluctance of the Chambers to equip flutes (Coolhaas 1960, p. 391). That the VOC bought and dispatched some flutes to Asia in the early 1620s seems to be more the result of a sudden need for greater cargo-carrying capacity to Asia, than meeting the requests from Asia for flutes. Cheap flutes, which were freely available on the Dutch ship market, could meet this need. Shortly after 1620, these flutes were partly used in Asia in a way that suited the VOC's politics. In an attempt by the VOC to reduce costs, the Dutch colonists (*vrijburgers)*, who were independent of the Company, were encouraged to take on the role of the cargo traders of Asia. Together with the existing local shippers they brought the required products to the VOC rendezvous point in Java and from there the VOC could confine itself to the transport of goods to the Netherlands. The flute could play a role in this system and indeed one of the first two flutes was sold to the *vrijburgers* in 1625. Two more flutes were sold to them in later years and in 1631, Governor-General Van Diemen suggested sending flutes to Asia to be used by private Dutch traders (Coolhaas 1947). However, the Directors had by then decided to maintain their control over the intra-Asian trade and to keep any profits for the VOC. After that political decision it was a logical step for the Company to send flutes to Asia to use them as efficient cargo carriers on routes within Asia appropriate for this type of vessel.

With the VOC's firm position in Japan, and European traders from the Spice Islands being eliminated, there was a large volume of cargo to be transported by the Company in areas where no military confrontation with heavily armed ships was expected. Nearly all the flutes that came into the service for the VOC in Asia after 1630 made one or two voyages to Japan early in their careers, often via Siam and/or Taiwan and often carrying very rich cargoes.

When flutes became too old to risk such valuable cargoes on the dangerous East and South China Sea, they were then used to transport cargo on the easier waters between Batavia and the Bay of Bengal or the Spice Islands. Flutes in good condition could be used for the pepper trade on the west coast of Sumatra. Old flutes were used to fetch pepper without many problems from southeast Sumatra and Malacca. It was on these routes that the flutes were used until they were no longer seaworthy. Only some of the largest flutes returned to the Netherlands for maintenance

The VOC purchased most flutes sent out, but some were built on VOC wharfs, and there are records that one vessel was built in 1658 on the Coromandel Coast: the flute *Pegu* (ID:1026) (NA 1.04.02, VOC 1227, fol. 66v). In Europe, flutes commonly sailed without cannon or with only lightly armament. VOC flutes were regularly reported as being armed with a considerable number of cannon. However, as they were constructed without a square stern it was difficult to arm flutes with cannon shooting from the stern, which rendered them vulnerable to attack.

After the type-name *gaing* was replaced by *fluit*, this was one of the most consistent type-indications of a VOC vessel of more than 70 *last*. A vessel was a flute, in which case it was always mentioned by that name and never by another type-name, or it was not a flute. Most of the flutes used by the VOC were larger than 150 *last*. Due to the equalisation system which struggled with the administration of vessels that stayed in Asia, all VOC flutes had to be recorded as 100 *last* irrespective of their real capacity (see p. 18) (NA 1.04.02, VOC 7346, 05-12-1637, 16-02-1640). More realistic dimensions can be calculated by taking into account the volume of transported cargoes, values as shown in the *Navale Machten* and the numbers of *lasten* recorded when a flute was bought.

In 1650, when the threat of new hostilities between the Dutch, the English and the Portuguese was imminent, the VOC did not send any more flutes to Asia. Vessels with a greater military capacity were thought to be required. After the war with the English, flutes were again sent to Asia (Coolhaas 1964, p. 813). The demand from Asia at this time was for smaller flutes, to be used in the Channel of Taiwan, the entrance to Fort Zeelandia, which was becoming ever shallower (Stapel 1927, pp. 63, 468). The flutes in Asia now clearly fell into two distinct categories: the large flutes, growing larger and larger, up to 300 *last*, and small flutes. The largest flutes were also used as homeward-bounders (NA 1.04.02, VOC 4455, 17-03-1653), and were in service all over Asia, whereas the small ones were mainly deployed on the Batavia-Japan route and in the area around Taiwan. Flutes of the smallest dimensions, specially suited for use near Taiwan, were hard to buy in the Netherlands, and most of them were built by the VOC. Typical dimensions were 100 feet long, 22 feet wide with a depth in the hold of 9 feet, or respectively 90, 22 and 8½ feet (Stapel 1927, p. 469). When fully laden these flutes could carry approximately 100 *last* and had a draught of one foot more than the depth of the hold, which allowed them to reach Fort Zeelandia on Taiwan with a full cargo.

In the classification of the flutes, the same margins in dimensions are used as for the yachts, i. e. the most realistic cargo capacities and not those from the *egalisaties*. Large flutes in Rate 6 are considered to be of 170 *last* or more, and small flutes (Rate 4) below that value. Vessels smaller than 70 *last* were seldom consistently called flutes. VOC references often refer to them also as *boot(je)* or *galjoot*. Other references confirm this ambiguity of type-names for these smaller vessels (Hoving 1994, p. 314). For this reason a rate for flutes less that 70 *last* has not been created. Vessels occasionally called flutes with a *lastmaat* below this value are included in 'Rate 2 – miscellaneous vessels'

Miscellaneous small vessels [Rate2]

The VOC used a large number of small and very small vessels in Asia, which were sometimes owned by the Company and sometimes used by or for the VOC in other ways. For many of these vessels, nearly always of Asian origin, we only know the type-name. They were mostly used for local transport in ports and on or to roadsteads. They are not included as the scope of this study is limited to ships that were registered, those which can be distinguished by their own name and those which made voyages from one port to another.

In total, 145 vessels of less than 70 *last* meet these requirements and are clearly not yachts. Nearly all vessels over 70 *last* can be classified as one of three main vessel types: ship, yacht or flute. The only other ship-type deserving a separate rate for classification is the *jonk* (junk), of which many were found in the VOC sources. The complication is that this ship type includes a diverse range of vessels: both small vessels, as well as others with a cargo capacity up to 300 *last*. The reality is, however, that in Dutch sources many Asian vessels were simply described as junks but were most probably of very divergent designs. The few junks known to have a large

cargo capacity are included in Rate 8: ships; small junks are included in Rate 2: miscellaneous small vessels.

Fig. 5.7: Bird's eye view of Bangkok, Anonymous, Badische Landesbibliothek.
Vessels flying the Dutch flag at the former toll post Bankock on the River Menam in Thailand. The VOC used locally rented vessels as well as ships built for the company after models of Dutch ships for transport between the Gulf of Siam, where the large ships had to remain, and the capital Ayutthaya, higher up the river. An example of a vessel built after Dutch examples is the 'bark' or yacht Amsterdam (ID 823) of rate 2, which also made voyages to Batavia. It probably looked like the four small vessels on the right, of which one is painted as a 2-masted Dutch 'bezaansjacht', and the other with typical Dutch leeboards.
The two large Dutch ships which lay for anchor at the mouth of the river could be the homeward-bounder Groot Mauritius (ID 145) and the Wapen van Hoorn (ID250) which were at the mouth of the river together during the second half of 1631.

These miscellaneous small vessels were used for a wide variety of utilitarian purposes such as communication, cargo, and transport. Their purpose in military operations was to pursue the smaller Asian vessels. They were not fit to encounter heavy fire because they were only lightly armed and had little protection against cannon shot or boarding by the enemy. This rate gradually took over the role of the Rate 1 vessels (*afbreekboots*) that the VOC brought out from the Netherlands. The Asian vessels in this category were often well adapted for service in a specific region: in the waters around Taiwan small *jonken* that were rented, purchased or captured served as logistical support around this important junction of shipping in the Far East.

A number of vessels with typically Dutch ship-type descriptions were built for the VOC in Asia, apparently to Dutch design. Drawings often show VOC vessels in Asia with typically Dutch leeboards. *Boeiers,* a vessel type originally built for the shallow waters of the Dutch coast, were built and used by the VOC in the Ganges delta where similar conditions existed. But *boeiers* also sailed between the Spice Islands and from there to the Kay and Aru archipelagos east of Banda. *Kaag* and *smack*[39], were also ship-types of the Dutch coastal and inland waters that were used on the relatively sheltered route from Batavia to Jambi where they were able to sail upriver. Vessels named *bark,* were built in Siam to Dutch design and used by the VOC to

transport goods between the capital Ayutthaya and the river mouth, where the large ships had to anchor(NA 1.04.02, VOC 1175, fol. 329-352v). Some of them were so seaworthy that they sailed to Taiwan or Batavia and sometimes even on to the Spice Islands.

Fig. 5.8: View on the harbour of Souratte (Gujarat) ca. 1670, Anonymous, Rijksmuseum Amsterdam. Besides local vessels, ships with a typical Dutch appearance, were used for transporting goods from the anchorage of Suratte (kom van Suali) where the larger ships stayed at anchor, to the unloading sites at the beaches or to the city of Souratte itself, up the river. Many of these ships are not administrated in the database because they were only used for such local transport and not mentioned by their own names in the sources. All the ships which are depicted in detail seem to be modelled on Dutch ship types, but also seem to be adapted to the tropical environment by having an sun tent on the back of the vessel.

Ship type 'Kaag' could be used as being a type depiction under details 1 and 2. In 1624, a vessel named Geldria (ID 1075) is mentioned in the 'Navale Macht' as having been a kaag and being 'lost at sea'. The vessel at detail 3 looks as having been modelled on a Dutch State yacht. Detail 4 could be called a 'boeier'. Two boeiers from 1657 taken up in the database, the Ouglij (ID1000) and the Masulipatnam (ID 995) are evidently from India. The VOC had many small vessels built at local wharfs in the vicinity of Souratte.

After 1640, when the VOC again started to send small vessels on their own keel to Asia, a number of small ship-types not previously mentioned emerge in the historical records. Next to the type-name 'yacht', these small vessels were most often referred to as *galjooten* (galliots) which nomenclature was attributed to 36 different vessels. However, the same vessel-type was also regularly called *boot*, *fregat*, *sloop*, *quel* and sometimes even a (small) flute or yacht. The galliot could apparently have a single smack sail, or it could be square-rigged (NA 1.04.02, VOC 872, fol. 298). It seems that the small single-masted *galjoot* (of only 10 to 20 *last*) was also

called a *quel*, whereas the larger, sometimes triple-masted *galjoot* of 40 to 60 *last* could also be called a *boot* or a flute. The small *quel* could make the long sea voyage from the Netherlands with only twelve or fourteen crewmembers. The galliots were specially used for local transport, particularly in those places where the VOC controlled a large coastal area (like Taiwan, Ceylon and, after 1656, the Cape of Good Hope) and transport between smaller locations within those areas was needed. Galliots were also built in Asia.

The 17th century publisher of a shipbuilding manual Nicolaes Witsen discusses all the Dutch ship-types mentioned in this section. His reflections, translated below, on the design of a ship for the high seas as well as in shallow harbours and rivers exactly illustrates the problems encountered by the VOC (Witsen 1690, p. 182):

> *'Over het bouwen van Boeijers, of Galjoots, die van hier na Rouan in Vrankrijk varen, werdt veel geredekavelt; .. want zy moeten door zee, rivier, en water dat droogh loopt. Ter zee is een lang schip met een diep gaande kiel nut.: op vlieten die ondiep zyn pryst men het platboemt vaar-tuigh: op drooghtens loopt het lange Vaar-tuigh noodt van de lendenen te breeken; in zee het korte van niet te konnen ryzen en van de golven bedekt te worden. Waar om niet zonder reden is de zelvige te voorzien met styve lendenen, en kielen die in 't midden zwaar zyn, doch ondiep: waar tegen de zwaerden dienen vergroot, om in zee het afdryven met een ondiepe kiel te beter te beletten; ook moet men het vlak minder doen ryzen als de gewoonte is, om niet om te slaan, of ongeval te lyden, wanneer de Scheepen op droogh zitten. In 't algemein is raadtzaam, geen Boeijers, of Galjoots, al te zwaar te maken, omdat in dien gevalle de gaffel, of het zeil, als het quaat weer maalt, niet is te beheeren, en de mast het schip zeer doet slingeren, in duiken, en water vangen. Maar het is te raden, in stede van Galjoots of Boeijers van 70 last, Boots met drie masten te bouwen, welke bequamer te redden, en gemakkelijker te beheeren zyn, ook min afdryven'.* [There is a lot of discussion about the building of boeijers or galjoots sailing from here to Rouen in France… because they have to pass through seas, rivers and waters which run dry. At sea a long ship with a deep keel is useful; on rivers which are shallow the flat-bottomed Vessel; on the sands the long Vessel is in danger of breaking, at sea the short will pitch too much and be swamped by the waves. For that reason they must be sturdily built with a keel that is heavy in the middle, though shallow; against this the leeboards have to be larger to prevent the leeway caused by a shallow keel. Also the bottom must not be raised as is usual to prevent capsizing or other problems will occur when the Ships are sitting on the sands. Overall it is advisable not to make Boeiers or Galjoots too heavy, because in that case the gaff, or the sail cannot be managed in bad weather and the mast will make the ship roll and pitch and catch water. It is advisable instead of Galjoots or Boeijers of 70 last, to built Boots with three masts which are easier to manage and make less leeway].

Availability of a suitable fleet: review of the composition of the fleet to 1660

The efficiency and adaptability of the VOC fleet made possible the expansion of Dutch trade in Asia. Trade contacts and shipping routes developed because the VOC had at their disposal an efficient fleet comprised of ships suited to the varied requirements of the organisation. As explained in previous chapters, the VOC's activities in Asia were diverse, the shipping regions were extensive, and extreme nautical conditions could be encountered. The vessels of the fleet needed to be equipped for adverse seas and weather conditions, and able to carry out a range of different activities. These activities could be as varied as: long distance trade; local supply; survey; personnel transport; military action and blockades. In many instances, a vessel had to change from one activity to another very swiftly, when necessary.

As the VOC developed in size and complexity so did their fleet. For each ten year period up to 1660, the number of vessels brought into service and the total size of the fleet were analysed. Vessels that came into service were: constructed in one of the VOC shipyards in the Netherlands; purchased on the lively Dutch market for ships; captured; or in some cases built in Asia. Some vessels were only active for a very short time whilst others served for more than twenty

years. Therefore, a vessel may be counted in successive periods. To determine the size of the fleet at any given time, the entire career of each vessel had to be traced, including all voyages and stays in ports. The analysis of vessel histories provided information about the *lastmaat* or cargo capacity of each vessel at the time it came into service and throughout its career, supplying data on the actual capacity of the VOC fleet per period.

	<1610	1610-20	1620-30	1630-40	1640-50	1650-60	Total
Total vessels in use	128	164	280	282	247	328	
Brought in service	128	131	213	201	160	224	1057

Table 5.2: The development of the VOC fleet up to 1660 in ten-year periods

Table 5.2 shows the overall growth of the VOC fleet. In the first 25 years until 1620, the total fleet increases to 164 vessels. For the following 20 years, between 1620 and 1640, the number of ships used by the VOC in each ten-year period was stable at around 280 active vessels. Between 1640-50 there was a drop in the number of vessels in use. It is only after 1650 that the capacity grew again to 328 vessels in service. These figures do not represent the size of the fleet at a specific moment in time but the total number of vessels that were employed over a ten year period.

In order to understand the policy of the VOC to adjust their fleet to the demands encountered, the figures in Table 5-2 have been refined to show the distribution of vessels by rate, this is shown in Table 5-3.

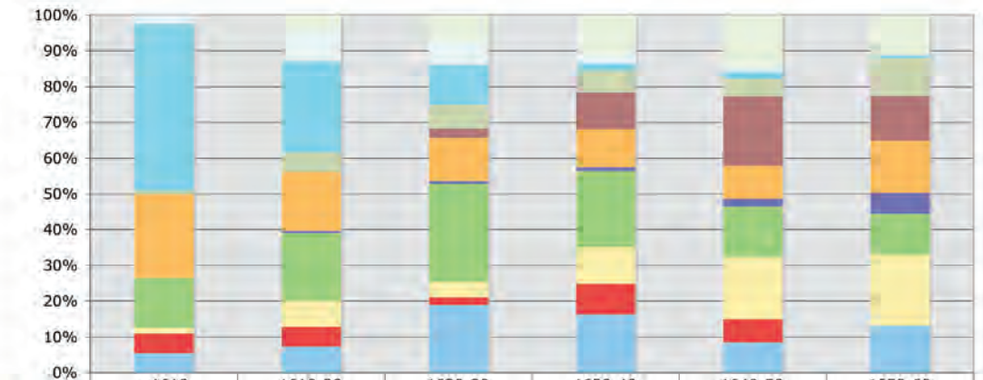
By classifying the vessels into rates, it becomes possible to uncover various factors at work in the development of the VOC fleet in Asia. It is important to note that in the early years, almost half the fleet comprised of rate 8 – unspecified ships and by 1660 rate 8 comprises less than 1% of the fleet. This change demonstrates the introduction of the differentiated fleet.

Although the rate 10 homeward-bounders were primarily intended for the shipping between Europe and Asia, they also played a substantial role in intra-Asian shipping (up to 10% of vessels). It seems a maximum number of 30-40 vessels of this rate was simultaniously in service from 1630 to 1660.

Throughout the entire period the proportion of smaller vessels (rate 0-5) is 50% or higher. The shift in the 1640's from rate 1 to rate 2 vessels within this important sector is an interesting development. This change of vessel types indicates the replacement of European vessels for Asian built vessels.

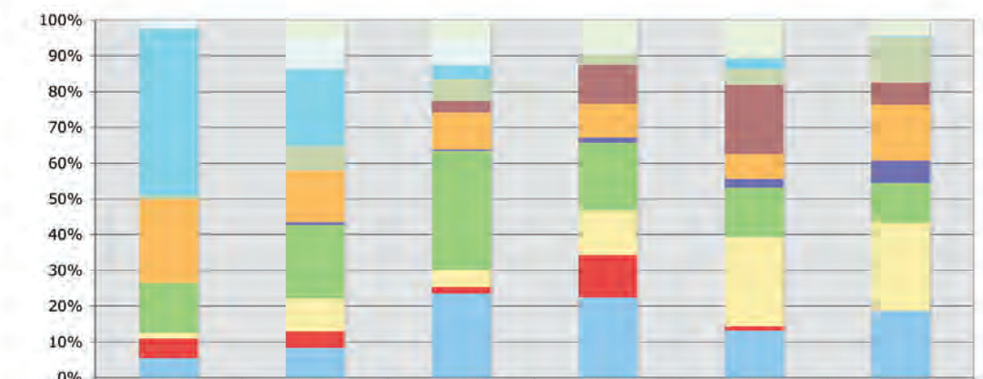
Although Table 5-3 shows the distribution of vessel types within the fleet for certain periods, it doesn't reveal the VOC policies governing the building of the fleet in the changing circumstances. For this information the distribution of vessel types brought into service during these periods needs to be analysed (Table 5-4).

The types of vessels that were brought into service by the VOC during the various stages of its establishment in Asia are shown in Table 5-4. The pattern of vessel types introduced is linked to the VOC's shipping policy. Nevertheless, the data only shows the general developments. A general development that can be seen in Table 5-4 is the increase in the percentage of smaller vessels (up to rate 5) brought into the fleet, reflecting the changing developments of the intra-Asian shipping policy, while the number of larger vessels remains stable – those predominantly used for inter-Asian shipping. Another reason for this high input of smaller vessels is the shorter lifespan of these vessels. By 1630 rates 0-5 comprise more than 70% of the vessels brought into service



	<1610	1610-20	1620-30	1630-40	1640-50	1650-60
Rate 10		7	19	30	35	36
Rate 9	3	14	20	8	4	1
Rate 8	60	42	31	6	5	2
Rate 7	1	9	19	17	12	35
Rate 6			7	29	48	41
Rate 5	30	27	34	30	23	48
Rate 4		1	2	3	5	19
Rate 3	18	31	77	60	35	38
Rate 2	2	12	12	29	43	65
Rate 1	7	9	6	24	16	
Rate 0	7	12	53	46	21	43

Table 5.3: Vessel types in service in Asia up to 1660 in ten-year periods for Rates 0-10



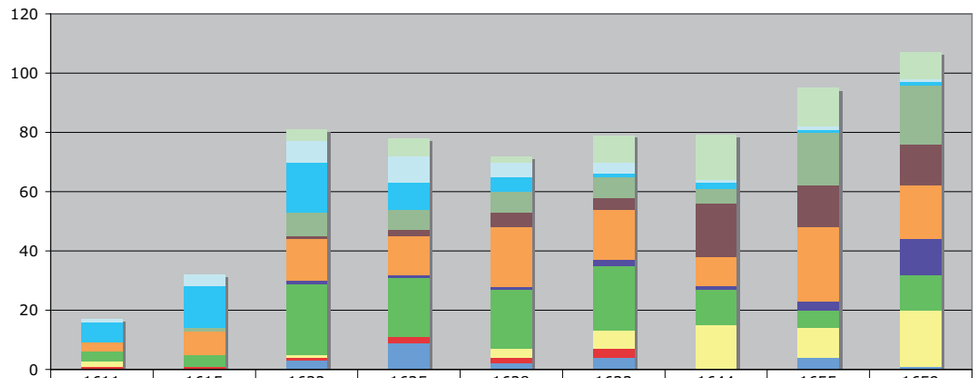
	<1610	1610-20	1620-30	1630-40	1640-50	1650-60
Rate 10		7	12	17	17	10
Rate 9	3	11	15	2		
Rate 8	60	28	8		5	1
Rate 7	1	9	13	6	7	28
Rate 6			7	22	31	14
Rate 5	30	19	22	19	11	35
Rate 4		1	1	3	4	14
Rate 3	18	27	71	38	22	25
Rate 2	2	12	10	25	40	55
Rate 1	7	6	4	24	2	
Rate 0	7	11	50	45	21	42

Table 5.4: Vessel types brought into service up to 1660 in ten-year periods for Rates 0-10

The boom of rate 3 vessels in the 1620s is due to the high input of *fregatten* captured in Asia. The introduction of the flute (rate 4 and 6) from the 1620s is an indication of a period when cargo

carriers could replace more heavily armed vessels, and the decline of the flute in the 1650s reflects the resumption of military tensions in Asia.

As stated, the figures in Table 5-2 do not represent the size of the fleet at a specific moment in time or developments that could take place within a ten-year period. An examination of selected individual years indicates the size of the fleet in use in Asia at certain points. A reconstruction has been made for 1611, 1622, 1633, 1644, and 1655. The selection of these years is based on 1611 as the starting point, because this was the first year a Governor-General in Asia actively pursued a policy of building an Asian fleet. After that, eleven-year intervals were chosen in order to spread the reference years equally over the periods. As the exercise revealed dramatic changes in the composition of the fleet in the analysed years, the additional reference years of 1615, 1625, 1628 and 1659 were examined. This analysis showed that the VOC was able to react swiftly to changing circumstances by bringing specific vessels into service in a relatively short space of time.



	1611	1615	1622	1625	1628	1633	1644	1655	1659
10			4	6	2	9	15	13	9
9	1	4	7	9	5	4	1	1	1
8	7	14	17	9	5	1	2	1	1
7		1	8	7	7	7	5	18	20
6			1	2	5	4	18	14	14
5	3	8	14	13	20	17	10	25	18
4			1	1	1	2	1	3	12
3	3	4	24	20	20	22	12	6	12
2	2		1		3	6	15	10	19
1	1	1	1	2	2	3			
0			3	9	2	4		4	1

Table 5.5: The status of development of the VOC fleet in the selected years

Table 5-5 shows a sharp increase in the size of the VOC fleet in Asia between 1611 and 1622. This is related to the build-up phase of a permanent trade and shipping network in Asia together with the deployment of a fleet of ships to fight the English. Yachts of all sizes (rates 3, 5 and 7) were almost exclusively responsible for the growth of the VOC fleet in this period.

After a peak in 1622, the size of the fleet stabilised at a slightly lower level in 1625 and 1628. This drop was due to the VOC's strategy of cutting costs by attempting to privatise parts of the shipping in Asia; in line with that policy, to concentrate on the shipping between Europe and Asia and leave the Asian trade to the *vrijburgers*. One of the first flutes (*Gorcum* (ID: 287)) that the VOC sent in the 1620s together with some captured Portuguese *fregatten* (e.g. *Rendez-vous* (ID: 342) and *Nieuwe Parel* (ID: 373)) were sold to the private traders. Also, one can observe the growth of private shipping through the so-called *vrijlieden-junks* that were purchased locally. At the same time, the number of ships sent from the Netherlands coming into service in Asia shows a clear low in the 1620's. Between 1617 and 1621, the VOC sent 82 vessels to Asia to build an extensive fleet that could counterbalance the fleet of the English. Between 1622 and 1626, only 51 vessels were sent out. The absolute low was in 1622, when only three vessels were sent (average for 'normal years' was 15 to 16). In 1623 18 ships were sent from the Nether-

lands, but 11 of them were part of the *Nassausche fleet* that was sent by the Dutch government via South America. In 1624, five VOC vessels were sent to Asia. In 1628, this policy of privatisation was abandoned and the number of ships sent from the Netherlands for service in Asia showed a growth again to 79 vessels between 1627 and 1631. Between 1622 and 1633 the composition of the fleet did not change much apart from the introduction of the flute (rates 4 and 6) and the rise of the smaller vessels, many of which were Asian. The flutes show the extended possibilities of sending trade-orientated vessels to Asia; the smaller vessels indicate the VOC's progress in organising their shipping at a local level by using adapted vessels in Asia. In addition, the popularity of the *afbreekboot* (rate 1) reached a peak in 1633.

After 1633 trade was booming. The size and compostion of the fleet in 1644 reflects the primacy of trade in this short and relatively peaceful period. The role of the big flutes grew spectacularly. The role of *retourschepen* was also extended and they were employed more often in Asia. As explained in chapter 7 on the logistical organisation, new *retourschepen* sailed on the Taiwan-Malacca route, middle-aged ships on the Surat-Persia and Thailand-Japan routes and the older *retourschepen* of rate 10 ships sailed between Batavia and Galle, and Thailand and the Spice Islands.

In 1655, the fleet had reverted to a war-orientated composition. More defensible middle-sized and large yachts were employed at the cost of flutes and local vessels in rate 3. The flutes disappeared at a fast pace because they had a lifespan of about ten years in Asia[40] and so, from the peak in 1640, very few still existed in 1655. Only the number of small flutes, needed for logistical support in the Far East, could grow (see chapter 7). After the Anglo-Dutch war was over the yacht was employed on trade routes, but the VOC resumed the sending of flutes to Asia (10 flutes were dispatched between 1656 and 1658). Thereby, the trade-orientated component of the VOC fleet increased. An interesting development is the growth of rate 2. From 1652 onwards, the VOC brought even very small flutes (also called boats) and galliots into service. These smaller utilities were sailed from the Netherlands to Asia or locally built. They became very popular at Taiwan where the channel was silting up and they were also used around Ceylon and the Coromandel Coast.

6

The shipping and logistics in operation

Introduction

The composition of the VOC fleet, including the specific features of vessels tailored for operation in the Asia regions, is an important aspect of how VOC shipping functioned in Asia. Knowledge of the logistical aspects of the VOC's operation is of equal importance for a thorough understanding of this complex organisation.

In this chapter the strengths and weaknesses of the VOC system in Asia are examined. The methods the VOC used to solve bottlenecks and maximise their advantages is the focus in this chapter. The VOC's central focus must have been the efficient use of their fleet. Some of the requirements for this are so basic and obvious that they probably would not be part of a consciously formulated policy. For example, the stipulation that a vessel should stay afloat may seem unnecessary and trivial, but it did determine to a large extent the VOC's operation in Asia. To keep VOC vessels in 'floating condition' an intensive programme of maintenance was required. For this purpose, facilities and materials needed to be available at strategic places within the Asian network. Moreover, the main goal of the VOC – shipping merchandise – was connected to this basic requirement. The nature of the cargo and the way in which it was loaded needed to be organised in such a way that the vessel was stable enough to sail, but not with a draught that was so deep as to cause problems in shallow passages. Vessels that were 'too stable', risked being too inflexible on the swell of the sea and this could easily cause damage to the construction and the rigging. Moreover, a deeper draught could limit the use of a ship drastically – when a ship heels to one side while sailing, the gun ports can fall below the waterline. This occurred on board the ship *Wapen van Hoorn* in 1627. They had limited use of their sails because the supplies of food, water and beer caused problems with stability. Only by rearranging the cargo while sailing could they avoid to jettison these supplies (Colenbrander 1911, p. 83).

Loading the vessel required expertise; the right combination of types of cargo including ballast products, and a system of control so that instructions were followed and cargo was not lost to private trading by the crew. In contrast with the English and the Portuguese, the VOC did not lose ships due to the replacement of ballast with the products of illegal trade[41]. A striking example of this practice was the sudden sinking of a ship of the English East India Company in 1623:

> 'The same evening, in perfectly fair weather, while standing along the coast towards Daman, the former [ship Whale] suddenly heeled over and sank'. According to the Dutch agent at Surat the ballast had been thrown overboard to make room for private trade and the goods of native passengers. Woodcock, the ship's master, on his return to England denied this and furthermore declared that the ship carried 150 tonnes of stones and 40 tons of pepper. However, the Court told him: 'that all the depositions and circumstances considerable in this do concur that she oversett by being overladen in her upper works, carrying 40 peeces of ordnance, whereof four brass cannon of 4.000 weight apeece, besides greate stoare of goodes for private trade, and that the ship was not stiff enough under water' (Foster 1909, p. xxii).

In 1652, the founder of the Cape Colony, Van Riebeeck, complained about the poor way his ship was loaded:

> *'sijnde op 't hoogste beclaeghlijck dat de dienaers ofte sjouwers van d'E Comp in 't vaderlant soo weijnich na de wel gevende ordre van d'E Heeren bewinthebbers passen op 't affladen ende stuwen van de scheepen, waerdoor Comps goet ende sooveel sielen in prijckel worden gestelt, want soo haest comt qualijck een degelijcke wint in de seijlen, off 't schip valt soodanigh op sijde, dat het schijnt te willen omvallen'* [it is highly lamentable that the servants and dock-workers of the honourable Company in the fatherland don't follow the well given instructions of the directors on the loading of the ships, so that the Companies goods and so many souls are placed in jeopardy for as soon as the sails catch some considerable wind, the ships heel over so much that it seems to capsisze.] (Bosman & Thom 1952, 01-1652).

The fine tuning: loading the right combinations of cargo items and ballast products within the right time and at the right place; was often critical and inextricably bound up with the organisation of trade and shipping. To enforce the VOC's trading position, military operations were often necessary; this resulted in another set of specific requirements for the fleet and the VOC staff. Sufficient qualified personnel needed to be available for both trade and military operations.

The above general aspects all had ramifications for the total logistical organisation of the VOC in Asia. They determined the choice and the employment of the various vessel types. In the following section, the logistical development is outlined. This process will be studied by following the changes that took place during the development from the first Dutch voyages. The development of the organisation of shipping is described in a chronological sequence starting with the *Voorcompagnieën* and the early years of the VOC and ending with an analysis of the complex fully operational intra-Asian network. The logistical organisation is discussed in discrete facets such as ship's equipment, crew, maintenance, cargo and ballast.

The early stage of Dutch shipping in Asia

Ships' equipment

At the commencement of the Dutch-Asiatic shipping, the ships that sailed back and forth were, to a large extent, self-contained. This means that, for a trip to Asia and back to Europe, food supplies and spare materials needed to be taken and stored on board. Many spares were carried in order to keep the ship in good shape during the intercontinental voyage followed by a short stay in Asian waters and then the homeward bound voyage (all in a planned period of two years). Vessels needed to have a minimum of two sets of sails including some extra sailcloth (NA 1.04.02, VOC 1142, fol. 205v), eight anchor cables of 100 fathoms (more then 150 metres), eight anchors, an extensive selection of spare ropes, some barrels of pitch, tar and other maintenance materials as well as timber for repairs to the ship. There are not many instances recorded where a lack of spare materials is a problem. In general, the issue was the massive volume that these materials took on board. Luckily the crew of these first voyages were still relatively small compared to the later period, when space on board became a serious issue. In the many ships' journals of the period, the most commonly reported problem was the number of anchors. Operating in still unfamiliar waters, the ships often lost anchors due to a lack of good anchor rope or if they had to cut the ropes and were not able to later salvage them. In 1614, the *Middelburg* arrived in Asia with only one anchor left. It had lost nine anchors on its voyage from Europe. The management in Asia complained about the poor quality of the anchors (Colenbrander 1922, p. 49).

Crew

The crew of the ship was possibly the most important aspect of the self-sufficiency of the expeditions to Asia. At the beginning of Asian shipping, little experience existed in long haul voyages and the size of the crew required had not yet been determined. On the first voyage to Asia, the 249 crewmembers divided over a fleet of four ships (with a total of almost 600 *last*) turned out to be too few to bring all the ships back to Europe. During the voyage, the size of the crew was reduced to such an extent that one of the vessels needed to be abandoned. Of the 249 crewmembers, only 94 survived the trip to Asia. The middle-sized ship *Amsterdam* (ID:1) was destroyed by purpose near Java (Rouffaer & IJzerman 1915, p 177). On the following expeditions from the Netherlands to Asia the same problem arose. During the voyage, the fleet was so under-manned that sailors from Java had to be employed to take the ships back to Europe (De Jonge 1864, p. 482).

On the ship *Lange Bark* (ID:14), so many sailors of the initial crew of 75 were incapacitated that only seven were able to serve at the helm. The hopelessness of the situation was expressed in the ships journal: Two were onboard who could climb the topmast, of which one earned a jar of wine because he had hung the flag, (in my opinion) he would have deserved it more if he had hung a black sheet (cited in Foreest & Booij 1980, p. 218)

Although ships were almost never left behind exclusively due to problems with the crew, the running ashore of the *Liefde* (ID:170)in Japan (Adams 1706, kolom 5) and the *Hendrik Frederik* on Ternate can be partly explained by the lack of capable crew. The burning of the unseaworthy *Haarlem* (ID:39) near Patani in 1604 could also have been as a result of problems with the crew (Foreest & Booij 1981, p. 115).

Almost every ship that was sent out by the *Voorcompagnieën* in this period had substantial difficulties in returning to the Netherlands, because there were simply too few fit crewmembers to sail. On the return voyage of the *Tweede Schipvaart* in 1599, the situation was so pressing that one of the ships even had to borrow crew from an English ship in order to sail safely through the channel back to the Netherlands (Keuning 1951, p. 232). In the expeditions that followed, the experience gained led to larger crews and a drop in mortality due to quicker routes and more reliable staging posts.

However, the larger crews created new logistical problems. In order to house these extra people and their supplies, the space on board needed to be rearranged. In particular, the stock of food for two to three years required new facilities and specially adapted rooms were constructed. The bread rooms, for instance, were sheathed with tin to protect the bread. If the food was consumed in the course of the voyage, these locations were used for the storage of cargo for the return voyage, especially the more valuable and vulnerable products like spices, including pepper (see e.g. Keuning 1942, p. 201; De Jonge 1864, p 471; Van Foreest & Booy 1980, p. 229). Although the larger crews solved the immediate problem, of keeping the ships sailing, new logistical requirements were created of which the Dutch had little experience.

Ballast

Adaptations to the ship to house a larger crew and their supplies created adjustment problems for the ballast of the vessel. Traditionally, the Dutch skippers were able to sail their ships without cargo with only the necessary ballast to make the ships stable. The new problem was the diversity of the equipment and variable nature of food supplies during the voyage. To find the balance between cargo, equipment, supplies and ballast was a challenge for the Dutch skipper. It is obvious that this was a process of trial and error. The early journals describe the difficulties they had in stabilising the ships; sometimes the volume of the required items they had to carry did not provide enough weight to stabilise the ship. Lambert Biesman, who sailed in the fleet of Oliver van Noort, complains in 1598 that they missed a favourable opportunity to sail because: 'the ship was crammed with goods but [was] too unstable to sail' (cited in IJzerman 1926, p. 185).

An additional complication was the heavy armaments that these ships carried in order to be ready for a confrontation with European enemies. In at least one case during this early period, the combination of poor stability and heavy armaments was fatal. The *Maan* (ID:18) capsized because of insufficient ballast near Dover when it fired a salute (De Jonge 1864, p. 216). Often ships made a stopover on the coast of England to take in extra ballast after they left the Netherlands. Based on the experience of the first days at sea, the skipper would send boats to collect ballast stones to adjust the stability of the ship. This constant concern about stability would also be one of the main logistical issues for shipping in Asia, as explained later in this chapter.

Logistics of the shipping route to Asia

Soon after the establishment of the VOC, ships were sent to Asia to serve in the shipping network there. This study is focussed on the intra-Asian shipping and thus also on the logistical aspects once trade and shipping were established there. In most instances, the shipping between Europe and Asia is not included within the scope of this research. However, there are some important aspects of the intercontinental shipping between Europe and Asia that influenced the shipping within Asia. In Asia, the origin of a vessel determined its features to a large extent. Since more then half the vessels in the VOC fleet originated from Europe, they were either large enough and fit enough to make the intercontinental journey on their own keel or small enough to be transported on board another vessel. In the first decades of shipping to Asia, all ships were used for both transport between Europe and Asia and for shipping within Asia. Gradually, these two aspects of Dutch-Asiatic shipping were differentiated and the majority of the fleet in Asia sailed from the Netherlands only once, or stayed in Asia for a longer period and only sailed back to Europe for major maintenance. The VOC also used vessels that were acquired in Asia. Some of these could be built in Asia and therefore did not need to meet the requirements for the intercontinental passage. Others were captured from European competitors who had also made the trip to Asia. Apart from the *afbreekboots* or other vessels that were transported on board other ships, this applied to all vessels sailing on their own keel. Ships from around 20 *last* sailed to Asia independently, and on some occasions without the support of a fleet. The passage over the Atlantic and Indian Ocean required specific features for the rigging, the strength of the construction and the accommodation on board. In the following section these aspects that directly or indirectly influenced intra-Asian shipping, are investigated.

The fitness of the arriving crew in relation with the duration of the voyage

By 1620, the VOC had established the fastest route over the Atlantic Ocean to the Cape of Good Hope and the route to Java over the southern part of the Indian Ocean. If the skipper followed the prescribed course and if no extraordinary setbacks were encountered, a voyage from the Netherlands to Batavia could be made in a minimum time of four to five months. This was, at the same time, the maximum reasonable time span that a ship could stay at sea without taking in fresh water and food. Water and other beverages took up a large volume but they were sufficient for six months if strict rationing was followed. A limiting factor was, however, the lack of fresh food that often resulted in the fast deterioration of the health situation on board due to scurvy after three to four months. A period of five to six months at sea could thus be critical for the safety of the voyage. In June 1624, the yacht *Tortelduif* (ID:344) arrived in Batavia with an immobilised crew. After a little more then seven months at sea scurvy had taken its toll (Heeres 1896, p. 55). Scurvy was a major problem on these long voyages. There were some known remedies like fresh fruit (mainly oranges and limes[42]). Places to provide this fruit were desperately sought after on the first voyages; soon lime juice was also shipped on the outgoing fleets. The ships' officers were explicitly instructed to provide lime juice in the morning and the evening to crewmembers who showed the first signs of scurvy (Commelin 1646b, p. 56). In 1605, the *Gouda* (ID:38) brought in 36 glass bottles of lime juice (NA 1.04.02, VOC 7142, 01-

1605) and the *Sonne* en *Amsterdam* four half amen (310 litres) (NA 1.04.02, VOC 14336, uitrusting 1605). A more intensive method was the growing of vegetables on board (Commelin 1646g, p.5)[43]. Often, however, these measures were not sufficient to keep the crew fit on the long voyages (NA 1,04.02, VOC 1053, Resoluties Bantam).

Some ships made the trip to Java without a stopover, although passing the Cape of Good Hope without taking on refreshments was not without risk. For instance, in January 1627, the *Wapen van Delft* (ID:273) arrived after a voyage of 8 months with 183 deaths. In May 1646, the ship *Nieuw Delft*)ID 711 left the Netherlands and passed the Cape without taking on refreshments. It then proceeded to sail along Madagascar and Mozambique, finally arriving in a desolate condition on the west coast of Sumatra. 165 people had died including the merchant, the skipper and other officers. Eventually the ship had to sail to Batavia under the command of a 'Maleytsche' local steersman and arrived fourteen months after its departure in July 1647 (Coolhaas 1964, p. 311). Ten years later, in 1657, the ship *Hof van Zeelandt* (ID:730) also suffered many losses when a storm forced them to bypass the Cape. In Mauritius twenty people were left behind who were too weak to continue the voyage, another twenty-three died (De Hullu 1904, p. 285). The normal practice was that, on most voyages between Europe and Asia, ships made a stopover. In the period examined, this system centred around one fixed staging post on the Cape of Good Hope, officially established as a colony in 1652.

The choice of seaway and the design of the rigging determined the speed and thus the duration of the voyage. Most vessels sailing from the Netherlands to Asia had three masts. Generally, the rigging of VOC ships was the same as was usual for large vessels on the northwest European shipping routes of the period. Mainly square sails were used on the three masts and the bowsprit. Each of the three masts was divided into a lower mast, extended with strike-able topmasts and topgallants. The system of extendable topmasts made it possible to adjust the length and the surface of the sails to the circumstances. Topmasts could be taken down during periods of strong winds or high waves, thus saving the rigging. The topgallant sails in particular were useful in maintaining a minimum speed in regions of little wind.

This flexible rigging had big advantages for the transatlantic crossings with changing wind and sea conditions and even the smallest VOC vessels were, therefore, capable of making the voyage to Asia. There is no evidence in either the written or the pictorial references that other rigging was in use for vessels sailing to Asia in this period. Even the smaller *galjoten*, sailing to Asia from around 1650 had three masts, contrary to the practice for these vessels in Europe (NA 1.04.02, VOC 872, fol. 298). Apart from the flexibility of operating the rigging under various conditions, the composition of the masts in three parts offered an additional advantage. The size of the masts' parts was limited, which made it possible to carry sufficient spare spars and made replacement during the voyage relatively easy.

A vessel needed to leave for such a long intercontinental voyage substantially over-crewed to be able to buffer possible losses of crewmembers. This lesson was learnt during the period of the *Voorcompagnieën*, when it became clear that a crew size based on a voyage in Europe could cause serious logistical problems. The VOC sailed with twice the number of crew than was required for a European cargo carrier. In addition, the ships were also employed for the transport of the staff and soldiers required for the organisation in Asia. It was not unusual for these ships to have triple the number of men on board on their way to Asia than on their homeward bound voyage. For the return voyage, the VOC also had to calculate a safe number of crewmembers because people that were being repatriated after serving their contract in Asia were often not willing to assist in the work. In addition, homeward-bound ships often had problems with stowaways, which could also cause problems with the provisions

Consequently, the difference in the number of people on board made the cargo capacity on the homeward bound ships much bigger than on the outward sailing ships. Some of the smaller vessels were clearly unable to transport more than their own crew, enough water for a few months and food that would make them self-sufficient for a year. Larger vessels needed to be specially modified to serve as a 'people carrier'. The transport of higher ranked personnel influenced the spatial layout of the ships. Staff above a certain rank had the right to be housed on the higher levels of the ship ('above deck'). In some cases, extra temporary accommodation had to be put in to meet this requirement. In other cases, the basic design of a certain vessel type, the

flute, had to be modified. Flutes normally sailed with small crews, some were specially modified for the VOC with a more extensive superstructure in the stern. The extra deck in the hold of the ship (the so called *koebrug*) constructed to reinforce the larger vessels, gave adequate, although very uncomfortable, accommodation to the large numbers of soldiers sent to Asia (Witsen 1690, p. 178).

Cargo and ballast of the outbound fleets

The expanding organisation in Asia and developing Asian fleet required a growing amount of supplies, equipment and other goods. The new Governor-General Reynst mentioned, in 1614, that the outward bound fleets should bring more equipment to Asia (NA 1.04.02, VOC 1056, 24-01-1614). He anticipated a serious shortage of sails and ropes to maintain the developing Asian fleet. Although he considered the frugality of the management in the Netherlands, why they did not send those goods in generous quantities, it soon became clear that the available cargo space on the Asian-bound fleets was the bottleneck. From around 1615, almost every ship that left the Netherlands was fully loaded. From Asia regular requests were made to send additional older cargo carriers to meet local transport requirements (Colenbrander 1919, p. 106)[44]. The VOC was sometimes forced to send ships with the sole purpose of carrying equipment to Asia. Between 1620 and 1630, a few old cargo carriers were indeed dispatched. The VOC bought these inexpensive old ships for the transport of provisions (and in 1627 the Ambassador of Persia!). These ships were not considered to serve any further purpose then one voyage to Asia after which they could be abandoned or burned (NA 1.04.02, VOC 147, 09-1624; NA 1.04.02, VOC 229, 25-01-1627).

The ships sailing to Asia were consequently so packed with goods that they had problems with handling the rigging. On board of the *Wapen van Hoorn* (ID:250), wine was stowed on the upper deck in such a way that the sailors had to climb on the barrels in order to pull the ropes (Colenbrander 1911, p. 86). The 1620s was also the period when the VOC aimed at privatising the Asian shipping, and it was reluctant to send larger cargo carriers that could remain in Asia. This, of course, also limited the amount of goods that could be sent from the Netherlands. After 1628, when the VOC made the final decision to keep the whole organisation in its own hands, the situation improved and flutes that were leased for the journey to the Atlantic Ocean and back in 1627, were commissioned for intra-Asia shipping (Colenbrander 1923, p. 4). Nevertheless, during the whole period up to 1660 the over laden ships departing the Netherlands remained a matter of concern. For the skipper it sometimes came close to the point where he had to jettison the cargo in order to save his ship, which of course would have been an affront for an employee of the VOC (Colenbrander 1911, p. 83). The demands for European goods by the organisation in Asia were such that, when ships arrived in Batavia only partially laden, there was reason for complaint. For example, in 1634 the Chambers Rotterdam and Hoorn had failed to efficiently load their ships. Batavia had asked the Directors in the Netherlands to make sure that the departing ships were well packed with all the items they required in Asia. They were upset because they had already reduced their demands (the so called *Indische Eysch* (Indian demand)), and had not asked for items that took up a lot of space like roof tiles, bad (cheap) wine, bricks, cement, socks, hats etc and had really hoped to receive yachts[45], masts, planks and other timber. The ship *Frederick Hendrick* (ID:405) that had arrived that year could have brought a *schone partij deelen* (a fair amount of planks) (Coolhaas 1960, p. 458). Contrary to the general belief that VOC ships departed for Batavia fairly empty (Gaastra 2002, 139) most ships were, in fact, fully laden. Illustrative in this case is that Hendrick Decker, in his research on the cargo capacity in 1680, states that *retourschepen* were one or more feet lower -and therefore more heavily laden- when they left the Netherlands than when they returned (NA 1.10.48, Collectie Hudde 22, p. 30)[46].

An extra complication was that part of the cargo capacity of the ship was required to be used for the ballast. Without enough ballast the VOC vessels would not be stable and could not sail. This ballast consisted of various heavy materials. In 1603 the VOC bought 1078 barrels of boulders and in 1604 another 378 barrels from *Voorcompagnie* ships arriving from Asia (NA

1.04.02, VOC 7142, fol. 120, 142), so this ballast was shipped around the full voyage. Wherever possible, the ballast was made up of useful or commercial goods. Some metals from Europe like lead and iron could be sold at a reasonable profit in Asia.[47] Remarkable was the large quantity of tintinago[48], obtained with the capture of *Caraque St. Catharina* (ID:74) in 1603, that was first shipped to the Netherlands and then again shipped back to Asia as ballast because it could be sold for a better price there (NA 1.04.02, VOC 99, 03-1605). Ballast goods were sometimes kept aboard because it was too much trouble to have it removed from underneath the *grenier* – the cargo floor – that was constructed in the hold of the ship (Colenbrander 1922, p. 357)[49]. Worthless ballast stones were taken but so were usable bricks that could be employed for VOC constructions in Asia. As can be witnessed at the remains of the many VOC sites in Asia, millions of bricks must have found their way to Asia as ballast stones. Already in 1603, 200.000 bricks (*gebacken steen*) were bought by the VOC to send with the fleet (NA 1.04.02, VOC 7142, fol. 100).

For larger ships, there was always a trade-off between the limitations of the draught on departure from the Netherlands ports and the need to have sufficient heavy cargo to maintain the ship's stability on route. On occasion, returning ships were loaded too deeply for the waterways of their own chamber and had to sail to the deeper harbour of Zeeland which then created problems with the division of the cargo and the expenses for the equipage (NA 1.04.02, VOC 228, fol. 97).

Logistics of the shipping within Asia

State of maintenance of the fleet

If a ship stayed in Asia for a prolonged period, it usually required a lot of maintenance. Keeping the fleet afloat was a serious logistical problem for the VOC and eventually, each time a vessel was to be serviced, the question to be decided was whether it was still an economical proposition to invest in repairs. In fact, the VOC was wearing out their ships on purpose through a system in which ships were gradually employed on less dangerous routes to transport less valuable goods. The ship *Der Goes* (ID:123) was such a case. In 1617, the ship got stuck on the Coast of Coromandel because, although the planking of the ship had been maintained, the stern and the keel of the vessel were too weak to transport valuable cargoes. It was then decided to use the *Der Goes* for local shipping along the Coromandel Coast (NA 1.04.02, VOC 1065, fol. 74). It is amazing how long the VOC kept its vessels operational even after the technical state of a ship was considered hopeless. For instance, the yacht *Ackersloot* (ID:574), on arrival in Galle in 1647 after 11 years of service, was considered to be completely unseaworthy. The frames and other hull reinforcements were rotten. In the bow and on the portside, the ship had only survived on the strength of the pine outer layer of planking. The yacht was repaired as well as possible in Galle (NA 1.04.02, VOC, 1165, fol. 303-315v). The repairs kept the vessel afloat and it actually made a trip to Persia and then, after returning to Galle, took a cargo of cinnamon to Batavia. Following this voyage, it served for routine work in the Strait of Malacca. In 1651, it was decided that it was not worthwhile to spend any more money on repairs. Nevertheless, the *Ackersloot* made another trip, this time to Jambi to fetch a cargo of pepper. Finally in 1652, five years after the ship would normally have been considered to be unseaworthy, it was finally laid up.

A temporary insufficient cargo capacity was often the reason for using unsuitable or even unseaworthy vessels. Some of the vessels that were used at the end of their active service were literally floating on their cargo. In 1629, the ship *s'Landts Mauritius* (ID:337) leaked so severely that it could only make it back to Batavia by loading 148 beams into the hold to help it to stay afloat (Coolhaas 1953, p.1643). If a vessel was not deemed worthy of further repair, the VOC would take it apart to recycle the useable parts. This seemed to be an unpopular job with the sailors. In Banda in 1618, it was decided to demolish the ship *Wapen van Amsterdam* (ID:149) that had first come out to Asia in 1613, and the plan was to use the timber to repair and rein-

force the quays. The ship was in front of Fort Nassauw, where it had broken into three parts and:

> *'door malitie (soo wij menen) van de matroosen, die den arbeijt van t'sloopen vreesden, tot t'water bij nacht verbrant'* [by mischief (as we assume) of the sailors, who fear the job of demolishing, are [the remains] burned down to the waterline] (Coolhaas 1953, p.1276).

After as many useable parts as possible were salvaged from the ship, the remaining timbers were often burned in order to retrieve the iron nails (Coolhaas 1962, p. 132).

All homeward-bounders arriving in Batavia were inspected, after which it was decided whether the ship was fit to return. If not, this could mean that another use for these larger vessels had to be found in Asia. As discussed previously, these older Rate 10 ships could play an important role as well-armed vessels in the region of the Arabian Sea (see section 5.1.1). In some cases, ships were not fit for those purposes either: in 1631 the ship *Tholen* (ID:207) was inspected twice and judged unable to return to the Netherlands but also too weak to operate with heavy armaments near Surat and was therefore sent on an easy route to the Spice Islands (Coolhaas 1960, p. 281). If the ships were employed on the intra-Asian routes the heavy superstructure of the ships could be removed (NA 1.04.02, VOC 1113, fol. 344-346v). Eventually, these larger ships ended up as floating warehouses, carpenters ship or as floating fortresses in the Spice Islands (Coolhaas 1953, p. 1576).

Ships were also inspected in the Netherlands, but it is remarkable that, after the VOC established a regular building programme for the specialist homeward-bounders after 1620, very few of these ships ended their careers in the Netherlands. Sometimes ships that were considered barely able to make the trip from Asia back to Europe returned to Asia yet again and continued to serve there for many years (De Hullu 1904, p. 55).

Servicing the hull and other parts of the ships

The biggest hazard the VOC faced to sailing in tropical waters was the shipworm or *Teredo Navalis*. The *Teredo Navalis* was capable of assaulting the construction of a ship within a few months to such a degree that the main construction elements would lose their integrity and the ship would leak to such an extent that pumping could not keep the vessel afloat any further (Colenbrander 1919, p. 143).

From the earliest days of the shipping in Asia, various protection systems were employed (see Case Study 6-1). From the resolutions of the Chamber Amsterdam, where detailed technical issues were discussed, and from the bookkeepers' journals that listed the materials for the work on the hull, it is possible to gain an insight into the experiments that took place to find a new method to protect the vessel against the shipworm. The Dutch tried to protect their ships against the shipworm by applying an extra layer of planking over the existing submerged hull planking. In the first years this so called *verdubbeling* (sheathing) was sometimes placed in combination with a thin layer of lead underneath the extra layer of softwood planking. Later tar and hair were used for this purpose.

In 1603, it was decided that ships should be covered with a layer of lead and a pinewood layer on top (NA 1.04.02, VOC 225, 19-08-1603). In the bookkeepers' journal of 1604, the materials were listed for this work. For the ships *Amsterdam* (ID:33) and *Sonne* (ID:89), 207 rolls of thin lead and another 665lb of unspecified thin lead were required (NA 1.04.02, VOC 14336). In 1606, and again in 1615, it was decided that ships under construction would be build with an extra layer of oak and a top layer of pinewood planking without a layer of lead (NA 1.04.02, VOC 307). From 1606 on, hair was utilised between the layers of planking:

> 'Het grote gecochte schip doen verdubbelen met een eecken huyt daer haer onder geleyt is ende gespyckert boven op de tweede huyt ende daer weder haer op met een vuyren huyt wel becleet sonder loot' [The big ship that we bought is sheathed with oak planking under which hair was put and on the second planking nailed again with hair a pinewood

layer of planking well covered without lead] (NA 1.04.02, VOC 226, 02-01-1606, 06-01-1606).

The Admiralty ships that were sent to Asia in 1608 were sheathed and were protected on the vulnerable areas of the hull around the waterline 'between wind and water' by lead sheathing (NA 3.01.14, Oldenbarneveldt 3113).

Case Study 6-1. Sheathing

Many techniques have been tried over the centuries to prolong the life of ships' timbers. The Englishman Sir Richard Hawkins described those he knew, writing c.1620 about experience gained on a voyage which started in 1593 (from Markham 1970, p. 202).

'And for that I have seene divers manners of sheathing, for the ignorant I will set them downe which by experience I have found best. In Spain and Portingall, some sheate their shippes with lead; which, besides the cost and waight, although they use the thinnest sheet-lead that I have seen in any place, yet it is not durable, but subject to many casualties. Another manner is used with double plankes, as thicke without as within, after the manner of furring: which is little better then with lead; for, besides his waight it dureth little, because the worms in small time passeth through the one and the other.

A third manner of sheathing hath beene used amongst some with fine canvas; wich is of small continuance, and so not to be regarded.

The fourth prevention, which is now most accompted of, is to burne the utter planke till it come to be in every place like a cole, and after to pitch it; this is not bad.

In China, as I have been informed, they use a certain betane [probably bitumen] or varnish, in manner of an artificiall pitch, wherewith they trim the outside of their shippes. It is said to be durable, and of that vertue, as neither worme nor water peirceth it; neither has the sunne power against it. Some have devised a certain pitch, mingled with glasse and other ingredients, beaten into powder, with which if the shippe be pitched, it is said the worme that touched it dyeth; but I have not heard that it hath been usefull. But the most approved of all, now adayes in England, with thin bourdds, halfe inche thicke; the thinner the better; and elm better than oake; for it ryveth not, it endureth better under water, and yeeldeth better to the ships side. The invention of the materialles incorporated betwixt the planke and the sheathing, is that which avayleth; for without it many plankes were not sufficient to hinder the entrance of of this worme; this manner is thus: Before the sheathing board is nayled on, upon the inner side of it they smere it over with tarre halfe a finger thicke and upon the tarre anothe halfe finger of hayre, such as the whitelymers use, and so naylec it on, the nayles not above a spanne distance one from another; the thicker they are driven the better. Some hold opinion that the tarre killeth the worme; others that the worme passing the sheathing, and seaking a way through, the hayre and the tarre so involve him that he is choked therewith; which me thinkes is most probable; this manner of sheathing was invented by my father, and experience has taught it to be the best and of least cost.

Almost every ship that left the Netherlands for Asia was sheathed. Only if it was expected that a vessel would make a quick return trip, was the risk sometimes taken to send less protected vessels (see e.g. NA 1.04.02, VOC 99, fol. 716; 100, fol. 218). The quality of the sheathing the materials in between the layers, and the state of the main planking determined to a large extent the period a vessel could operate in tropical waters before it needed be sheathed again. The triple-layered method of planking described above was found on the wrecks of the VOC ships *Mauritius* (ID:66), 1609, and *Batavia* (ID:428), 1629, and the Anglo-Dutch yacht *Avondster* (ID:871). It has been suggested that, in the case of VOC ships, this construction is an adaptation for the specific conditions encountered in sailing between Europe and Asia, and also within Asia (Parthesius 1991; Van Duivenvoorden 2002; Parthesius et al. 2003). If the sheathing provided good coverage to the submerged hull, and if the materials were of good quality, the time the vessels could sail without maintenance to the hull could increase by several years. The cheaper pinewood served the purpose better than the more expensive oak because the ship-

worm preferred the latter above the softwood pine. To nail the sheathing with iron nails with big heads increased its effectiveness because the corrosion from the iron formed an extra layer of protection (Coolhaas 1960, p. 478)[50]. The purpose of the layers of hair and tar was to prevent the shipworm from reaching the main hull construction. Eventually every ship that sailed in Asia for longer then two to three years needed to have new sheathing.

Careening

The sheathing covering the planking below the waterline could only be applied when the hull was out of the water. For this purpose, the vessel could be careened, i.e. pulled over onto its side, so that the carpenters could work on the exposed surface. Facilities to dry the ship without pulling it on its side were limited in Asia where it was only possible in river outlets and bays in a region with a substantial tidal difference. Careening could, however, be done on every sheltered coast. The only thing that was needed was an '*op en neerhouder*' (up and down holder) from which the vessel could be pulled onto one side. Often an old vessel was specially kept near a harbour for this purpose; in 1641 the ship *Ter Veer* (ID:420) was sent on its last voyage to the repair wharf Onrust near Batavia for this purpose (Colenbrander 1889, p. 166). Sometimes, if circumstances required, active ships had to withdraw from shipping to help maintain other vessels (NA 1.04.02, VOC 1053, 26-04-1611; Colenbrander 1921, p. 707). In other cases, the vessels could only be partly repaired and sheathed (NA 1.04.02, VOC 876, fol. 553). It appears that the Dutch vessels were better designed for this practice than the English. Careening was used in the Netherlands as a common method to clean and repair the ship, as can be seen in the many paintings of harbour scenes. On the otherhand, the English ships were built and maintained in dry docks. In the first decades of the 17th century the English had problems with careening and lost two ships in attempts to renew the sheathing (Heeres 1896, pp. 28, 283). An official of the English East India Company wrote in 1618: 'The Dutch in Jayakarta sheathed three ships in 35 days, which are in the fleet off Mallacca, being at least 800 tons each. It toucheth our reputation too near that we should not be able to do it there as well as they' (Foster 1618, p. 34).

Partial careening was often practised to clean the hull of the barnacles that hampered the passage and speed of the vessel. For instance, the small patrol boats operating in the Strait of Malacca were regularly cleaned to maintain their speed. The big homeward-bounders were often delayed by the sea-growth on their hulls, but there was little that could be done about it. The VOC tried impregnating the underwater body of the vessel with a layer of grease and tallow in order to prevent the growth of barnacles. Often the ships needed to be cleaned after only several months at sea. If the occasion allowed, the ships were then partly careened to scrape them clean and burn a layer of *roet* (soot) on the outside. The products to do the cleaning and protection of the hulls were sent out on the ships to Asia.

Sheathing required a location where suitable timber and other materials were available and where carpenters could be housed. If the ships were completely careened, they had to be completely unloaded, which meant that storage capacity on shore was necessary. Already, before the establishment of Batavia in 1619, vessels were sheathed in the bay of Jayakarta and on the Spice Islands, but the English destroyed the facilities in the bay of Jayakarta on the little island of Onrust. The facilities were partially rebuilt, but in 1629 this infrastructure was again unable to be used because of the attacks by the Javanese, with whom the VOC was at war at that time (Coolhaas 1960, p. 268). Eventually Onrust would develop into a major maintenance centre.

From 1614 on, ships were careened in Japan and up to 1630 the VOC also had repair facilities at their disposal in Japan (Coolhaas 1952, p. 26). In 1625, the homeward-bounder *Wapen van Enkhuizen* (ID:249) was prepared for its return trip to Europe in Japan (NA 1.04.02, VOC 660, 04-1625). However, the Japanese authorities would soon limit the freedom of the Europeans. The crisis between the VOC and Japan over Taiwan around 1630, made the maintenance of big VOC ships virtually impossible. Middle-sized ships could be maintained on the Coromandel Coast, in Siam and in Arracan (Coolhaas 1952, pp. 93, 102; NA 1.04.02, VOC 660, 13-07-1627).

The VOC directors felt the need to control many aspects of the organisation, this extended to the choice of sites used for maintenance. They certainly did not want to spend too much money on the repairs in Asia if they could be done in the Netherlands. Vessels that regularly sailed back to Europe, *retourschepen* in particular were sheathed there, where enough materials and carpenters were available instead of using the more expensive and scarce resources in Asia. This policy also applied to bigger yachts and men-of-war, which, although they were due to stay in Asia longer than the *retourschepen*, were deliberately returned to the Netherlands for major maintenance. Governor-General Van Diemen (in Coolhaas 1947, p. 208) made the following recommendations in his report of 1631: 'construction and repairs to the ships in India cost the company big money and that the larger ships are not well maintained. It is therefore necessary that all substantial repairs to the ships will be exempt as much as possible and it be ordered that the precious men-of-war and the larger yachts should be employed at sensible times as homeward-bounders'. Smaller vessels could be maintained in Asia[51].

If sheathing to these ships was unavoidable, the VOC preferred to execute these works with their own people in Batavia. The logistical challenge was to have enough craftsmen, timber, tar, hair and nails available to sheath the vessel in a reasonable time. Given the extensive shipbuilding sector, this was not a problem in the Netherlands. In Asia, Batavia eventually became the best location for this work, since there was a regular supply of craftsmen and materials from the Netherlands supplemented with materials from the region, like *jatij* planks from Siam for the sheathing (Colenbrander 1898, p. 230).

Other repairs

Another common problem area was leaking at the waterline, or as it was known at the time 'the area between wind and water'. Here, the planking was easily affected by rot. This type of damage could have major consequences because it was generally only discovered when the vessel was heavily laden. More problematic was when the discovery was made at the time the vessel had already left the port and was heeling on one side at a given point on its course with the troubled spot submerged. The consequences could be that the ship took on water, which would make it difficult to sail and put the vessel under serious threat. This happened with the yacht *Avondster* (ID:871) when it left for the second time to the Netherlands in 1657. The yacht was discovered to leak severely when it sailed over a certain side. Eventually it was decided to sail back to Batavia because:

> '[…] desselfs ranck- ende leckheit, opdat bij voortzeijlen geroerde costelijck geladen schip ende soo veele sielen niet als voorbedachelijck den zee ten proije te geven'. [The instability and the leaking, by continuing the sailing this precious loaded ship and so many souls not by purpose to offer as a price to the sea] (De Hullu 1904, p. 105).

Whether a ship could sail was dependant on how the ship was loaded and also on the condition of the crew – if they were not fit enough to pump the ship dry then the ship was lost (Coolhaas 1953, p. 1661; Colenbrander 1923, p. 732). Repairs, by the onboard ships' carpenters, were reasonably simple following partial unloading or careening the vessel. However, it was first necessary to reach a port or anchorage. If the whale, a heavy construction element on the outside of the ship, had to be replaced more specific skills for handling heavy timber and materials were required.

The ship's internal construction was also in need of regular maintenance. One of the biggest problems for the VOC was dry rot (decay of timber by fungus) exacerbated by the humidity in the packed holds under tropical conditions. The only remedy – ventilation and pickle – was difficult to combine with the VOC policy of keeping their fleet sailing rather then have it waiting empty in a port. Only in the Netherlands could vessels stay idle for a longer period. In Asia the VOC must have weighed the cargo capacity against the longer lifespan of their fleet.

Construction problems could also occur inside a vessel due to heavy sea conditions. In 1655 the flute *Trouw* (ID:811) was caught in a storm near Taiwan. Apart from the external damage,

various deck beams and deck planking of the orlop deck came loose and knees broke (Blussé, Milde & Ts`Ao Yung-Ho 1995, p. 754). Another cause of internal damage could be the firing of heavy cannons. An example of that is the ship *Erasmus* (ID:60) that:

> 'met alle dit schieten soo verswackt ende ontramponneert / dat het te verwonderen is / also veel balcken / knien / inhouten / balckhouten / 't welck de principale stijfte van 't Schip maken / in stucken geschoten zijn' (was with all the shooting so weakened and destroyed, it is a wonder that, so many beams, knees, [and other internal timbers] that normally gives the ship its strength, has been shot in pieces (Commelin 1646a, p. 182).

Once again this type of repair required specialist materials and expertise. The *Erasmus* did not make it to the Netherlands and was left behind at Mauritius. The leaking of the *Dolfijn* (see Case Study 6-2 in section 6.6) was probably caused by combat near Taiwan.

Supply of materials for maintenance

The regular supply of the requisite materials was essential for the maintenance of the fleet. Most of these products were shipped from the Netherlands and therefore impacted on the cargo-carrying capacity of the outbound ships. There was a constant need for all shipping related products such as rope-work, sails and anchors. Naturally, the VOC tried to find local products that could replace the European materials but, according to their judgement, the quality was unacceptable and the price too high. The VOC in the Netherlands liked to control the deliveries and, of course, the associated profits. Where items such as timber and anchor cables made shipping from Europe impractical due to their sheer bulk, the supply of these items was sought in Asia. The VOC was the main transporter of spare materials that were exclusively intended for use on board their own fleet. The regulation of the required quantities and qualities needed in Asia compared to what was actually sent was an ongoing issue of concern for Batavia. In 1628, Coen complained (as he usual did) that there were too few ships in Asia and that, therefore, his warehouses were packed with spare materials: 'Now that we have no ships here are the warehouses full with big cables and heavy anchors' (Colenbrander 1923, p. 130). In 1647, Governor-General Van der Lijn indicated that spares available were insufficient for the fleet and that through: 'deficiency of these the Company would suffer big disadvantage and would fall into scarcity' (Coolhaas 1964, p. 306).

For anchor cables the VOC tried to utilise local products. From Surat and Coromandel the so-called *vijger* ropes were imported to Batavia but as it turned out they did not meet VOC standard. In 1625, Batavia asked for more ropes from the Netherlands because those from Surat were inadequate owing to the speed with which they rotted and yet still cost 4000 guilders (NA 1.04.02, VOC 1086, fol. 54). Good quality hemp rope was available in Japan, but the problem still existed in that there was no tar available to impregnate them (Coolhaas 1952, p. 311). The superiority of the European products (with associated economic benefits) was evident throughout the whole period under study. After the VOC established itself in Ceylon and on the Malabar Coast, enough *cayer* rope (made from the outer fibres of the coconut) was available, but large quantities of hemp rope was still shipped to Asia. There is evidence to suggest attempts were made to produce rope with local raw materials. In 1642, two years after the fortified city of Galle on the south tip of Ceylon was captured from the Portuguese, a request was made for European ropes to be sent via Batavia (NA 1.04.02, VOC 1144, fol. 92-93). In 1646, the VOC established a ropewalk in Galle where mainly the heavy anchor ropes were produced from the local coconut fibres (NA 1.04.02, VOC 1162, fol. 269). Around 1648, Galle had become almost self-sufficient in their rope production and only lighter ropes were requested from Batavia. They even produced enough to send ropes to Batavia. These ropes were reasonably well received, and though Galle produced fuses, these however, failed to meet the VOC standard (NA 1.04.02, VOC 872, fol. 299).

The development of Japan as a regional centre of maintenance where Asian materials and expertise were available looked promising for a while. The head of the VOC in Japan, Jacques

Specx, in particular was the driving force behind this development. Coen, however, saw in this a threat to the development of Batavia as the central point in Asia. In arguing against the development of Japan, he indicated that maintenance costs in Japan were too high and that there was too little control over expenses. In the 1610's, the VOC had set up a ropewalk and even cast wheels for blocks in Japan (Colenbrander 1920, p. 115; Coolhaas 1953, p. 502). In 1614, the VOC completely refurbished and refitted the Junk *Fortuijn* (ID:156) with a Dutch rigging. Specx was aiming for a regular maintenance programme for VOC vessels rather than ad hoc repairs on passing ships. This would justify the available facilities and craftsmen (Coolhaas 1952, p. 6). The competition between Coen and Specx was dissolved by the political tension between the VOC and Japan over Taiwan. When the Dutch had regained a favourable position in Japan, Batavia was definitely established as the centre of all intra-Asian activities.

Hemp from Bengal was shipped in large quantities to Batavia where in c.1660 the VOC established a yarn spinning mill and a sailcloth-weaving mill. This project was not a success due to a lack of manpower and problems associated with the huge cargo capacity (volume) that was needed to ship over the raw materials from Bengal (Stapel 1943, p. 430). An attempt to establish a weaving mill in Bengal was also unsuccessful (Stapel 1932, p. 157).

Nails for the sheathing and other maintenance work were annually requested from the Netherlands by Batavia. VOC posts requested barrels of nails, coils of rope and bundles of sailcloth from Batavia on a regular basis. These were intended for passing ships that had used their stock of spare materials. The production of ironwork was attempted in Coromandel but again dismissed due to the high costs and uncertain quality.

The VOC was overall dissatisfied by the quality of the Asian products. It is unfortunate that they were unaware of some special qualities of the local products, such as locally used woods that had better resistance against shipworm attack. An awareness and understanding of local materials and their use could have helped solve some of the VOC's logistical problems (Coolhaas 1952, pp. 16, 241; Coolhaas 1960, p. 458; NA 1.04.02, VOC 1231, fol. 777v).

The spars and masts were essential parts of the VOC shipping machinery amd sourcing them locally caused specific problems. In times of distress, it was possible to retrieve a mast from a forest but, for common use, the Asian masts were considered unsuitable. Timber from Mauritius was too heavy, too 'green' and cracked when dried (NA 1.04.02, VOC 1056, fol. 200v). Although a mast from the Moluccas turned out to be satisfactory, in general, despite some experiments with jatti wood, most Asian timber was deemed to be useless (Coolhaas 1952, p. 551; Stapel 1927, p. 526).

The bottleneck to the availability of European spars again lay with transport. The ships needed some special fittings to load and unload this cargo. Timber that would be long enough for spars and masts could only be loaded through a special hatch in the stern of the ship – the *lastpoort*. The normal hatch in the deck allowed loading of larger barrels, cannons and anchors, but were limited in size by the deck beams, which could not be more broadly spaced without undermining the integrity of the hull construction. The *lastpoort* was common in the stern of flutes with their big empty holds, they were however more difficult to include in the larger VOC ships with their various chambers for storage of weapons, bread and powder and other accommodation. In some instances, masts were loaed on the *koebrug* (the deck in the hold), but here they passed a danger to the stability of the ship due to the increased weight higher in the ship (Stapel 1927, p. 526; Witsen 1690, p. 178). For transport in Asia, older ships were sometimes fitted with a *lastpoort* (NA 1.04.02, VOC 1219, fol. 801v). These ships were sent to destinations like Siam, Jappara, to the coast east of Batavia and to the Spice Islands. The timber collected there was also used in the construction of buildings at the VOC settlements.

Loading the fleet: ballast and cargo in Asia

Finding the balance between profitable cargo and necessary ballast was a complex issue in Asia. Many Asian products like spices and pepper were very light and could therefore only be shipped in combination with heavier cargo or ballast. The availability of profitable ballast was a constant concern, especially since the VOC was rather peculiar about the return they expected

back: 100% was considered the minimum profit for these ballast goods that were not perishable and that could be stowed underneath the cargo-floor (so it would not reduce the cargo capacity!) (NA 1.10.30, Archief Geleijnessen de Jongh 18, p. 37). However, it was not always possible to find 'paying ballast'. The fact that ballast was inaccessible for a prolonged period before it could be sold, made the VOC consider the financial losses in this type of trade. Stones turned out to be efficient ballast because it cost the VOC only the labour to collect them and these materials were useful at most destinations. Also the bricks transported from the Netherlands and other stone building materials were used as ballast in Asia. A striking example of this is a well-known portico for Batavia found on the wreck of the ship *Batavia* off the coast of Western Australia. Tombstones were also transported from the Netherlands, such as the 430 tombstones of three by seven feet that were requested for the new church in Batavia in 1643 (Coolhaas 1964, p. 218). Coral stone was also used as a building material; it was only shipped in older ships because of the possibility that the sharp stones would damage the cargo floor (De Hullu 1904, p. 288). The simplest form of ballast was sand but this product was only used as a last resort, as in the event of leakage, water would be difficult to pump out and identifying the source of the leak was impossible (Elias 1933, p. 88). Sand was used on the *Avondster* (ID:871) when no other products were available to make the vessel stable (SLNA, 1/3378, 09-11-1657),

On a logistical level, the difficulty in the choice of ballast goods lay between the importance of short loading and unloading periods in combination with the unloading of the ballast from underneath the cargo floor. It was not uncommon for saleable ballast to remain in the ship, even when replacement ballast was available, due to a lack of sufficient time for the unloading and reloading (Coolhaas 1952, p. 476).

Assembling the ballast for the fleets bound for Europe was also an important assignment for the Asian organisation. For the homeward-bounders, the VOC organised ebony wood from Mauritius (NA 1.04.02, VOC 100, fol. 218), saltpetre from Coromandel and Bengal (Colenbrander 1919, p. 582, 1619), copper from Japan (NA 1.10.30, Archief Geleijnessen de Jongh 18, p. 37) and sugar from Taiwan. These products also served as ballast goods for the vessels sailing from these places to Batavia. Ships sometimes sailed specially via Mauritius to collect ebony, which was considered very useful and practical ballast. It could be obtained without cost from the woods on Mauritius. It could be sold for a good price in Europe and was not perishable. It could also be stowed directly on the inner planking of the hold in between the frames without utilising any of the cargo space (Colenbrander 1922, pp. 347-348). In that respect saltpetre and sugar were problematic. A separate type of ballast was the broken anchors and cannon that were shipped back to the Netherlands for recycling. The quantities of these could be large; as for example, in 1627 when 62 cannon were shipped back to Europe (Colenbrander 1923, p. 260).

Local goods could be used as ballast between destinations within the intra-Asian shipping network. Sugar was used between Taiwan and Japan. Stone ballast was used to destinations where useful ballast could be acquired, for example vessels travelled to Japan with stone and returned with copper. As with grain in Europe, rice could be shipped without additional ballast. Rice was much heavier than the spices and pepper, and thus a ship that was only partly loaded with rice was stable enough to take an additional cargo of these lighter products. Rice was, for this reason often loaded as useful ballast product on intra-Asian routes (De Hullu 1903, p. 321).

Crewing the fleet in Asia

During early shipping, problems encountered with the crew were due to long intercontinental voyages. Within Asia, owing to the longer voyages and more hostile circumstances relative to routes in Europe, also a larger crew was required. The developing intra-Asian shipping network required a considered policy regarding the manning of vessels. On Asian routes, the size of the crew that was capable of manning the vessel did, on a number of occastions, drop below a critical number[52]. The aim of the organisation was to have a reasonable surplus of crew in order to buffer against unforeseen circumstances. Crewmembers falling ill was hardly an unforeseen circumstance and, therefore, the VOC established hospital facilities strategically lo-

cated within the intra-Asian network: first in Batavia and later at Ceylon. Sailors who had recovered would replace incapacitated crew arriving at a certain trading post; often other staff were placed on board passing vessels.

Of course, many of the nautical tasks onboard could be conducted by other staff. However, the safe operation of the fleet was imperative and depended on the presence of sufficient qualified staff: sailors that could sail the ship, skippers and navigation officers that had knowledge of the sailing areas and ships carpenters and boatswain that could repair the ship during the voyage. The *Witte Beer* (ID:152) , on route to Asia in 1615 experienced problems due to a lack of specialised crew; the upper-steersman died, the skipper turned out to have no navigational skills at all and those on board had to rely, for a safe voyage, on the accompanying yacht *Swarte Beer* (ID:153) (McLeod 1927a, p. 152).

Only occasionally did the VOC use the services of local sailors, one example is the ship Wapen van *Delft* that sailed to Batavia in 1627 with a local steersman. The VOC preferred to sail their ships with a European crew and there was never a policy to employ local sailors (NA 1.04.02, VOC 677, 08-09-1654). This policy of a European crew in combination with a relatively high mortality rate, forced the VOC to transport large numbers of sailors to Asia and to various posts in the Asian network. Apart from the crew, other passengers were present on board during most voyages. Soldiers, administrative staff and management were also shipped from the Netherlands and then employed in the many VOC forts and trading posts. Soldiers and other staff were regularly transferred. Military personnel were often moved around in the region in anticipation of military activities. Therefore, the number of people on board the ships in Asia generally exceeded the required crew.

Food and supplies for the people on board were an important aspect of the logistical organisation of intra-Asian shipping. However, even with a larger number of crew and passengers, it was possible to make almost all voyages within Asia without having to make a stop for food supplies. Only the longer voyages over the Indian Ocean to Surat and Persia and back could be tight (Coolhaas 1953, 18-4-1629). Shortages in drinking water did, however, create problems. The water supply would become critical especially if the ships were used for the transport of Portuguese prisoners or slaves. The ship *Den Briel* (ID:385) had to call at Jortan to take on water when it transported '150 souls of slaves (male and female) very skinny and poor destined people' 25 of which died within a short time (Coolhaas 1953, p. 1291). The transport of groups of Portuguese prisoners created the same problems, as did the transport of animals like elephants and horses. For the transport of elephants, ships had to make refreshment stops to provide fresh vegetables (Colenbrander 1902, p. 8). The large volume of water that had to be transported created a new problem for the VOC: the wooden water-barrels normally used weren't suitable in the tropics. Asian storage pots (martavans) provided the solution (Stapel 1927, p. 550). This type of container is described in the VOC archives and was excavated from the wrecks of the *Witte Leeuw* (ID:124) (Pijl-Ketel 1982) and the *Avondster* (ID:871) (Parthesius 2003). In 1658, the *Leeuwin* (ID:887) and the *Der Veer* (ID:893) had to transport 449 Portuguese prisoners (193 male, 156 female and 100 children) to Batavia, for the storage of drinking water a 'fair amount' of martavans were placed in the hold (NA 1.04.02, VOC 1227, fol. 73-74).

The preparation for and the employment of the required sailors to be sent to Asia to serve on the ships was a logistical challenge that must have been mind-bending for both the directors in the Netherlands and the management in Asia. Before 1620, there was a constant shortage of sailors who remained in Asia with the fleet. The VOC forced sailors to serve longer in Asia than their contract stated. The active policy of Governor-General Coen to establish colonies and to privatise aspects of the Asian shipping network should be seen in the light of this problem (Colenbrander 1918, p.796). In 1633, this bottleneck had not been lifted and there was still a shortage of staff for the Asian fleet. Governor-General Brouwer complained that they had an excellent fleet of ships in Asia but that through a lack of staff 'these marvellous ships can not contribute to the benefits of the VOC and to be detrimental to the enemy' (Coolhaas 1960, p. 393). By the 1640s, the problem with sailors reluctant to stay longer in Asia must have been solved because in 1648, the arriving sailors were returned immediately with the fleet to Europe. At this time, the VOC could not recruit enough sailors in Asia that were prepared to sail back to Europe. There was discussion as to which staff would serve the VOC's interests best in Asia: the

'old staff', those who had been in Asia for some years being both experienced and acclimatised, or the new arrivals coming from Europe. Governor-General Van der Lijn clearly favoured keeping the old staff in Asia in concluding his letter to the VOC directors on this subject he wrote:

> 'Echter verstaen wij dat de Comp van 't oude volck in India meerder dienst can trecken, als van nieuw in 't landt comen ende dat het evenveel is, off de retourschepen met out ofte nieuw volck thuysgebracht worden' (We understand that Company receives better services in India from the old people, than the new coming into this country and that it is alike, that the retourschepen is brought home with old or the new people) (Coolhaas 1964, p. 370).

Despite all the complaints about the availability of staff, the management seemed to have been able 'to tie the ends together' because there are only a few references to ships being laid up for a period owing to a lack of crew. If there was not enough crew for a longer voyage on a more demanding route, there were still plenty of possibilities for finding employment for a ship. A ship could be sent on a short or easy trip where a smaller crew was required. No records were found in which the loss of a ship was directly ascribed to a lack of crew. Vessels could, however, face serious problems if illness or exhaustion reduced the number of capable crewmen. Sometimes it was not possible to continue to manoeuvre the vessel – as was the case for the flute *Reiger* (ID:808) which drifted past Galle because the crew could not sail the vessel into the bay (NA 1.04.02, VOC 1214, fol. 295). Most of the time the vessels under threat could sail on easy courses with the trailing wind to friendly coasts or destinations to seek help. The minimum crew that was required to sail the vessels was remarkably low (that means operate the vessel in a technical sense). The minimum crew size ranged from less than 10 to 15 for the smaller yachts[53], and from 30 to 40 for the larger vessels[54]. As the rigging was divided over more masts and many sails, this made it lighter and easier to operate. Serious problems were caused if the heavy anchor needed to be handled under difficult circumstances. Often a short-handed crew had problems weighing anchor, they would have to ask for assistance from other ships or cut the anchor cable. It could be fatal if the crew was not able to pump out incoming water and therefore, the vessel had to be abandoned. Striking in this respect is the history of the *Dolfijn* (ID:903) that sank at the entrance of the Bay of Galle in 1663. The yacht had arrived from Surat leaking seriously and had anchored awaiting instructions from the shore. Although it was still possible to save the ship by sailing it into the harbour, the yacht sank because the crew was too exhausted to weigh anchor after many days of constant pumping (see Case Study 6-2).

Case Study 6-2. The wrecking of the Dolfijn

Although the *Dolfijn* was leaking when it had called at Surat in 1663, the local VOC official did not allow the crew to conduct any repairs. He ordered the skipper to sail to Galle to make his needs known there. There is a certain logic to this since Galle was developing as a logistical centre for the VOC. However, when the commander wrote a letter about the rich cargo they were about to send with the *Dolfijn* to Batavia, his wish that 'The almighty would bring this [ship], free from disasters to the right destination' was not granted (NA 1.04.02, VOC 1239, fol. 1693). Understaffed and leaking, the *Dolfijn,* with a rich cargo, left Surat in northwest India for Galle on 28th April 1663.

During the voyage, the crew had to pump, day and night, to keep the ship dry. On the third of May, the skipper discussed their difficult situation in the '*scheepsraad*' (council of officers). On arrival at a VOC post on the Indian coast, the *Dolfijn* asked for assistance from a Dutch merchant stationed there. The *Dolfijn* requested 20 to 25 local men to pump the vessel in case of emergency. The locals, however, asked too high a price: one *pagood*[55] per month, free water, firewood, and rice, plus the use of a galley and six months' pay in advance. The ship left for Cochin without assistance, but with 32 packets of opium. The *Dolfijn* arrived on May the 10th, '*lek maar behouden*' (leaking but safe). Once again a request for assistance was turned down. The ship was told to sail on to Galle, and her problems intensified.

On May 14, the ship was near Galle, in bad weather, when the leak worsened. In order not to miss the entrance to the Bay of Galle, the skipper decided to anchor in thirteen fathoms of water. To keep the ship dry, the crew deployed a fourth and a fifth pump. When the time came to sail, the crew were so exhausted after constant pumping that they were unable to lift the anchor, and had to cut the rope. The *Dolfijn* sailed to the entrance of the bay, where they again anchored, and fired several guns as distress signals. The situation became untenable, five pumps were not enough to keep the ship afloat and buckets were also needed. The only sensible course of action was to sail the ship into the bay as quickly as possible in order to save the crew, money and cargo. Again, there was a problem in lifting the anchor, because the crew were either fully occupied with pumping or were completely exhausted. Another problem arose when the pilot came on board. He explained that it was impossible to enter the bay because the ship was lying directly in front of a shallow reef and the wind was not favourable. Aware of the seriousness of the situation, the VOC sent help on a sloop from the shore, but by the evening the ship had to be abandoned, since water was already lapping the galleries at the side of the cabin. In a final attempt by the skipper of the *Dolfijn* to save the money, he loaded the chests on the sloop. However, when he heard the moaning and shouting of the crew still on board he realised that it would be impossible to save both the men and the money. The situation became critical when more and more crewmen jumped on board the sloop, endangering both the cargo and crew, so the skipper threw twenty chests overboard. When the crew were safe, the skipper went back on board, risking his own life, to pick up the last six chests of money from the upper deck of the sinking ship. After he had handed over the chests, he fell overboard and was already drowning when someone rescued him with a hook. Injured but alive, the captain and crew could do nothing more than watch the *Dolfijn* go down. By the next day, only the tops of the masts could be seen above the water.

Being the third ship in four years to be wrecked in sight of Galle, some procedures for dealing with disasters must have been in place. People were therefore probably not too astonished to see, days after the shipwreck, a man in the company of VOC officials carrying a strange device of leather hoses and leaving the fortified city for a diving experiment in the bay. In late May 1663, some of the dignitaries of Galle had condescended to be present at a demonstration by a man who claimed that he could dive to deep sites using a leather hose for air supply. The test was conducted with a hose seven and a half fathoms[56] long that was tightly wound around his arms and probably connected to a bodice pulled over the upper part of the body. Expectations and hopes were high, if the trial was successful, the VOC could salvage some of the four and a half 'tons of gold', i.e. 450.000 guilders[57], that were lost when the ship was wrecked on 15 May 1663 (NA 1.04.02, VOC 887, p. 305). This sum, being equivalent to the annual profit of the important trading post Surat, was huge by contemporary standards (Coolhaas 1968, p. 459). The demonstration turned out to be very disappointing; soon after the diver was lowered into the water he signalled that he wanted to be pulled up. In the diary of one of the officials present, the situation was explained thus: 'because by binding the weights to his body to make him sink he was too suffocated and incapable to accomplish his mission.' (SLNA 1/2712, fol. 238). The diver also claimed that the water had entered the hose and the bodice[58]. The conclusion was clear: this diving device would not be the solution to recover the twenty chests of money from a depth of twenty-five fathoms. The VOC officials must have been desperate because a few days earlier an unsuccessful attempt to salvage the money was made. On that occasion, the officials sent a corporal by boat to the site where the *Dolfijn's* topmast was protruding from the water. On the wreck site, the corporal used his specially designed long drill to reach the money chest sitting on the seafloor. This attempt failed too: the long drill broke due to the great depth and the rough seas and also because the ropes, sails and broken masts blocked the way (SLNA 1/2712, fol. 220, 230). In the hope of retrieving some of the cargo, the VOC posted guards on the fort and the beaches in case some of the valuables washed ashore.

It is surprising that the archives do not reveal an attempt to salvage the chests of money from the *Dolfijn* with the assistance of pearl fishers. On other occasions, they were used to salvage valuables from shipwrecks. For the salvaging of money from the *Batavia* wrecked in 1629 on the Houtman Abrolhos off the west-coast of Australia, pearl divers were specially brought there from Batavia (Roeper 1993, p. 21-22) These divers were called 'Guseraten' (from Gujarat in India) (Colenbrander 1921, p. 757).

A possible explanation of why the VOC relinquished the money can be found in a description by a 17th century VOC official of fishing pearl and chank shell (used in Hindu and Buddhist rituals) in the Gulf of Tutucorin. According to Joan Nieuhof, who was involved in the pearl fishing industry as a VOC merchant in the 1660's, fifteen fathoms was the maximum depth the divers could reach. 'The local divers are able to dive four times longer then our own people. They are able to dive to a depth of three to fifteen fathom but not deeper […]' (Nieuhof 1682, p. 190). According to another 17th century observer, the divers reached a depth of ten fathoms (Baldeus 1672, p. 151). The wreck of the *Dolfijn* at a depth of 25 fathoms would have been too deep.

7

Knitting all the threads together: the logistics of the network

Batavia as the spider in the web of logistical organisation

West Java and Sunda Strait had been, since the commencement of regular Dutch voyages to the Asiatic region, an important place of call, but it was certainly not self-evident that this location would become the headquarters of the VOC from which all activities would be coordinated. Even in 1619, when Jayakarta was captured as an outcome of the skirmishes with the English, it was not clear if the VOC directors would reach the consensus that central rendezvous was necessary. The focal point of the Dutch activities in Asia for the early period was the Spice Islands. There was a monopoly on the spice trade to be gained subject to the use of force to exclude European and Asian rivals from the market. All other Asian products for both the barter trade on the Spice Islands and for the European market could be obtained on various locations throughout Asia. Pepper, the most important product in 17th century trade to Europe (in terms of volume), was already purchased prior to 1610, by the Dutch at different locations such as Bantam on West Java, Atjeh on Sumatra, Patani on the east coast of the Malaysian peninsula but also Johore, South Borneo and the west coast of India. Pepper was a product in demand, which could be obtained in large quantities and used at all times to load the holds of the European bound vessels. The big profits were, however, made through the trade in spices. Although the strategic interest to obtain these goods for Europe was centred on the Spice Islands, this location was impractical from a purely nautical point of view. Due to the monsoonal cycle, the Spice Islands were only accessible for six months a year while return shipping was only possible the other half of the year. This made it difficult to assimilate this location, from which the VOC had to obtain their barter goods in order to acquire the spices, into the intra-Asian network.

Although the Spice Islands were the VOC's political-military centre in the 1610s, the region at Sunda Strait served as a transhipment centre due to the suitability of its location as a shipping link between Europe and the intra-Asian network. Shipping contacts in the northern part of the Indian Ocean could be maintained all year round through the Strait of Malacca or the Sunda Strait. The ports of the Sunda Islands that face the Sea have relatively sheltered conditions with the effects of the monsoons diminished compared to other Asian shores. From the earliest Dutch voyages to Asia, ships could expect to find good anchorage here and a place to assemble their fleet. Early in the 17th century, the need for a warehouse arose; a place to store goods to be reloaded onto other ships. In 1604, Wybrand van Warwyck, the Admiral of the first VOC fleet, was allowed a stone building and a yard in Bantam. The problem with this location was, that Bantam charged high import and export taxes. A location with the same logistical advantages but independent from the local authorities would have been ideal for the VOC. When Governor-General Both, the first in the region, was appointed, the infrastructure to facilitate the separation of VOC shipping into European-Asian and intra-Asian did not exist. The political-military centre was, as a consequence located in the Spice Islands; it was the end of the 1610s when the Dutch secured their position in the eastern part of the archipelago. Governor-General Both therefore went directly to the Spice Islands when he arrived in Asia. In addition, a lower

placed director-general (responsible for the trade and the shipping) tried to organise the logistics of the intra-Asian trade and the *retourvaart* to Europe while travelling back and forth between Bantam and the Spice Islands.

The focus on the region of west Java intensified when, in the 1610s, a new direct route between the Cape of Good Hope and Java was explored. Instead of following the African coast to the north, the ships sailed south and then east between 35º and 40º S latitude, using the prevailing westerly winds, the roaring forties and the current. After approximately 1000 Dutch sea miles[59] ,they turned north towards the Sunda Strait between Sumatra and Java. This new route was successful: the trip was shorter and the conditions improved for both ship and crew. In 1616 this route, 'Brouwer's Route' became the prescribed route for all VOC ships. Initially, there were problems with knowing when to turn north and off the 'roaring forties freeway'. Although the 17th century sailors were able to determine the latitude of the ship, the longitude was based on dead reckoning by the skipper and mates. The accidental grounding and the wrecking of the *Batavia* off the coast of Australia in 1629 was partly due to a miscalculation of longitude. Another problem with the route was if a ship arrived in the monsoonal season on the wrong side of Sunda Strait, it was forced to sail with the winds for some months before it was able to reach its destination. With fine-tuning of the routing and growing cartographical knowledge of the west coast of Australia, Brouwer's Route became the best route.

Prior to 1618, the VOC's preference was for Jayakarta to be the administrative centre and a place for storage and transhipment, this was mainly due to the dispute with Bantam over taxes. The bay of Jayakarta with the 'thousand islands' was ideally suited for both shipbuilding and repair. The combined attack of the English (triggered by the VOC themselves, as a result of their aggressive monopoly policy in the Spice Islands) and the Javanese on the initial VOC post in Jayakarta turned out to be a blessing in disguise. After the VOC regrouped at the Spice Islands they were able to recapture Jayakarta and establish a sound independent base. This independence ultimately led to the establishment of VOC headquarters at this location. Whilst the VOC were no longer required to pay taxes and duties on their trade, they did, however have to deal with hostile neighbours. Nevertheless, as long as they were able to control the situation by 'dividing and ruling' and as long as they were able to keep ahead in military strength, they could develop their logistical centre without interference from the local rulers.

In 1619, Jayakarta was renamed Batavia by the VOC forces led by Jan Pieterszoon Coen. After 1620, Batavia became the administrative and logistical headquarters of the VOC. From that time, all major decisions relating to administration and logistics were made there. The Sunda Strait became the central hub for the link to Europe and Batavia and was, in effect, the 'traffic-control-centre' for intra-Asian shipping. The departing ships regularly received detailed instructions about their voyage and goals. Batavia VOC officials often diverged from these instructions when the specific vessels were not available. It seems that the VOC was able to control shipping and trade to a large extent. If unforeseen circumstances occurred, it appears the system was flexible enough to adjust to the situation as demonstrated in the reconstruction of a planned and implemented season of intra-Asian shipping (see Case Study 7-1).

Case Study 7-1: Orders and Obeyance , Taiwan 1650

The orders and the obeyance of orders sent from VOC headquarters in Batavia demonstrate the flexibility of the VOC. An interesting case study is the implementation of instructions for the ships on the north-eastern route sent in 1650 to Taiwan.

These instructions for the Taiwan VOC post were sent with the homeward-bounder *Nieuw Enckhuysen*[60] on 25-7-1650 (NA 1.04.02, VOC 874, fol. 25). Once in Taiwan, a ballast-cargo of sugar was loaded and the ship returned directly to Batavia. In Batavia, an additional cargo of pepper was loaded. The ship had arrived late and could not join, as planned, the return fleet which had departed on 11th December 1650. It left with 3 other 'late' ships on 21st January 1651. The *Nieuw Enckhuysen* arrived in the Netherlands in August 1651.

The instructions that the *Nieuw Enckhuysen* brought to Taiwan included a number of assignments for a

number of vessels.

The flutes *Witte Duyf*. *Witte Paard Overschie*, *Trouw, Os* and *Koe*[61] were listed in the instructions with the assignment to sail directly from Taiwan through Strait of Malacca to the Bay of Bengal and the Arabian Sea and to return to Batavia. The *Witte Duyf* disappeared and never reached Taiwan to even receive the instructions. The other ships apparently made their voyage as ordered, arriving in Batavia between May and September 1651.

The instructions also included orders that the flute *Swarte Beer*[62] return from Taiwan as fast as possible with sugar for ballast for the return fleet waiting in Batavia. This order was not followed, apparently because the flute could not reach Batavia before the expected departure of the fleet to Europe. Another explanation is that local VOC officials were reluctant to employ this flute on 'ordinary' sugar transport; in a travel journal of 1645 the *Swarte Beer* was praised for its 'excellent features' (Plas 1955, p. 26). The *Swarte Beer* eventually sailed from Taiwan via Tonkin (Vietnam) to Japan and via Siam to Batavia. The sugar that the *Swarte Beer* was assigned to carry to Batavia, was probably shipped by the flute *Santdijck*[63].

The *Santdijck* was one of four flutes instructed to sail, as a fleet, from Taiwan via Siam to Batavia. Only the *Hillegaersberg* sailed the prescribed route. The S*antdijck,* in August 1650, sailed directly to Batavia to meet the return fleet. The *Pellicaen* stayed near Taiwan and sailed directly to Batavia much later, in February 1651. The last flute, the *Potvis*[64] was lost on its outward voyage to Taiwan.

VOC officials ordered two other ships already in the region to take the place of the missing ships on the route Taiwan-Siam-Batavia. The yacht *Hulst* and the *Maasland*[65] replaced the flutes *Pellicaen* and *Potvis*. The flute *Maasland* had been involved in local trade between Taiwan and Tonkin since 1649.

Four other vessels included in the instructions did not call in at Taiwan on their outward voyage from Batavia to Japan. The flute the *Liefde* sailed via Siam on its outward, as well as, homeward voyage, although a stop in Siam on the return voyage was not included in the orders from Batavia. Together with the homeward-bounder *Vrede*[66], the *Liefde* was in Batavia on time to ship Japanese cargo to Europe. The *Vrede* did not sail back to Europe. In the East Chinese Sea, its masts had to be cut in a furious storm. The ship was repaired in Batavia and sailed with the next return fleet at the end of 1651.

Another two vessels, the flute *Koning van Polen* and the yacht *Robyn*[67] did not call in at Taiwan, but sailed directly to Japan. The return voyage was, as ordered, via Siam to Batavia. The *Koning van Polen* carried a cargo of Siamese rice to Malacca before returning to Batavia, the *Robyn* left some silver in Siam to buy new cargo from Japan and returned with the remainder to Batavia.

Two more flutes sailed from Batavia on the north-eastern route in 1650. The *Kampen* and the *Witte Valk*[68] were ordered to work the silk-trade between Tonkin and Japan. They indeed did stay in this region, the *Witte Valk* even until 1653, before returning to Batavia.

With the damage to the *Vrede* and its temporary unavailability a replacement was necessary, which prompted an evaluation of the fleet by VOC Batavia. In addition to the *Vrede,* the ships *Nassauw*[69] and *Wesel*[70] were not available for the fleet. These ships were decommissioned on the easy route to the Spice Islands and were resepectively demolished there and used as a timber carrier. Due to the absence of these ships, there were no suitable *capitael* (large) ships available for: shipping in India; the blockade of Goa; and the inevitable war with Portugal. It was suggested that the place of the *Vrede* should be taken by the flute *Reiger*[71].

[The directors in Batavia made the following assessment of their fleet which provides an insight into their view of the VOC shipping capacity in Asia and their efforts to optimise the shipping organisation.]
In Asia are:

5 ships: *Vrede, Snoeck, Maastricht, Nassouw, Banda* […] 29 yachts small and big, under which 7 that are almost off. 23 flutes of which 10 almost off, 2 refurnished Moorish yachts that sail between the trading posts at the Coromandel Coast, 3 stone carriers, 12 *chaloups*, *joncks*, pilot boats etc, this are vessels that are no part of the intra-Asian trade and are only used for communication and assistance with loading and unloading.
They request a number of 60 swift sailing flutes and yachts of 150 to 300 *last* to operate in the shallow waters of Tonkin, Taiwan, etc. Also 6 strong and very swift sailing *galjoten* are required for Ceylon and the river Ganges but also especially for the canal of Taiwan. They mention the possibility to build *chaloups* in Asia but according to them there is a lack of compass timbre. (Coolhaas 1964, p. 464)

The stranglehold that VOC Batavia had on the Asian shipping network became even stronger after the directors in the Netherlands decided that all return shipping would be routed through Batavia. Initially, some *retourschepen* were still sailing directly back to Europe from the Coromandel Coast, Surat or Persia. This was eventually forbidden by the VOC in the Netherlands mainly for safety reasons, but this centralising policy was very much welcomed by VOC Batavia in order to reinforce their central role. From 1630 the number of homeward-bounders available in Batavia was sufficient to make it desirable to employ them in between their return voyage to Europe, on the Asian routes where a reliable supply of (bulk) cargo was available. In 1642 the number of homeward-bounders in Batavia was so high that the best suited vessels were sent back to the Netherlands and the remainder were permanently reassigned to the intra-Asian network (Coolhaas 1964, p. 200). The management in Batavia was, in principal, bound to the directions they received from the Netherlands for the return cargo. However, to a certain extent Batavia was able to influence the policy by their implementation of the return shipping. Often they diverged from the directions using unforeseen circumstances as an acceptable excuse (Coolhaas 1960, p. 455; Colenbrander 1923, p. 857).

Obsessively, they tried to meet the prescribed division of cargo for the various Chambers. It was only in exceptional circumstances that management in Batavia had to report that they were not able to meet the required 'egalisatie'. In such cases, it was common to blame the Netherlands organisation for not sending a suitable fleet of *retourschepen* that would enable them to distribute the cargo among the various Chambers in accordance with agreed formula:

> 'Soo lange bij Uwe Ed. aldaer in 't herrewaerts seinden van goede retourschepen geen nader ordere gestelt wert, is't ons onmogelijck de gerecommandeerde egualiteyt in 't overseinden van de retouren aan de respective cameren t'onderhouden' [As long that your Hon. over there no system applies for the sending of good retourschepen, it will be impossible for us to meet the requirements of the recommended division of cargo …] (Coolhaas 1960, p. 281).

An extra complication in this planning was that the homeward-bounders did not have standardised dimensions (NA 1.04.02, VOC 677, 1-9-1656).

The internal organisation of the VOC with its strict division of activities between the various Chambers was often a burden. The authorities in Batavia would have been gravely concerned with meeting the requirements of proportional division of the cargo for the various Chambers in the Netherlands. Further examination is warranted into how the 'egalisatie' driven organisation in the Netherlands fit into the establishment of the VOC in Asia which had a separate mission and was only confronted with the consequences of the egalisatie policy through: the ships that were granted for the Asian fleet; the restrictions in developing their own ship building programme; and of course, the complex organisation of the return cargo.

The ballast that was required for the specific design of the Dutch vessels formed an important logistical aspect of the organisation. In this aspect, the VOC demonstrated a commitment to search for an optimum system. Merchants within the intra-Asian network were permanently looking for suitable goods that could be used as ballast. Their challenge was to find 'paying'

ballast that would contribute to the profit rather then being an expense. The choice of ballast played an important role in the efficient loading of ships, ensuing that the cargo capacity was most advantageously utilised by valuable products. Three criteria: optimum weight; optimum volume and maximum profit drove the intra-Asian network. For the fleet that was sent to Europe, an additional consideration was the proportional division of cargo amongst the various ships sailing representing the separate VOC Chambers. It was of utmost importance that the Asian organisation provided enough cargo and ballast in Batavia for the *retourvloot.* It can be said that the VOC succeeded in synchronising the cargo capacity of the vessels sent with the supply of cargo within certain region. It was rare that ships sailed with an underutilised cargo capacity; on the contrary, ships were sometimes overloaded. The VOC even used less suited vessels like men-of-war to serve on the trading network at the expense of their military capacity (NA 1.01.46, Admiraliteit Amsterdam 1534, 5-1-1605).

Success of the VOC: Attuning the organisation and the various networks

In order to assess the efficiency of the VOC, we have to study the link between the Europe-Asia shipping network, and the intra-Asian network including the main logistical aspects. It is apparent that the intra-Asian network provided the European-Asian network with the return cargo for the European market. Less obvious, but of equal importance, was the contribution from Europe of new vessels, equipment, supplies and new staff for the organisation in Asia. By taking the various aspects of the shipping and trade into account conclusions can be drawn as to whether the VOC was successful in overcoming bottlenecks and taking advantage of opportunities.

The *retourschepen* attached to the European-Asian network were examined. Most vessels arrived in Batavia from Europe between June and October. It would take some time to unload the supplies and other goods from the vessels. The new non-nautical staff that arrived with the fleet needed time to recover from their intercontinental journey. Most soldiers were needed at the Spice Islands. As shipping from Batavia to the Spice Islands was only possible from November, soldiers had time to recover in the hospital in Batavia; only healthy soldiers were sent to the harsh conditions of the Spice Islands. Although the VOC tried to finance the return cargo through intra-Asian trade, currency and bullion were still required and had to be provided by the Netherlands. A small part of this money was used to pay staff, but the majority was required to buy silk and textile in China, Surat and the Bay of Bengal. Late arrival of this money had consequences for the progress of trade; missed opportunities could cause delays of a year (Coolhaas 1947, p. 20; Coolhaas 1960, p. 456).

Retourschepen that were not available to participate in intra-Asian shipping and were intended for a direct return voyage to Europe, could commence reloading, assuming of course the availability of the return cargo in Batavia. The unloading and the loading of the Dutch vessels was complicated by the fact that they required a minimum amount of ballast in order to maintain stability even while vessels were stationary. This was sometimes difficult to achieve and could lead to a loss of available cargo space. If ballast and cargo was incorrectly loaded, stability could be seriously compromised; some ships did have to abort their journeys and return to Batavia. Sometimes, there was no other option and 'paying ballast' from the Netherlands (or visa versa) remained on the ship. For efficient loading of the ships sufficient ballast products needed to be available at the roadstead. The organisation of the VOC needed to anticipate requirements by having both sufficient ballast and cargo available in Batavia.

The departure date of the *retourschepen* was dictated by the VOC in the Netherlands and based on the desire for the fleet to return to Europe before or at the start of the European autumn. This met with nautical and commercial requirements: that is, before the autumn storms and before the northern winter ice would prevent European distribution to the buyers of the VOC products. This timing however, created problems for the VOC in Asia. To arrive at this time, the fleet had to leave Asia around the turn of the year. This meant that loading had to

commence long before December, with the ballast requirements already met. The most lucrative ballast was sugar from Taiwan and copper from Japan but ships from this region had problems reaching Batavia in time as they could generally only sail from the Far East after September. A partial solution for this problem was found in the sending of the early arrival *retourschepen* to Taiwan or even Japan to collect their return 'ballast' themselves. They could keep part of their European cargo specially shipped for Japan on board and could supplement that with products like pepper and sandalwood from stocks in Batavia. Silk from Persia, which was also traded in Japan, arrived in Batavia in August, but this was too late to fit in with this arrangement. These ships would return to Batavia in November-December with the bulk of their European cargo in their hold and only needed to be 'topped up'.

The timing of shipping was not as critical for the important spices from the eastern region. There was a guaranteed supply of these spices and purchasing costs were low, both of which allowed the VOC to keep excess stocks without putting a financial burden on the VOC. Their only concern was to keep these products out of the hands of others and the VOC therefore put a lot of energy and resources into the protection of their monopoly. As a result, the provision of new soldiers to this region was important. As discussed before, the timing of the arrival of the ships from Europe with new soliders left enough time for the soldiers to recover and their transport to the Spice Islands. There was a constant demand for soldiers and food at the Spice Islands and some ships had to sail in November early in the season, when the west monsoon began to blow. The logistical bottleneck, however, was that ships leaving for the eastern region at the turn of the monsoon would be trapped for many months before they could return to be deployed on other routes. Smaller defendable vessels were needed at the Spice Islands to protect the monopoly against other traders coming to the region once the weather permitted. The transport of soldiers and supplies required larger vessels. Regular *retourschepen* could not be employed because they would not be able to return in time for the departure. The solution was to send the cargo carriers that were specially sent to Asia carrying staff and supplies as well as older *retourschepen* that would not return to Europe and were to end their careers in Asia. The use of the newer stronger *retourschepen* in local transport and communication could be justified if the voyage to the Spice Islands was combined with a more extended and demanding trip to the Philippines, Taiwan, Siam and back to Batavia (Coolhaas 1960, p. 470).

Often, other ships sailed to the Spice Islands later in the season , after the arrival of the soldiers and the supply of rice from other regions in Asia. Soldiers were often transferred between posts (Coolhaas 1960, p. 535). The VOC made optimal use of their ships by sending them at the end of the western monsoon in March, so they could return with the change of the monsoon in April. Good cargo carriers, such as flutes, made a speedy return trip to the Spice Islands. Other less fit vessels would delay their return, thus ensuring a constant supply of spices to Batavia from May until October. This supply was largely used for the *retourvloot*. Ideally they would arrive in Batavia after the *retourschepen* had already loaded their heavier cargo and pepper, the vessels could then simply be 'topped up' with this cargo.

Important cargo for the return fleet also came from the western regions. Many of the vessels used in this region came as part of the blockade fleet to Goa and were sent at the end of the monsoon season to other destinations like Surat, Persia and the Bay of Bengal.

To bring silk to Batavia in time for the return fleet, the vessels left Persia between March and June on a direct voyage to Batavia. The complication was that the bullion these ships carried from Persia was not intended for Batavia but for the Indian market. It was, therefore, more efficient to sail via Surat and the Bay of Bengal to Batavia.

Shipping to the Bay of Bengal was possible all year round. If vessels left Batavia early in the year, they could make it back in November, in time to deliver some of their goods as return cargo for Europe. However, for the trade in this region bullion was required, so the departure date of these vessels from Batavia depended on the arrival of money with the European fleet (often in July/August). The bullion that came from Taiwan to these western regions only arrived through the Strait of Malacca from December, too late to use in trade in the region of the Bay of Bengal for products intended to reach Batavia before the end of the year. Consequently, products that were bought with this money could only be shipped to Europe with the return fleet the following year. To use this trade capital as lucratively as possible, a sub-network was

established for the interim period: sugar was purchased in Bengal and shipped to Persia, vessels returned to India and Bengal from Persia with cargo and bullion, the bullion was used to buy textile and indigo. In addition, the opium trade from Bengal to India proved profitable.. Cinnamon and textile for the return cargo to Batavia was almost always available; shipping between Coromandel Coast/Ceylon and Batavia was possible all year round.

The complex shipping around Taiwan

Further away from Batavia, at the northeastern corner of the intra-Asian network, the needs of the *retourvloot* were also felt. There, the VOC had to deal with local circumstances that often required specific vessel types and effective organisation. The VOC proved able to maximise their shipping around the arriving and departing fleet for Europe. Through flexible employment of a differentiated fleet, they were able to attune and synchronise as much as possible the needs of both systems. This same efficiency can be seen in the organisation of shipping at the local level.

The nature of the organisation in Taiwan was determined by local (indirect) trade with China and strict regulated trade with Japan. The Chinese goods assembled in Taiwan had to be sent to Japan in a short time frame due to the strict dates that were set by the Japanese authorities and the monsoon conditions. Subsequently, the goods returning from Japan had to be sent off as soon as possible to Batavia together with the Chinese goods for the *retourvloot* or to the *retourschepen in the Pescadores* that had sailed on from Batavia to the Far East. The *retourschepen* could not be loaded in Taiwan because: the entrance to Fort Zeelandia – a canal – was too shallow and the roadstead too dangerous to dock at. These factors made logistical organisation very complex. The larger ships anchored at the Pescadores, a group of islands off the coast of Taiwan. Small vessels carried the cargo from the fort to the larger ships. These smaller ships with a limited cargo capacity were not as suitable as the large ones for the shipping between Taiwan and Japan. The weather and sea conditions could make it very difficult to sail in and out of the canal. It was a logistical challenge to have sufficient vessels with a limited draught but reasonable cargo capacity and good sailing capabilities available for a short period. The VOC's answer was to use small flutes and local vessels. Outside this busy season, only a few of these small flutes could be used for the shipping with Tonkin (Coolhaas 1964, p. 356; Case Study 7-1) Most of these vessels therefore, left the region for Batavia in March, at the end of the northeastern monsoon, with the last products purchased from China. Most of these flutes would make a stopover at Siam to load timber, sapan and rice for Batavia (Coolhaas 1964, p. 394).

There were strong military demands on the VOC in the Taiwan region, first to remove the last pockets of Spanish power and later, to cope with the aggression of the Chinese pirate Coxinga. For these reasons, soldiers had to be shipped from Batavia. Part of the fleet assigned to sail to Japan and Taiwan had to wait for the arrival of soldiers from the Netherlands, who were shipped directly after their arrival.

The shipping of food supplies was also an issue for Taiwan, but the area was less dependant on Batavia than the Spice Islands. Some food came from China and large quantities of rice and oil were shipped from Siam. A few ships left Batavia early in the shipping season for Taiwan and in April/May for Siam; they sailed almost empty with some Persian silk that had arrived the previous year; food supplies for Taiwan; deerskin for Japan and a ballast of boulders. On the return voyage, some ships made a stop at Siam and used the precious metals from Japan to buy wood and rice. If loading at Siam did not take too long and they made the voyage to Batavia in good time, these ships could sail directly to the Spice Islands with rice at the end of the west monsoon period.

The smaller vessels needed for the busy loading season left for Taiwan in April/May at the start of the southwest monsoon. They could transport any currency that had arrived late from the Netherlands to buy Chinese products. After all the vessels had arrived in the region in September, the loading had to follow a set sequence. First, the *retourschepen* that had sailed to Taiwan to collect some of their return cargo had to unload any cargo intended for the Asian

region and then reload for the return journey. In a very short period, there was a lot of traffic between the Pescadores and Taiwan with vessels carrying pepper and ballast stone from the *retourschepen* to Taiwan. The ballast stones were used for reinforcing the pier and jetties at Taiwan. Chinese and Japanese merchandise – lacquer and porcelain – with a ballast of sugar were then loaded for the return voyage.

Following the *retourschepen,* the vessels for the direct route, that is via Malacca to the Coast of Coromandel and the Arabian Sea, needed to be loaded with the precious metals from Japan, some Chinese goods like porcelain, and sugar for Persia. These ships would need to pass the Strait of Malacca before the end of December for an easy voyage into the Bay of Bengal and to Persia. The ships used from 1638, – when this route opened, until 1644 – when there was a truce with Portugal, were heavily constructed and heavily armed in order to protect the valuable cargo against both the sea and the European enemy. From 1644 until 1652, robust ships were required, but the threat of enemy attack was not a problem until after 1652.

As the only enemy on this route was in the Arabian Sea, there was a strong temptation to send the ships heavily loaded and therefore less suitable for military action. Vessels were sent like this from Taiwan to Malacca or Galle, where the cargo was redistributed and the ships were prepared for military action before continuing the journey to the Arabian Sea. Overall, the most significant complicating factor in the loading system used in Taiwan was, that all the vessels were present in this region of the East China Sea during the typhoon season (Coolhaas 1964, p. 210). As a result, a number of the larger VOC vessels that were anchored in the shelter of the Pescadores were shipwrecked, as were some smaller vessels[72].

Organising the shipping on a local level around India

A similar attuning of the various shipping and trade systems took place in the Indian Ocean, the Bay of Bengal and the Arabian Sea. The benefits of the VOC's differentiated fleet and their ability to adjust to changes in circumstances to maximise trade opportunities is clear in this region. In the Arabian Sea changes were driven by a military confrontation with the Europeans. Particlarly around Goa the VOC felt the need to employ their military against Portugal. However, the blockade of Goa also served a clear commercial purpose; the VOC justified the the high costs associated with the blockade with the profit they expected from higher pepper prices if the Portuguese could not ship to Europe. The main Portuguese city in Asia was, unlike the VOC headquarters in Batavia, subject to the influence of the monsoon. Shipping to and from Goa was only possible between September and May. From 1620, the VOC implemented an active policy to disrupt Portuguese activities in the Arabian Sea through a blockade of Goa. This blockade occurred annually from 1636 until 1644 when the Netherlands reached a truce with Portugal; the blockade resumed again after 1652.

How did this military activity fit in with the VOC organisation? To begin with, there were the blockade vessels waiting in Batavia for both sailors and soldiers arriving from Europe. The blockade fleet left Batavia, well maintained, supplied and manned with soldiers in July-August. They hoped to reach Goa just before the first Portuguese ships could leave for Europe, after being stuck there for half a year during the monsoon season, or to catch the first arriving Portuguese vessels that normally tried to reach Goa from Mozambique around this time. As the wind conditions were unfavourable for sailing to the west coast of India from Batavia, the Dutch vessels had to make a significant detour over the Indian Ocean, sometimes taking 6 to 8 weeks and leading to a late arrival at Goa. The Dutch fleet would leave the region again at the end of the northeast monsoon in April, when the Portuguese started to lay up their ships for the following six months. Some VOC vessels would stay active in order to prevent those smaller vessels of the Portuguese from leaving with supplies and soldiers for destinations like Ceylon.

What was the additional value of the blockade fleet for the trade organisation of the VOC? On their way to the blockade, the vessels were almost fully laden with soldiers and military equipment and carrying some cargo for Surat and Persia with more to follow on the ships sent after September when the voyage from Batavia or from Taiwan was easier to make via the Strait of Malacca. During the period December-January, well armed vessels from the blockade

fleet could be employed to escort less defensible cargo carriers on their voyage to Surat and Persia. If the ships were not needed anymore for the blockade, they could pick up cargo on their way to Batavia, where they would be maintained and prepared for the next blockade season. For lighter cargo such as pepper from the Malabar Coast or cinnamon from Ceylon, they would keep their ballast. If they were sent to the Coromandel to collect the saltpetre that served as an excellent ballast product for the *retourvloot,* they had to unload their original ballast.

The ships that ended up in Persia could make their return voyage direct to Batavia from around May but there were often navigational problems with this route and it could take four to five months before they reached Batavia. It was safer to sail via Galle to make a stopover for horses which were traditionally shipped from this region. From here, an extra trip into the Bay of Bengal was also possible in order to spend the money recieved from trade in Persia. However, the VOC also had to work around the necessity for the Persian silk to be in Batavia in time for transport to the Far East or the *retourvloot*.

In the Far East and in the Arabian Sea, special fleets were stationed and an organisation set up on a seasonal basis. The total blockade fleet would annually leave the region of the Arabian Sea and only a few smaller flutes would stay behind in Taiwan. In other regions, the VOC had to maintain a fleet and a specific organisation on a more permanent basis. This applies for the smaller utility vessels that were needed at certain destinations where they had to maintain communication and assist with the loading and unloading of the arriving ships. For reasons discussed in chapter 2, these vessels are not fully recognised in this study because they were often purchased locally and hardly made any voyages outside the region where they were stationed. It is clear that this fleet of smaller vessels played an important role in the VOC in Asia. This study has shown the VOC focus of employing their own fleet in Asia. The role of Asian vessels appears very limited; further research into the smaller utility vessels might show a broader role, a different picture.

On a larger scale, the VOC required vessels locally. For example, well-armed small yachts would stay for long periods on the Coast of Coromandel. These yachts needed to be armed in order to protect the VOC's interest, initially against the Portuguese and then later in conflicts with local rulers. The draught of these yachts was less than 9 feet so that they could enter the river outlets to be maintained locally. In order to be able to sail against the monsoon winds they needed to be swift and good sailing vessels. Their area of operation was from Galle, where they patrolled part of the year, to far into the Bay of Bengal.

Since textile had to be collected from various harbours along the Coast of Coromandel medium sized yachts and flutes were active in this region. These vessels also collected cargo from Bengal and Aracan. They gathered the cargo that could not be collected by the larger ships that were unsuitable for the sailing along the coast.

Part 2

The shipping and ships in numbers

8

An analysis of the development of VOC shipping in Asia until 1660

The general development of VOC shipping is described in chapters 3 and 4. This chapter presents and interprets the data collated relating to the development of the VOC network in Asia. As explained in chapter 2, the database contains, for the period examined, a total of 11.700 voyages between 520 destinations in 35 Asian areas; these have been extracted from the total of more then 30.000 voyages held in the database. All the records of local voyages and of the waiting time of a vessel are excluded for the analysis of the development of Dutch shipping in Asian waters until 1660.

These exclusions have been made for a number of reasons. In the first place, the sources available for the reconstruction of local shipping are very diverse and not consistent for all destinations. It is, therefore, possible that the shipping in some areas is relatively over-represented. In addition due to concurrent research for the Avondster Project, (Parthesius, 2003) shipping in Galle was studied in greater detail than other areas. For general shipping, (between areas) this focus has no effect because with a few exceptions, all of the voyages are also found in the general references. Shipping within a particular area is not seen to have contributed to the development of the intra-Asian shipping. Analysis of local shipping provides an insight into the use of specific types of vessels by the VOC and this is covered in chapter 9.

From analysing the data, the total growth of VOC shipping in Asia can be calculated/established. These figures relate to shipping within Asia, and therefore do not include the arrival of ships from Europe, which were part of European-Asian shipping. Apart from a few exceptions over the years, the first stop was west Java, with Batavia as the central rendezvous from 1619. A ship's journey is included only if its first port of call was in Asia and it then sailed to another destination within Asia..

This chapter presents and explains the quantitative data from the database relating to the development of the VOC network in Asia. The applied methods are described in chapter 2 on the database.

Period	Frequency	%Growth	Volume	%Growth
<1610	606	-	124884	-
1610 <1620	1055	75	200945	61
1620 <1630	1920	82	296893	48
1630 <1640	2365	23	345935	17
1640 <1650	2804	19	509337	47
1650 <1660	2757	-2	470536	- 8

Table 8.1: Development of the intra-Asian shipping in frequency (arrivals on a destination in Asia) and volume (tonnage in lasten)

From the data in Table 8-1 it can be seen that up to 1630, the frequency shows a steep growth, consistent with the initial developmental phase (see chapter 3.3). From 1630 until 1650, there is

a more steady growth: the existing network is further developed and intensified (described in chapter 3.4). In the period 1650-1660, the intensity of the total of intra-Asian shipping decreases slightly. If the volume of the shipping is considered, the same development can be seen though with some slight deviations. The total volume of the shipping grows until 1630 but less than the frequency. After 1630, the growth stagnated somewhat, but there was a steep growth again in volume between 1640 and 1650, although there was only a smaller increase in the number of intra-Asian voyages. The volume of shipping stabilises again between 1650 and 1660. These developments will be explained in relation to the composition of the VOC fleet in Asia (see Part 1 chapter 5 and Part 2 chapter 9).

From this database it is possible, for the first time, to analyse the development of the VOC shipping in Asia quantitatively. This analysis has been carried out in ten-year periods[73] from 1595 to 1660 on the frequency of arrivals and ships' tonnages in 34 trading areas grouped in 7 main regions.

From the data in both Table 3-1 and Table 3-2 (see section 3.5), the development of the total shipping network can be seen. In the period under consideration, 33% of all the arrivals (and 29% of the total cargo space involved) of VOC intra-Asian voyages were in the region around the Java Sea, with Bantam (in the early years only) and Batavia being the most important harbours. The prominent position of this region is clear for both the inter-Asian and intra-Asian networks. A constant growth can be seen in the arriving shipping volumes in this area over the whole of this period, indicating a constant growth in the available Asian goods in Batavia for transhipment to Europe.

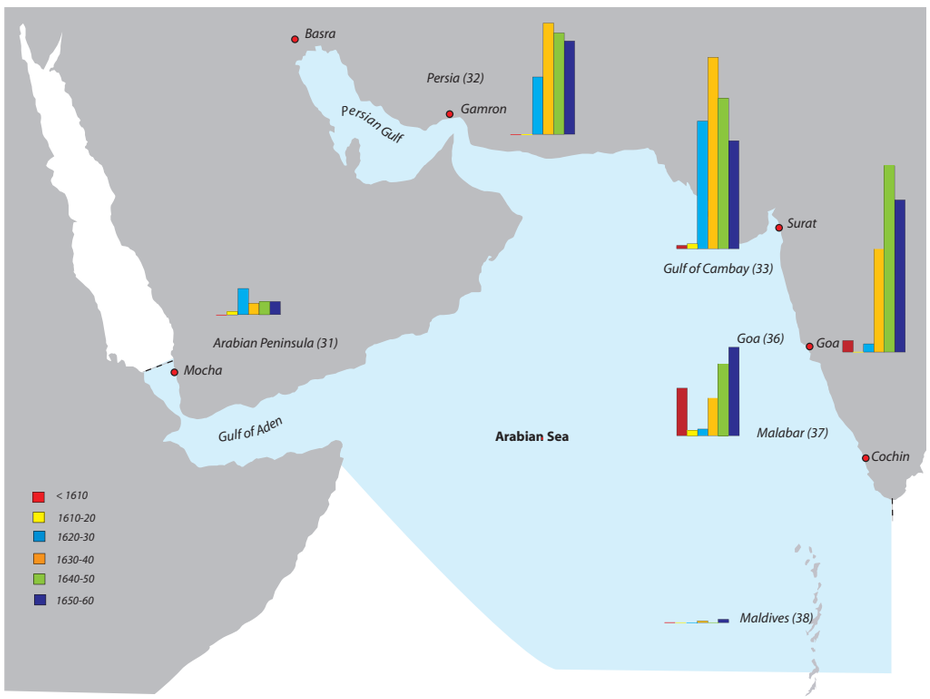
Over the whole period, the Spice Islands were also an important destination as one of the core businesses of the VOC. Ambon (Area 85), Banda (Area 86) and the Moluccas (Area 88) together represent almost 16% of all arrivals and the total shipping volume. The region does show some fluctuations in the numbers of visiting ships and their cargo space because of the effects of large military actions in some periods, but otherwise maintains a consistent high level between 1610 and 1660.

For other regions, like the important pepper ports on Sumatra (Areas 51, 52 and 53), the increase in shipping is clearly visible during the VOC's development phase. Shipping to other destinations like the Arabian Sea and the Far East emerged later in the process, but was in some decline already in the last 10-year period under consideration. The growing importance of the Bay of Bengal (VOC's *vette weide* – the plentiful meadows) is clearly shown in numbers of visits and volume amounting to nearly 20% of total VOC-shipping in Asian during the last 10-year period.

Besides developments instigated by trade, other aspects such as a military emphasis on a given region are also reflected in Table 3-1 and Table 3-2. Changes in the arrivals and volumes of shipping to the Strait of Malacca (Area 61) are indicators of changes in the nature of the shipping. When the VOC intensified its attempts to ban Portuguese shipping through this important connection between the Far East and the Indian Ocean around 1630, they sent smaller, well-armed yachts to this region. Table 3-1 shows the frequency of arrivals in the region growing rapidly, but there is a decline in the average tonnage to 150 of the ships in the 1620s and the 1630s and even in the absolute shipping volume arriving in the area (as can be seen from Table 8-3). After 1640, when the situation had stabilised, the average tonnage again increased to values around 300 in the period between 1640 and 1659. Although some general trends can be clearly seen, a more detailed analysis will reveal much more of the manner in which the VOC shipping in Asia developed during the first half of the 17th century. These detailed analyses will be given below.

The seven main regions are for this purpose divided into 35 areas, mostly following the 17th century VOC concept for these geographical units. For this reason, some differences do exist between the modern state and region names used to identify the areas in the tables. The exact definitions of the areas can be seen from the description in section 2.5.1. The matrix that is formed by the number of arrivals and the associated volume per 10-year period is depicted in the follow section where the main developments that can be derived from these figures are described.

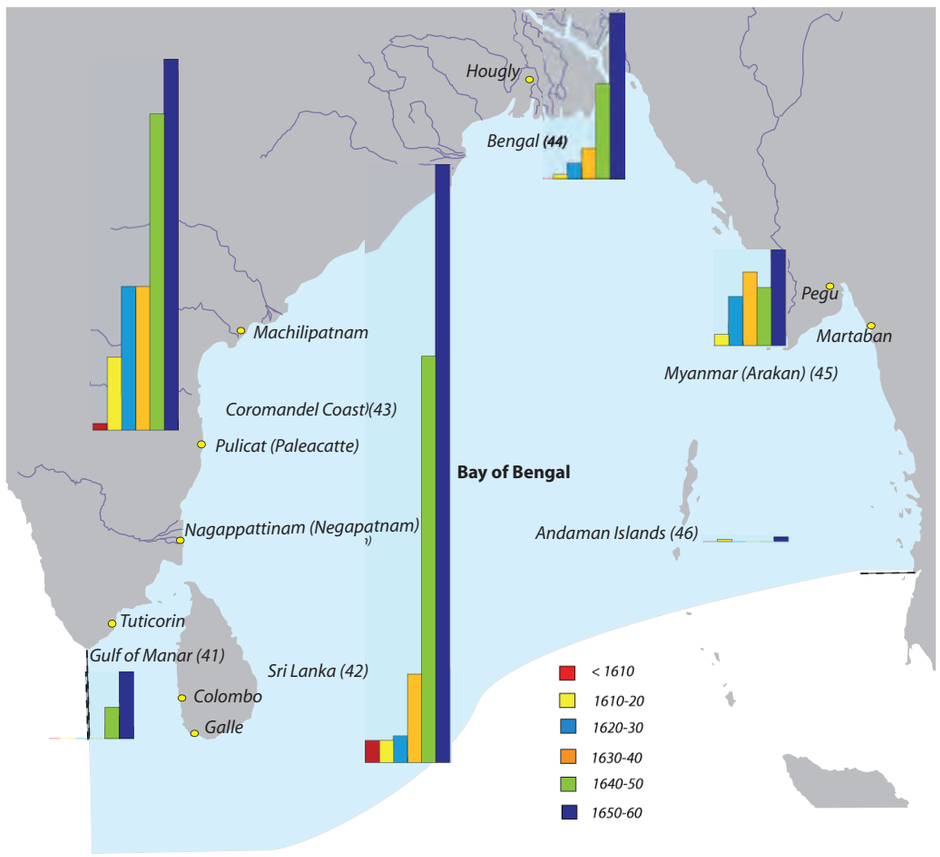
Arabian Sea



Shipping to the areas to 1660 Frequency	Period													
Area	**<1610**		**1610-20**		**1620-30**		**1630-40**		**1640-50**		**1650-60**		**Total**	
	freq	***vol***	***freq***	***vol***	***freq***	***vol***	***freq***	***vol***	***freq***	***vol***	***freq***	***vol***	***freq***	***vol***
31. Arabian Peninsula			2	200	16	4130	7	2185	8	1600	8	1325	41	9440
32. Persia					35	8286	68	18700	62	14718	57	11015	222	52719
33 Gulf of Cambay	2	450	3	675	78	18948	107	27310	92	23056	66	12420	348	82859
36. Goa Area	7	1950			5	1755	63	12185	114	22797	93	18305	282	56992
37. Malabaar	29	8250	3	330	4	1110	23	3950	44	8553	54	10260	157	32453
38. Maldives					1	400					2	575	3	975

Table 8.2: Number of arrivals and associated volume per 10-year period for the Arabian Sea.

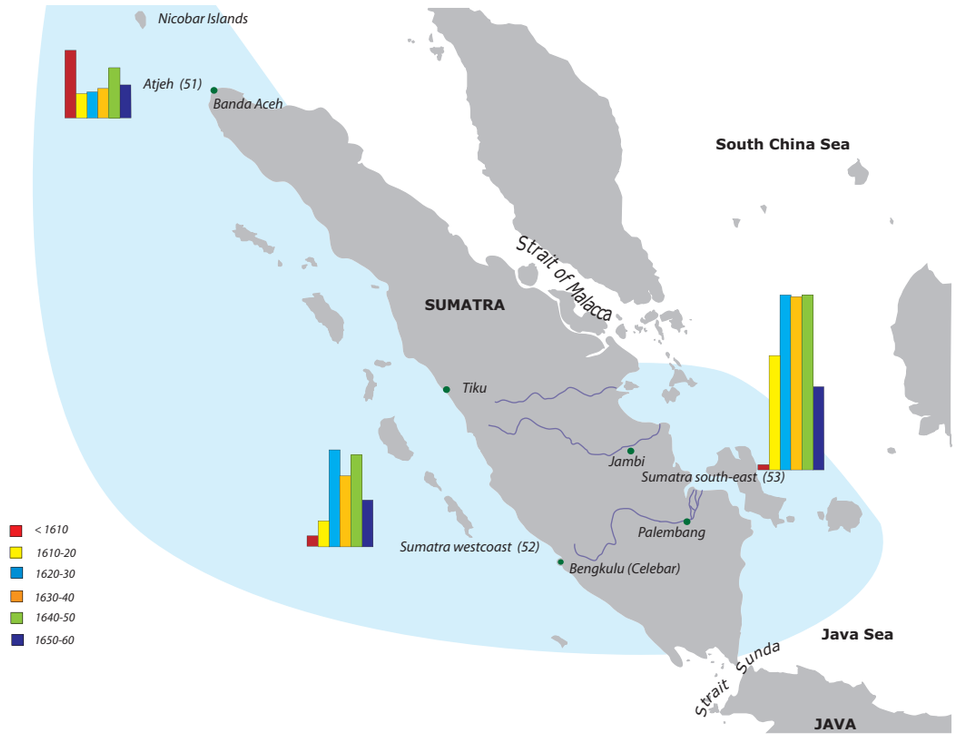
Bay of Bengal



Shipping to the areas to 1660 Frequency	Period													
Area	**<1610**		**1610-20**		**1620-30**		**1630-40**		**1640-50**		**1650-60**		**Total**	
	freq	***vol***	***freq***	***vol***	***freq***	***vol***	***freq***	***vol***	***freq***	***vol***	***freq***	***vol***	***freq***	***vol***
41. Gulf of Manar									14	1175	30	2710	44	3885
42. Sri Lanka	10	1715	10	995	12	2150	40	6131	184	32411	276	43862	532	87264
43. Coromandel coast	6	910	33	4450	65	10351	65	8812	143	25461	168	25976	480	75960
44. Bengal			2	410	7	400	14	1158	43	6876	75	12810	141	21654
45. Myamar			5	295	22	1960	33	3441	26	4345	46	6131	132	16172
46. Andaman Islands			1	30							2	100	3	130

Table 8.3: Number of arrivals and associated volume per 10-year period for the Bay of Bengal.

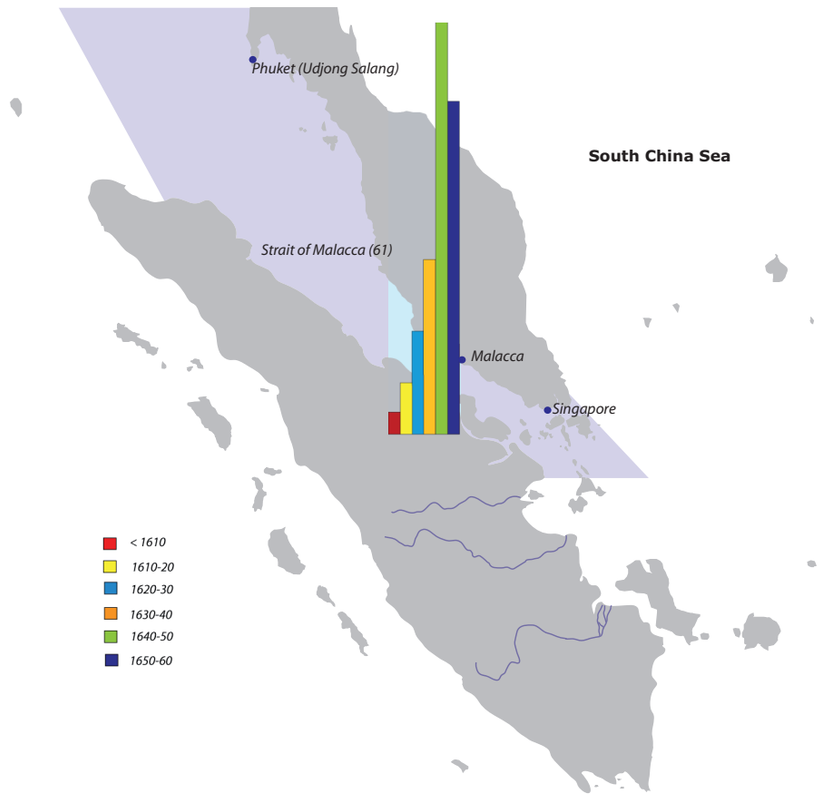
Sumatra



Shipping to the areas to 1660 Frequency	Period													
Area	**<1610**		**1610-20**		**1620-30**		**1630-40**		**1640-50**		**1650-60**		**Total**	
	freq	***vol***	***freq***	***vol***	***freq***	***vol***	***freq***	***vol***	***freq***	***vol***	***freq***	***vol***	***freq***	***vol***
51. Atjeh, Nicobar islands	39	7845	14	2245	15	2595	17	1603	29	3458	17	1595	131	19341
52, Sumatra westcoast	6	860	15	2805	56	9121	41	7359	53	10922	27	4225	198	35292
53. Sumatra southeast	3	280	66	7645	101	13250	100	12675	103	16187	48	8457	421	58494

Table 8.4: Number of arrivals and associated volume per 10-year period for Sumatra.

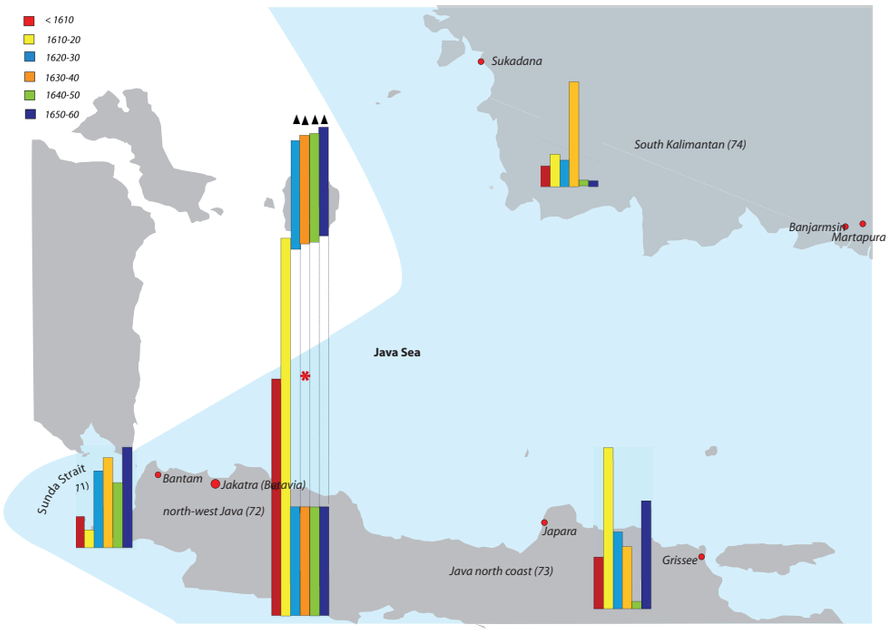
Strait of Malacca



Shipping to the areas to 1660 Frequency	Period													
Area	**<1610**		**1610-20**		**1620-30**		**1630-40**		**1640-50**		**1650-60**		**Total**	
	freq	***vol***	***freq***	***vol***	***freq***	***vol***	***freq***	***vol***	***freq***	***vol***	***freq***	***vol***	***freq***	***vol***
61. Strait of Malacca	46	12405	28	5440	56	4276	95	7510	224	34405	181	28456	630	92492

Table 8.5: Number of arrivals and associated volume per 10-year period for Strait Malacca

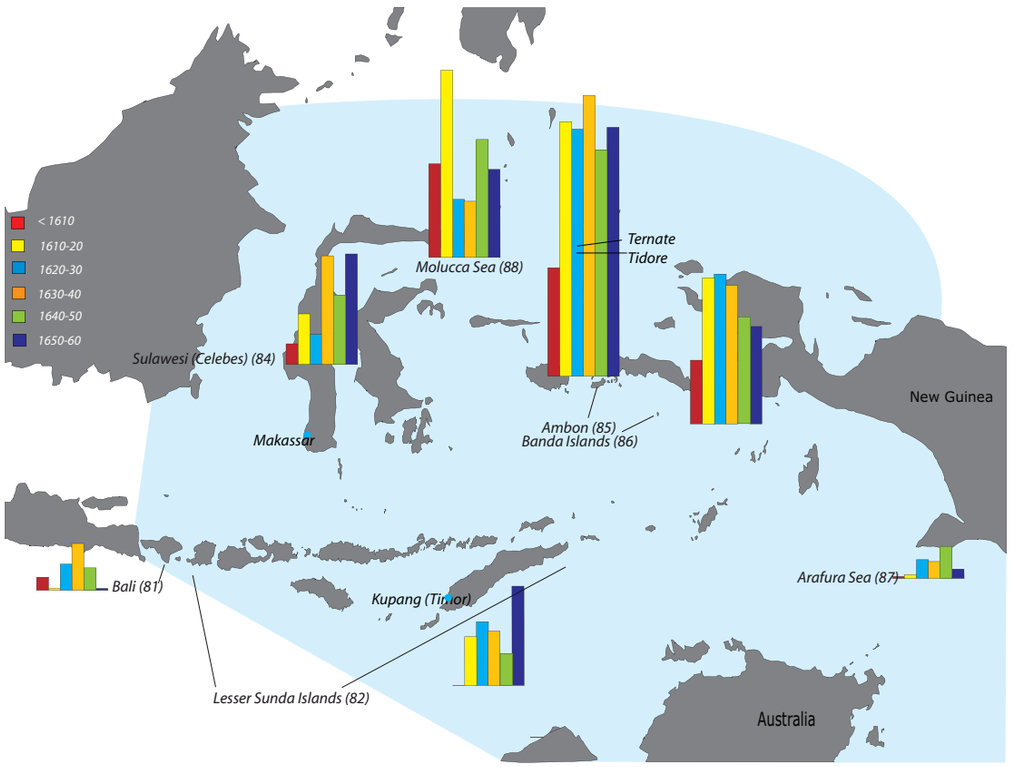
Java



Shipping to the areas to 1660 Frequency	Period													
Area	**<1610**		**1610-20**		**1620-30**		**1630-40**		**1640-50**		**1650-60**		**Total**	
	freq	***vol***	***freq***	***vol***	***freq***	***vol***	***freq***	***vol***	***freq***	***vol***	***freq***	***vol***	***freq***	***vol***
71. Sunda Strait, south coast Java	21	3890	12	2105	55	7575	61	10069	44	9106	68	13470	261	46215
72. north coast Java, (surroundings Batavia, west of 108° E.L.)	161	34020	257	44227	607	89190	706	102271	736	140082	742	136575	3209	546365
73. north coast Java, east of 108° E.L., Madura	35	5230	109	23546	56	6626	42	4325	5	450	77	15347	324	55524
74. south Kalimantan	14	1505	22	705	18	1261	71	5506	4	296	4	455	133	9728

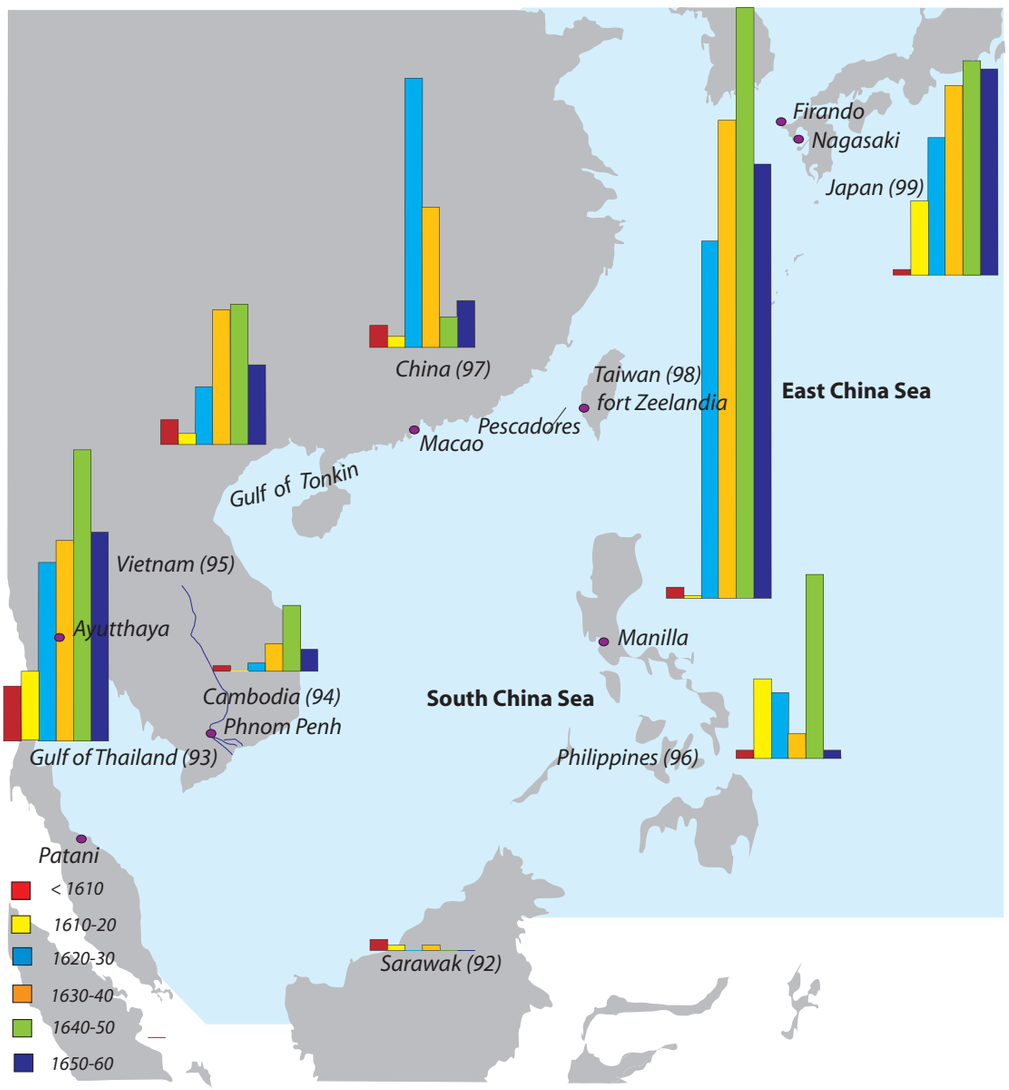
Table 8.6: Number of arrivals and associated volume per 10-year period for Java

Spice Islands



Shipping to the areas to 1660 Frequency	Period													
Area	**<1610**		**1610-20**		**1620-30**		**1630-40**		**1640-50**		**1650-60**		**Total**	
	freq	***vol***	***freq***	***vol***	***freq***	***vol***	***freq***	***vol***	***freq***	***vol***	***freq***	***vol***	***freq***	***vol***
81. Bali, east Java	7	1105	2	490	14	2405	25	1358	12	2030	1	170	61	7558
82. Lesser Sunda Islands			26	2895	34	2295	29	2550	17	2085	53	5060	159	14885
84. Sulawesi	11	2225	27	5885	16	1430	58	5543	37	5636	59	8875	208	29594
85. Ambon, Buru, western Ceram and adjacent islands	58	11896	136	31376	132	23698	150	16138	121	20707	133	21904	730	125719
86. Banda Archipel and eastern Ceram	34	6288	78	18010	80	14445	74	9731	57	7349	52	10094	375	65917
87. Arafura Sea	1	30	2	500	10	840	9	325	17	684	5	219	44	2598
88. Molucca Sea	50	10420	100	26256	31	6810	30	4823	63	13669	47	6925	321	68903

Table 8.7: Number of arrivals and associated volume per 10-year period for the Spice Islands



Shipping to the areas to 1660 Frequency	Period													
Area	**<1610**		**1610-20**		**1620-30**		**1630-40**		**1640-50**		**1650-60**		**Total**	
	freq	***vol***	***freq***	***vol***	***freq***	***vol***	***freq***	***vol***	***freq***	***vol***	***freq***	***vol***	***freq***	***vol***
92. Sarawak	4	605	2	20			2	100					8	725
93. Gulf of Thailand	30	6335	35	5740	65	9636	73	14194	106	27328	76	18230	385	81463
94. Cambodia and lower Mekong delta	2	315			6	255	10	1865	24	3930	8	900	50	7265
95. Vietnam, north from Mekong Delta	9	1960	4	610	21	3090	49	4843	51	6003	29	3090	163	19596
96. Sulu Sea	7	1170	29	7100	24	5735	9	1723	67	11690	3	280	139	27698
97. Coastal China	8	2100	4	850	98	13520	51	5470	11	815	17	1925	189	24680
98. Taiwan and adjacent islands	4	785	1	25	130	17575	174	28226	215	36433	158	25140	682	108184
99. Japan and Korea	2	340	27	5085	50	11775	69	13856	78	15080	75	13655	301	59791

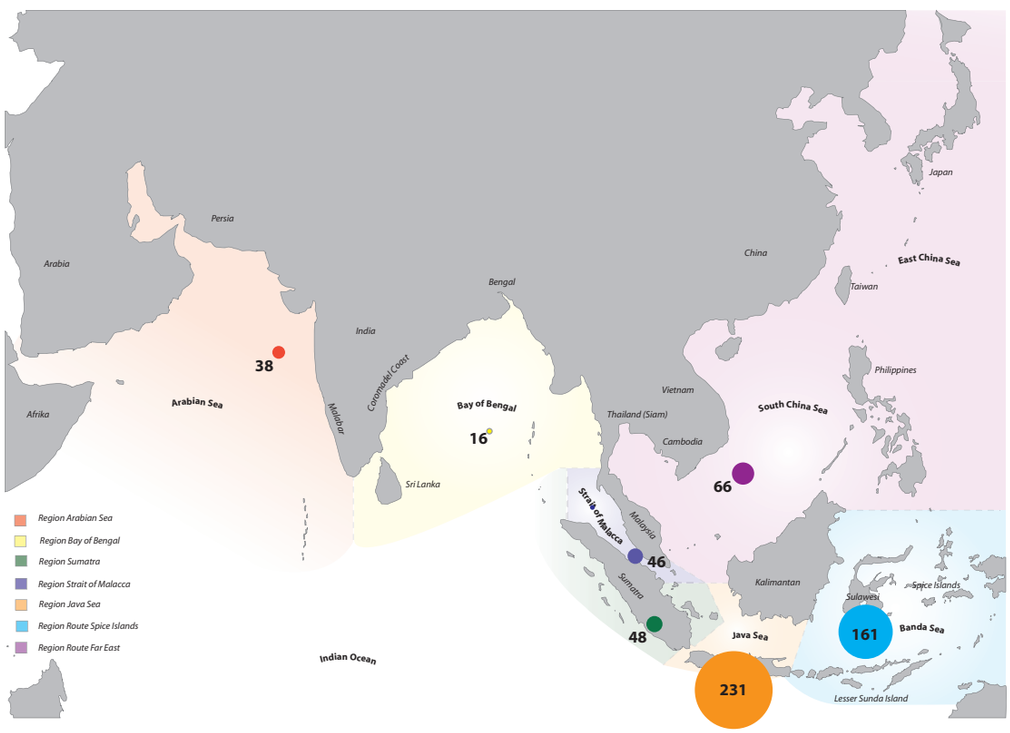
Table 8.8: Number of arrivals and associated volume per 10-year period for the Far East.

The above maps and tables show the enormous fluctuation that sometimes occurred during the development stage of the VOC shipping network. Some percentages of growth might seem to be out of proportion, such as in region 53, the pepper-harbours of southeast Sumatra. However, these figures indicate how extensively shipping was organised after an initial moderate start that frequently had the character of exploration. Changes in the trade or military policy in a given period might also create these enormous fluctuations. Thus China became a destination for the VOC men-of-war in the 1620s after they captured the Spice Islands; in that period shipping to China grew by more than 2.000%, while shipping to the Spice Islands dropped. The combination of increasing percentage frequency and the volume of the shipping are interesting indications of the nature of the shipping and the composition of the fleets – subjects that are discussed in detail in chapter 9.

Development to 1660 in ten-year intervals

In the following section the outcome of the above analysis will be discussed in more detail, as will the most important features of the development of the VOC network in Asia by 10-year intervals. The expansion of the Dutch presence in the various regions is represented in development maps for each period.

The period to 1610



Map 8.1: Development of the frequency of the intra-Asian VOC shipping to 1610

This period covers the development of the *Voor-Compagnieën* and the first years of the VOC. In the period up to 1610, 606 arrivals at various destinations have been recorded in the database. Table 8-6 clearly shows that, right from the outset, west Java (Area 72) was the most frequent destination for Dutch ships with a total of 161 arrivals. For this period, the destination harbour within the area is almost exclusively Bantam. The table does not contain the arrivals from

Europe, but already the importance of this area for voyages between Asian destinations is evident.

The most important objective of Dutch shipping during this period was to purchase pepper and spices. The destinations of the first voyages around Africa were the harbours of west Java that were, more or less, outside the Portuguese sphere of influence. The Dutch had hoped for an easy access to pepper and spices at this location that would make a quick and direct return to Europe possible. Problems with the purchasing of the Asian products soon led to expansion to alternative destinations in the region to collect cargo, after which the ships returned to Bantam to start their return voyage from there.

From the earliest years of Asian trading, the city of Patani (at the eastern coast of the Malay Peninsula, in Area 93, the Gulf of Thailand) was a frequent destination to purchase pepper (30 visits). The pepper market of Sumatra was also potentially important, and various missions were sent to Banda Aceh (Atjeh), Area 51, to establish a relationship with the local ruler. During this period, 39 arrivals of VOC ships from other places in Asia were recorded to Atjeh. In 1599, the ship *Leeuw* (ID:15) stopped at Poeloe Weh – a visit that now provides an early example of Dutch ship building in Asia. With materials that they had brought with them, they built a small yacht to operate in the local trade (Unger 1948: 73). The pepper harbours on the Sumatran west coast, south of Atjeh (Area 52), were not frequented by the Dutch as this point in time (6 arrivals in Area 52). Only in 1600 did the ships *Verenigde Landen* (ID:31) and *Hof van Holland* (ID:25) sail to this area specifically to search for pepper and a few other ships put in to these locations for refreshments. It is interesting to note that the first trade mission from Asia to the Netherlands took place from Atjeh when, in 1602, a trade mission from the ruler of Banda Aceh was sent to the Netherlands, facilitated by the VOC (NA VOC 225: fol. 13). However, relations with the local rulers could not be sustained in the longer term.

The 46 arrivals in the Straits of Malacca were the result of the conflict with the Portuguese. The purpose of these visits was primarily military action against the Portuguese, rather than trade.

Although the Dutch had initially hoped to find all the products they sought in Bantam, spices were also purchased in the areas where they were produced. From west Java, ships sailed directly to the Spice Islands in the eastern parts of the archipelago. For the islands Ternate, Tidore (Area 88, 50 arrivals), Ambon (Area 85, 58 arrivals) and Banda (Area 86, 34 arrivals)[74], a total of 142 arrivals of Dutch ships have been recorded for this period, which makes this region the second most important destination for the VOC.

During this period, there was a consistent drive to develop trade with China. Every few years, ships were sent to China but were not successful in gaining entry into the Chinese market (Stapel 1932: 671 & NA 1.04.02 VOC 99: fol. 176, 244). A total of 8 ships sailed to the coast of China on different occasions but could not get permission to trade. In 1608, Admiral Matelief, who sailed to China with three ships, declared that it was impossible to trade in China since the Portuguese were obstructing him and his ships were too weak to resist them (Jonghe 1865: p. 238). In addition, alternative explorations to Cambodia (2 arrivals) and Vietnam (9 arrivals) to purchase Chinese products were not very promising because of the influence of the Portuguese and the local political instability. However, since the VOC were not officially allowed to trade with the Chinese merchants, no regular shipping could be developed to this destination. For that reason, Patani, also an important port of call for Chinese ships, had to serve as a substitute location for the purchase of Chinese products together with the pepper from the Malay Peninsula. An alternative (and, in one way, very successful) source of Chinese merchandise was the capture of Portuguese ships. In 1602 and 1603, three large Portuguese ships were captured. The auction of the cargo of two of these ships resulted in huge profits in the Netherlands (Pijl-Ketel 1982, Jörg 1983 & 1992).

Initially, the Dutch followed the route to Asia that had first been developed by the Portuguese. This route prescribed that, after rounding the Cape of Good Hope, ships followed a northerly course along the east coast of Africa and crossed the Indian Ocean in the direction of India. The Portuguese had various strongholds along the way that became a target for the Dutch fleets when the VOC adopted a more offensive stance after 1602. Subsequently, more ships visited the Portuguese areas. Table 8-2 shows visits to the Portuguese strongholds on the

west coast of India (Goa, Area 36), the Malabar Coast (Area 37.) It was part of the VOC's military strategy at that time to confront the Portuguese in their own strongholds (Westera 1994: 45). Following 1611, when both this strategy and the sea route to Asia had changed, a steep decline in visits to these places can be seen. It was only in the 1630s, when the VOC started the yearly blockade of Goa and an operation to drive the Portuguese from Ceylon, that a sharp increase in the VOC presence in this region could again be seen.

In this early period, Mauritius played a strategic role for the VOC. It served as an important rendezvous for homebound fleets, it produced ebony and it also reinforced the claim that the VOC monopoly included this part of the Indian Ocean. In this period, the Island was visited 24 times. Apart from the raids on the Portuguese strongholds in Mozambique in 1607 and 1608, most visits in this region were focused on finding a staging post for Asian-bound fleets. Most landfalls on the African coast, Madagascar and the Comores turned out to be unsuccessful. Once the offensive policy was abandoned and after the sea route to Asia was redirected to the southern Indian Ocean, Mauritius continued to be visited after 1610 to take on refreshments and also cargoes of ebony-wood. Some unintended visits to Madagascar were made following shipwreck. These voyages are not included in the analysis of the development of the intra-Asia shipping network of the VOC. They are considered to belong to the outward or homeward bound voyages, as are the incidental landfalls on the western shores of Australia (in later periods) and on some of the Great Ocean Islands.

As a derivation of the early sea road to Asia over the northern part of the Indian Ocean, a couple of places were visited for trade on the coast of India. Textiles were purchased around Surat (the Area 33, the Gulf of Cambay in north-west India – 2 arrivals) and on the Coromandel Coast (the east-coast of India, Area 43 – 6 arrivals). From here the ships sailed to the Straits of Malacca (Area 61) for military operations where their presence could also be combined with the purchasing of pepper.

Extensive military actions were also undertaken in the Spice Islands in order to reinforce the Dutch position in this important market. At the end of this period the VOC had stabilised its position in the southeastern part of the Spice Islands – Ambon/Ceram, (Area 85) and Banda (Area 86) – though with some more problems with local inhabitants. They could now concentrate on fighting the Spaniards in the northern part (Area 88 – the islands in the Molucca Sea, dominated by Ternate and Tidore) and the Philippines (Area 96) in order to consolidate their monopoly in cloves.

The period 1610-1619

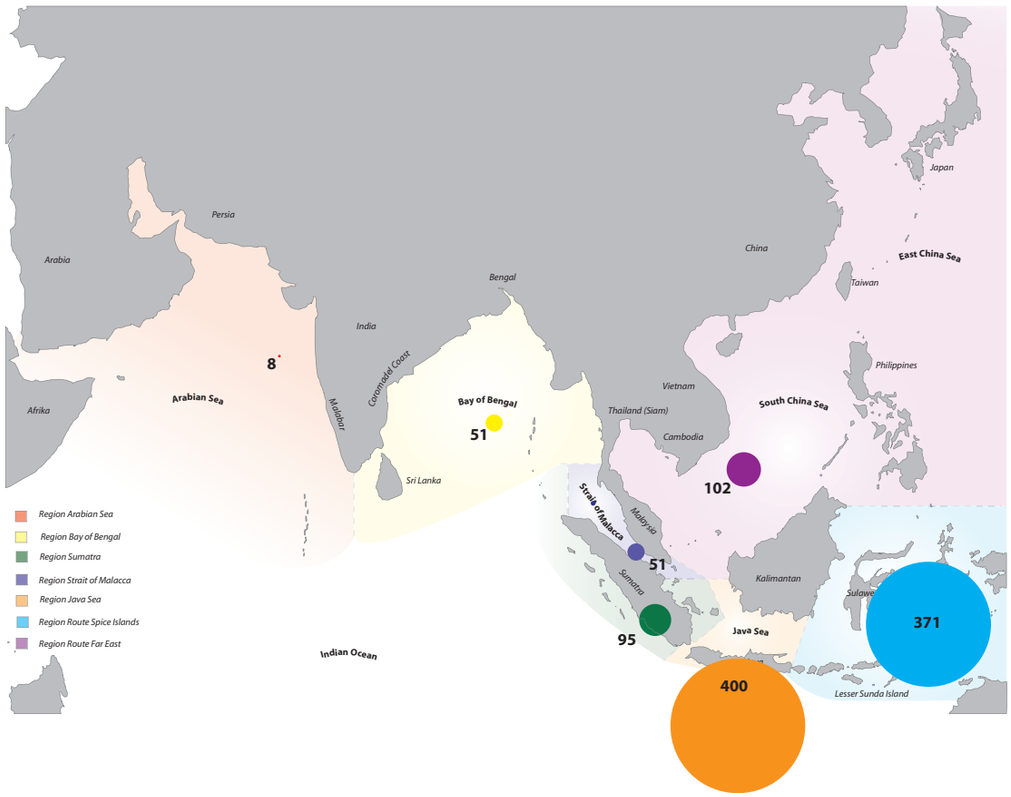
As shown in Table 8-1, the total amount of shipping in Asia grew in this period by 75% in ship movements and 61% in volume over the previous period. A number of noteworthy developments were taking place. Between 1610 and 1619 one can see a significant increase in visits to destinations on Sumatra, as reflected in Table 8-5. This relates to all the important pepper harbours that were rarely if ever visited in the earlier period. For example, the southeast coast of Sumatra (region 53), where Jambi and Palembang were the important harbours, shows 66 arrivals, while in the pervious period only 3 visits were made. This shipping route came into existence from 1615, when director Coen tried to find a solution to the unreliability of Bantam's rulers in applying the pepper and price policy. For that reason, he sent a consignment of textiles to Jambi on a Siamese junk with a Dutch merchant and 'with a minimum of commotion and with silent drums' (Colenbrander 1922, 22-10-1615). Without delay the Dutch started to build a trading post although they still had to deal with some logistical problems related to the shipping: to reach Jambi they needed a special ship that could sail up river (see chapter 5).

The smaller harbours under the influence of Banda Aceh on the west coast of Sumatra (region 52) were visited 15 times. The 6 arrivals in the previous period were mostly incidental landfalls or a search for refreshments along the coast. After 1615, West Sumatra became a regular destination for the pepper trade. This was in line with the policy of the VOC to avoid Bantam and to collect pepper directly from the production areas since the prices in Bantam

were considered too high. This shipping also had a negative effect on the trade with Atjeh, where arrivals fall by 75% to 14 visits in this period.

In the eastern part of the archipelago, the actions against the Spaniards in the Philippines (Area 96 – Sulu Sea) were not very successful; attempts to intercept the Spanish silver ships from Mexico failed time after time. However, the expeditions were still lucrative because of the VOC's capturing of Chinese *jonks* on their way to the Philippines (29 visits). The shipping to this area was principally military in nature. In part 1 it has been described how the sale of the cargo of the captured junks became a kind of trade route in itself.

Shipping from Java to Japan by the northeastern route over the South China Sea was initiated at the end of the previous period and intensified during this period. Thailand, then known as Siam (Area 93), was an important area on this route for the collection of deer and ray skins for trade with Japan so as to acquire products from China and the tropical forest for shipment to Europe. 35 arrivals are shown for this period. Some ships made landfalls on the coast of China but mostly on an incidental basis. In this period 27 visits were made to Japan. On the route between Japan and Siam and vice versa captured or bought large junks were used, but this practice, over which he had no control, was not approved by the commercial director Coen in Batavia.



Map 8.2: Developments of the frequency of the VOC shipping 1610<1620

In the western part of the Indian Ocean, on the west coast of India (Areas 36 and 37), the strong emphasis on fighting the Portuguese in their strongholds declined. The regions around Goa and the Malabar Coast were visited only three times, as against 36 visits in the period to 1610. Military expeditions to Malacca ceased which resulted in a decline of visits to the Strait of Malacca by nearly 50% to 28 visits. This decline is not extraordinary since it was, after all, the period of truce with the Iberians. Although the truce was not strictly adhered to in Asia, it obviously had some effect on the military operations in this region. In any case, the VOC be-

came more involved in developing its own headquarters on Java and was busier than ever reinforcing its position against the English.

Frustrated by the half-hearted attitude of the directors in the Netherlands who were reluctant to make the English their enemy in Asia, the newly appointed Governor-General Coen succeeded at the end of this period in removing the English from the region of the Spice Islands. Initially, the VOC lost its strong position in west Java to the English in 1618-1619. After regrouping on the Spice Islands, a Dutch fleet returned and established Batavia as the VOC stronghold independent from Bantam. By the same token the region of the Spice Islands was then for the most part free from Portuguese and English influence.

The route from the Cape of Good Hope to Java mentioned earlier, following the southern Indian Ocean (the so-called *Brouwersroute*), also resulted in the first involuntarily encounters with the unknown coast of Western Australia; since these encounters do not fall within the ambit of intra-Asian shipping, these early landfalls are not shown in the tables above. Changing the route from the Cape to Java after 1615, also meant a change in the route to Surat and Coromandel. From then on, most of the visits to these destinations were undertaken as an intra-Asian trip from Java rather then a stopover on the route from Europe. Ships were sent directly from Europe to this region on only a few occasions. The coast of Coromandel developed into a substantial provider of textiles for the VOC; the number of visits to this destination grew to 31. On the other (western) side of India, Portuguese influence still was too strong; the visits to Surat stayed at a marginal level with only three visits in this period. There was, however, an attempt to develop trade in the far western parts of the Indian Ocean to Persia and Mocha. In 1616, when the VOC sent merchant Pieter van den Broecke to investigate the possibilities of trade, his assessment was that there were promising opportunities for trade in Indonesian products (NA 1.04.02, VOC 147, 08-1617 point 9). Up to 1620, two VOC ships visited this region on intra-Asian voyages as an overture to the flourishing trade ahead. Three other ships sailed to this area directly from Europe during this period.

In the Lesser Sunda Islands (Area 82), Solor and Timor were also new destinations (26 visits) with the sandalwood from these islands being an important product for the intra-Asian trade. The Dutch could never completely dispel the Portuguese influence in this region; the VOC did not give it the highest priority and the influence of the local Catholic Church was a significant force in favour of the Portuguese. Shipping in the eastern parts of the archipelago on the Spice Islands shows a steady growth: the number of ships visiting Ambon and Ceram, Banda and the Molucca's all more then doubled in comparison with the previous period.

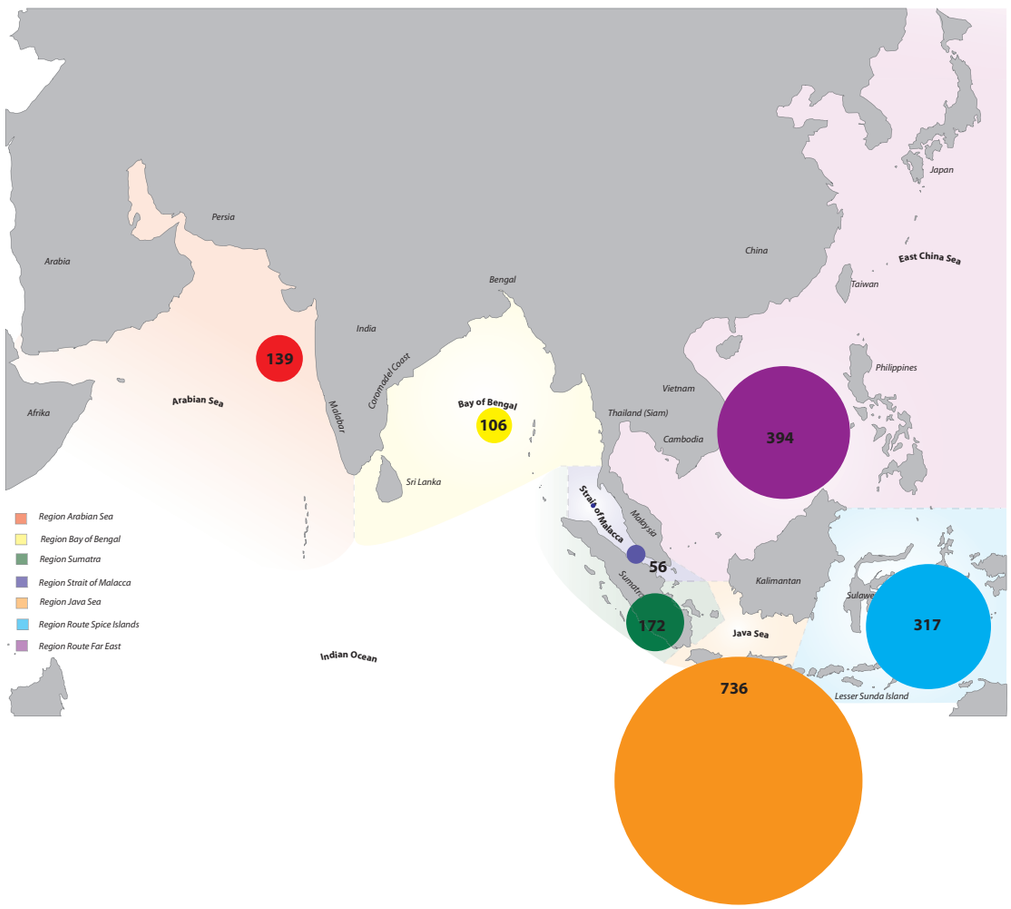
The Period 1620-1629

The total amount of VOC shipping in Asia grew again in this period by 80% of ship movements and 50% of volume over the previous period, as shown in Table 1.1. Again, the significant fluctuation that sometimes occurred during the development stage of the VOC shipping network is evident. With the establishment of Batavia as their central headquarters, the position of the VOC in west Java was now reinforced. A notable development was the increase in the number of visits to east Java – Bali (Area 81) and the visits to Macassar (main destination on the island of Sulawesi, Area 84), which had already commenced in the pervious period. This development was linked to the changing position of the VOC on the Spice Islands. The Dutch had succeeded in establishing a monopoly on trade in that area but this brought with it the obligation to take over the supply of food and other products since local shipping and trade were banned. The above-mentioned harbours, therefore, became an important stopover to load supplies for the region controlled by the VOC.

From Batavia, some direct shipping routes in the region around Java were developing, notably to Timor to collect sandalwood, which started in the previous period, and to Borneo, to collect products from the tropical forest, pepper and diamonds. Products (especially sandalwood) collected in the archipelago were partly used as barter for trade with the Asian mainland where they were exchanged for goods for the European market, as well as for products for intra-Asian trade, like textiles in Coromandel and deer skins in Thailand. Trade to the region of

the Bay of Bengal was further expanding eastwards to Bengal (Area 44) and Aracan (modern Myamar, Area 45). After a few exploration voyages in the previous period, the number of visits to these two areas grew to nearly 30. The most important destination in this region remained the Coromandel Coast with again a large increase (of around 100%) to 65 visits.

After the VOC had settled a peace agreement with the English at the beginning of this period, hostilities with the Iberians again intensified. It seems that the direction for military action was linked to available military capacity, with action moving back from the region of the Spice Islands, where the VOC fought the English, to the Portuguese strongholds in the Strait of Malacca again. By pursuing the Portuguese and their allies in this region, the VOC hoped to control this very strategic connection between the Far East and the Indian Ocean region. Since the Sunda Strait was already controlled by the VOC, they could then exert complete control over the shipping routes between east and west Asia. The frequency of the VOC shipping in this area was double that of the previous 10 years and even higher again than in the first period. The volume of these ships, however, was even lower than in the previous period, indicating the change in ship type already mentioned in Part 1.



Map 8.3: Development of the frequency of the VOC shipping 1620<1630

The increase in the number of visits to China (Area 97) was spectacular. In the previous period there were only four visits, against 96 arrivals on the China coast and 130 arrivals in the region of Taiwan and the Pescadores (Area 98) for 1620-29. The background to this spectacular growth was the extensive military campaign launched by the VOC when they had freed up their military capacity by settling their position on the Spice Islands. No longer did the VOC confine itself to a blockade of the Philippines, (which in the early 1620s was even conducted with a joint Anglo-Dutch fleet), to intercept trade between China and the Spanish, but they actively en-

gaged in action on the coast of China itself. These actions were not very successful, but they did lead to the establishment of the earlier-mentioned VOC stronghold on Taiwan. The VOC, however, remained excluded from the Chinese market itself and had to find alternative sources of Chinese products.

Apart from the military actions, a regular shipping route between Batavia and Taiwan and Japan was developing with an increase in the frequency of the stopovers in this region: Thailand, Cambodia and Vietnam (Areas 93, 94 and 95) were visited 92 times, which represented an explosive growth. Thailand, where Ayutthaya high up the Menam river in the heart of the country had now replaced the semi-independent Patani on the peninsula as the place for VOC trade, and had become an important destination to purchase merchandise for Japan together with rice and timber for the VOC settlement on Taiwan. A picture emerges, during this period, of shipping specifically intended to cater for the supply of consumable products and building materials for the VOC settlements. Food was shipped over long distances; for example, Japan was supplying rice and wheat for Batavia (the need for food in Batavia had also grown because of problems with the local authorities of Bantam and Mataram).

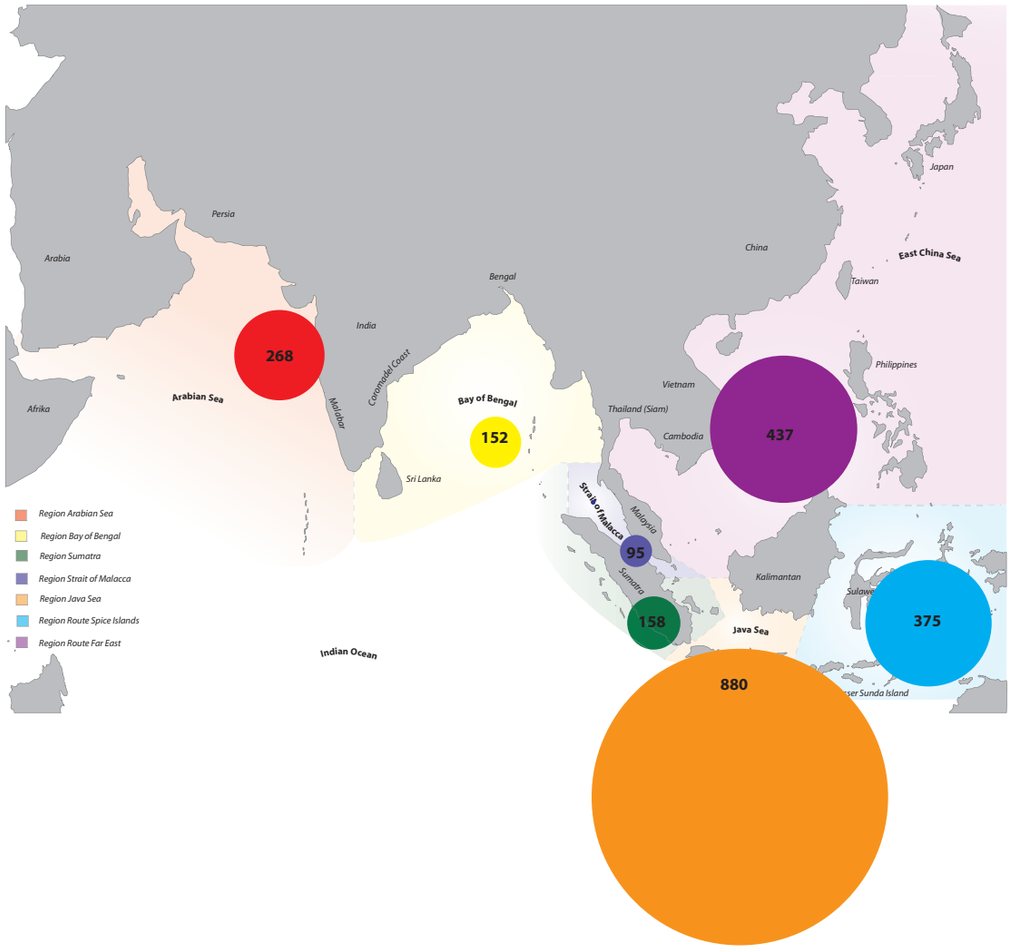
The frequency of shipping to Japan nearly doubled and the number of the VOC ships sailing to Hirado (Firando) increased by more than 100%, despite the fact that the VOC's shipping to Japan totally ceased for three years in 1629-1632 because the Japanese did not accept the VOC's authority on Taiwan. Eventually the conflict was settled to the VOC's advantage since shortly after the 3-year hiatus they gained a favourable position over their other European competitors as the only Christian nation allowed to trade with Japan. This policy of isolation by the Shogun brought strict regulations but an overall benefit for the VOC. In the previous period some attempts were made by Specx to make Japan a VOC logistical centre but this was no longer practical or feasible. The restrictions linked with the position of the VOC in Japan were too strict, the function as a staging post could be taken over by Taiwan.

At the other end of the Asian network in the northwestern regions of the Indian Ocean (Arabia with Mocha as the most important harbour, Area 31 and Persia with its port Gamron, Area 32), later called the *Westerkwartieren,* shipping had also increased substantially. After some experimentation with shipping to Persia and Mocha in the previous period, this route now became well established with 51 arrivals. Together with this development, there was also a substantial increase in shipping voyages with Surat as both a final destination and as a stopover for voyages to or from Persia and Arabia (78 arrivals).

The Period 1630-1639

In the previous periods, the trade and shipping networks of the VOC had started to take shape. In the period after 1630, shipping intensified and the emphasis on certain destinations changed for various reasons. The total shipping in Asia increased less spectacularly than in earlier periods but, nevertheless, still increased by 23% for ship movements and 17% by total volume.

In general, all the regular shipping routes were more or less in use by the VOC in the 1630-39 period. No new destinations were added and only in a few cases did the actual harbour within a destination sometimes change. For core destinations like the Spice Islands, the frequency and volume of shipping could vary according to the type of ships that were sent. Because the military operations against the Iberians had been shifted away from the Philippines to other areas, shipping to the Moluccas and the Sulu Sea dropped considerably. Regular shipping took place to Sumatra (pepper for textiles) and from Batavia to Taiwan and Japan. The only new route that came into service was the direct one from Taiwan, through the Strait of Malacca (avoiding a stopover in Batavia) to the *Westerkwartieren* and the Bay of Bengal. The trade position of the VOC in Persia improved considerably. Precious metals and copper from Japan and China, and sugar from Taiwan and China, were exchanged for silk, other textiles, indigo and saltpetre along this route. This development is reflected in an increase in arrivals of 35% to the region of Taiwan, 100% for Persia and 40% for northwest India. Only Arabia proved to be less profitable than previously expected and the frequency of voyages dropped to about one ship every year.



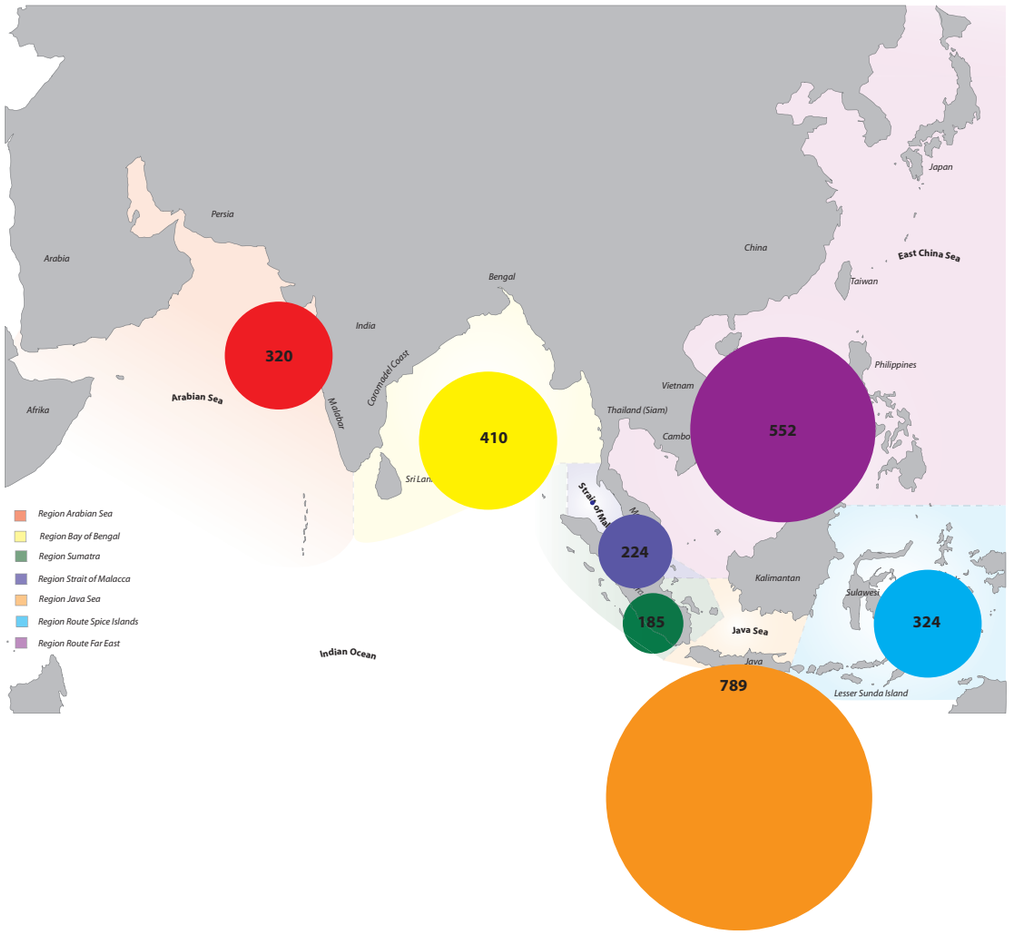
Map 8.4: Development of the frequency of the VOC shipping 1630<1640

The VOC's military actions were redirected from China (visits dropping to half the number in the previous period) to the Portuguese stronghold of Malacca, which showed a 75% increase with 95 arrivals, Goa, with 63 arrivals as against only 5 in the pervious period, and Ceylon with 41 visits. Large men-of-war were sent to these latter regions, in most cases to organise a blockade. The volume of the shipping to the Strait of Malacca did still remain relative low. Some of these ships were also used for trade with VOC-friendly ports in these areas.

The Period 1640-1649

The total amount of shipping in Asia in 1640-49 again showed an increase of 19% over the previous period and the volume increased by almost 50%. The reason for this and the previously noted differences between frequency and volume will be explained later in the composition of the VOC fleet in Asia. Significant changes during this decade were the capture of the Portuguese strongholds of Malacca and Galle. Malacca became a strategic rendezvous on the route from Taiwan to the *Westerkwartieren*. Galle gradually developed into an important emporium for the transhipment of products from Bengal, Coromandel, Surat and Persia. The development of both areas can be seen very clearly in the figures; shipping volume to both areas increased five-fold over the previous ten years surpassing Taiwan and the Spice Islands in importance. The VOC had a well distributed network of destinations where products could be exchanged and transhipped from ships occupied in local and regional trade to ships engaged in inter-regional and intercontinental shipping to Europe. Independently of their function as

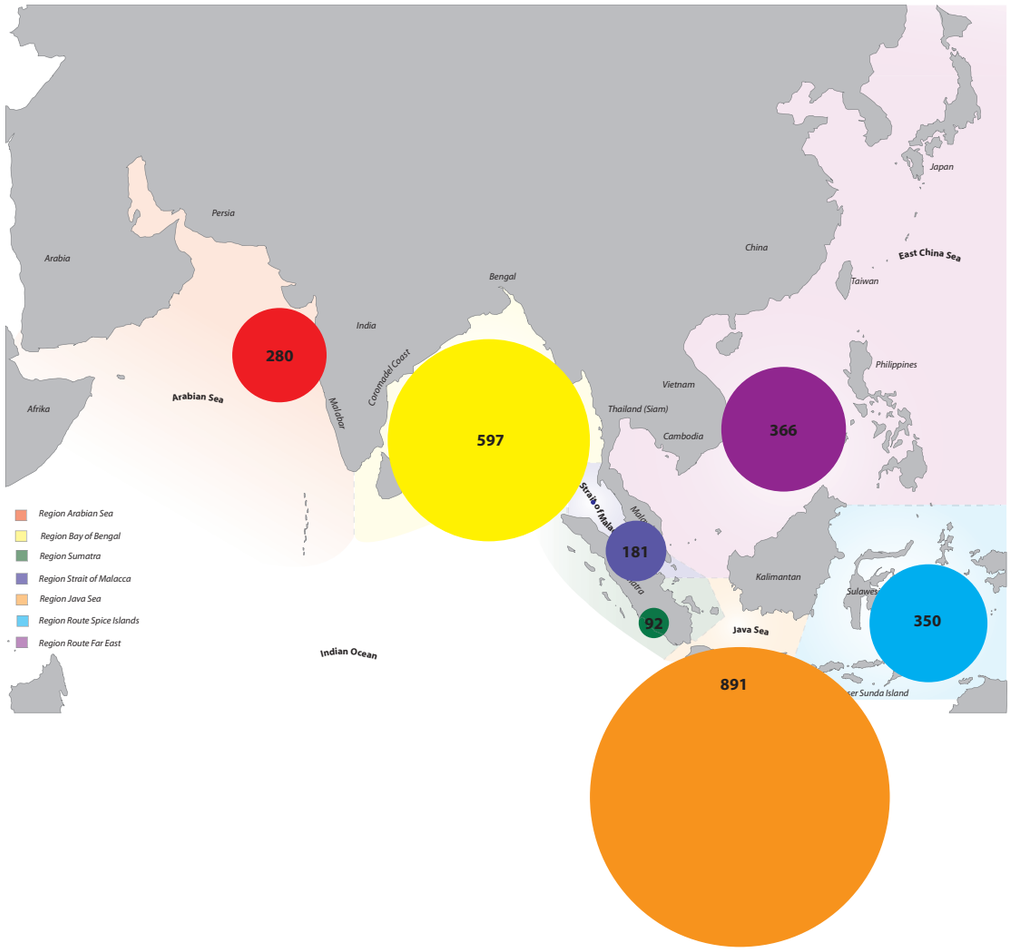
emporia, these ports also played a significant role in the trade of local products, which were important for the intra-Asian trade. However, the disadvantage in this development was an increased burden on the VOC's logistical organisation to supply these places with food. In fact, a direct route between Malacca and Siam was established for this express purpose.



Map 8.5: Development of the frequency of the VOC shipping 1640<1650

The Period 1650-1659

The number of voyages within Asia declined in this period by 2%, and the volume by 8% compared with the period 1640-1649. The loss in shipping activity in the areas around the Chinese Sea was not fully compensated for by the growth in other areas. During this decade, the capture of Ceylon from the Portuguese was finally accomplished. The VOC then concentrated on extending its influence in South India on the Malabar Coast (Area 37). The sharp increase in visits to this area had already begun in the previous period (and increased in this one), while the purely military actions at nearby Goa (Area 36) do show a declining tendency. The Malabar Coast was only partly visited for military reasons, but this destination did become important for its pepper and also as a food supplier for Ceylon. The increase in the Malabar pepper trade is mirrored by a sharp decrease in visits to the pepper harbours at Sumatra (Areas 52 and 53). During this period the English, especially in the regions of Surat, Persia and Arabia, replaced the Portuguese, as the traditional enemy.



Map 8.6: Development of the frequency of the VOC shipping 1650<1660

The interests of the VOC in the Bay of Bengal are clearly illustrated in the consistently high level of voyages to the Coromandel Coast (Area 43) and the doubling of visits to the northeastern area of this Bay (Area 44, approximately modern Bangladesh and Area 45, approximately modern Myanmar).

The establishment of the VOC stronghold on the Cape of Good Hope would bring an important improvement in the logistics of intercontinental shipping in the future. For the time being, however, it could hardly supply itself with food and labour and for that reason was also cause for some renewed interest in the region of Eastern Africa, Madagascar and Mauritius.

On the traditional route to the Spice Islands, the Island of Sulawesi (Area 84 with Macassar, modern Ujung Pandang as most important destination) showed consistently steady growth as an important stopover for supplies but also in serving its military purposes. The VOC put pressure on the local rulers in an ongoing conflict about the "smuggling" of cloves. In the 1660s this would lead to some VOC expansion in this region.

The situation in the Far East became more difficult for the VOC, where shipping to Taiwan and Japan already showed a steady decline. Regulation of trade with Japan became stricter (less copper could be exported) and it became more difficult to get Chinese products as a result of the internal situation in China and the actions of Coxinga, the self-styled pirate king of Taiwan. Soon the VOC would lose its stronghold in Taiwan to this Chinese warlord and Taiwan would cease to be a VOC destination. That development does, however, fall just outside the scope of this book.

9

Fleets per region

The complex activities of the VOC in Asia are reflected in the composition of the fleet in Asia. In order to further examine the logistical development of the VOC and to assess how successful they were in their attempts to maximise their organisation we have to look more closely into where the VOC fleet was employed in Asia. In Chapter 5.9 the composition of the total VOC fleet up to 1660 is described. Based on the classification of the vessels into the ten rates, a general description of the features of the vessels was given.

The following specific rates have been identified:

Rate
00: undefined vessels
01: prefabricated vessels
02: miscellaneous vessels (< 70 last)
03: small yachts (< 70 last)
04: small to middle sized flutes (70-170 last)
05: middle sized yachts (70-170 last)
06: big flutes (> 170 last)
07: big yachts (>170 last)
08: ship (> 170 last)
09: big men-of-war
10: homeward-bounder

In this chapter, the use of these ships for the activities of the VOC is explored further; the nature of the shipping to the main regions is examined in more detail and the vessels used in these regions are analysed.

By looking at the features of the ships, the requirements of the region and the functions of the VOC together, a better insight can be gained into the complexity of building up a fleet that allowed the company to run their activities and business as efficiently as possible. The central aim in this chapter will be to examine the specific circumstances in the regions of the VOC trade and shipping network that could put requirements on the vessels that the VOC had in service.

During the development of the VOC shipping in Asia, the demands placed on ships were constantly changing. Although the physical-nautical conditions in the various destinations stayed the same in principle, within a given region, the condition of a harbour could change, as was the case in Taiwan where the entrance canal silted up, limiting the size of incoming vessels, or the harbour itself could be re-assigned, as for example, in Japan where the initial trading post in Hirado was moved to Nagasaki in 1641.

More often, the political-military circumstances in a region dictated the features of vessels sailing to these destinations. That did not simply mean the choice between sending men-of-war or trade vessels. It often involved a process of fine-tuning the best vessel that could meet the military needs, often in combination with the wish to trade. Accordingly, small patrol vessels replaced the men-of-war that fought the big Portuguese ships in the important Strait of Malacca in the period up to 1610. After some losses of large *Caraques* to the Dutch, the Portuguese provided better protection to their bigger ships and organised their other shipping on a

smaller scale. By replacing the big men-of-war with smaller swift sailing and shallow draught vessels, the VOC was able to frustrate the Portuguese and the local shipping which also used smaller vessels, and chased them for their loot.

The nature of trade and cargo in the various regions was also subject to change. The rate of the vessel to be sent depended on the availability of cargo. Was there sufficient cargo to be taken on in one place to justify the deployment of a large vessel, or did the cargo need to be collected from various places and ports. In which case could this be achieved more efficiently by smaller vessels?

Interpretation

The following are the main parameters that can reliably be said to have influenced decisions on the composition of the fleet in certain regions:

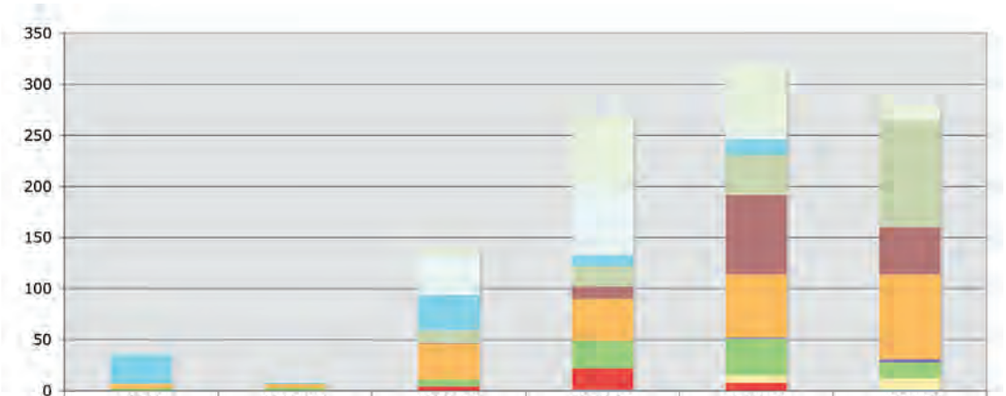
- Nautical-physical conditions in a region, like exposed versus sheltered waters, special weather conditions such as typhoon systems, narrow passages, shallow harbours etc.
- Political-military conditions in a region. This can be translated into the basic requirements for vessels with a military function and the type of warfare (offensive, defensive, well-armed European competitors, coastguard functions, etc) that could be encountered.
- Type of cargo and logistics of the trade. The type of cargo could also determine whether special vessels were needed for transport (e.g. elephant trade versus bulk trade in pepper).

The Arabian Sea (Westerkwartier) (Areas 31-38)

This region ranges from the Maldives in the southeast, the west coast of India to Persia and Arabia in the west. Conditions in these waters are characterised mainly by an exposed open ocean with a regular and predictable wind pattern. In general these conditions did not require special characteristics of visiting vessels. Only the harbour of Surat in northwest India (by the VOC named Suhali's com, the Bay of Suvali) had a shallow entrance with limited access. Since the city of Surat was located inland on a river that was difficult to navigate, the medium-sized and bigger vessels needed the assistance of smaller vessels to take their cargo ashore. Because they often had to load and unload precious metals, they needed reliable protection and support. In some cases, smaller vessels escorted larger ships to the Surat area specifically for this purpose. Although the nautical-physical conditions allowed every seagoing vessel to operate in this region in principle, the political-military realities did not. There was a constant risk of confrontation with heavily armed Portuguese or English vessels. The VOC exacerbated this already highly militarised situation by their initial raid on Goa in the early period and their annual blockades after 1636. Visiting vessels, therefore, needed to be heavily armed or be escorted by another defensible vessel. At some times these convoys could be easily organised because of the presence of a fleet of well-armed vessels for the Goa blockade. Nevertheless, it seemed most efficient for the VOC to attempt to combine the employment of a defensible vessel with a trade mission at the end of a blockade period or when the Portuguese force was considered to be fairly weak, such that, an early departure was possible for some of the blockade fleet. Combining the actions of blockade and trade mission was feasible because the type of cargo in this region did not require specialised cargo carriers. The vessels only needed a degree of flexibility owing to the diversity of the cargo, which could range from silk and horses from Arabia, pepper and rice from the Malabar Coast to the transport of elephants to India. A yacht like the Avondster (ID:871), which could transport soldiers and equipment, was rejected as a ship for the blockade but it could easily be employed elsewhere in the region, including the transport of elephants to the coast of Malabar. The route between Surat and Persia was the only region in the shipping network where the VOC allowed the transport of goods for private traders. The heavily armed vessels, initially the men-of-war (rate 9) and later the big war yachts (rate 7) met the requirements for this trade that had to be based on trust by the private traders. The VOC was reluctant to provide this service, but this trade could provide an essential supply of money

from Persia to Surat. The VOC tried to keep the profits for themselves but they had to accept that they could not control the situation in this region especially because the English facilitated the private trade with the consequence that 'therefore the Moors will never be pushed from the bench' (Coolhaas 1964, p. 35).

These activities placed emphasis on the military capabilities of the vessels that operated in this region. Therefore, generally speaking, one would expect defensible medium-sized and bigger ships to operate in the area. Trade was a secondary aim for these vessels. The pure trading vessels such as the flute could only operate in convoy. The smaller long haul traders were not suitable for this region.



	<1610	1610-20	1620-30	1630-40	1640-50	1650-60
10			7	66	65	16
9	2		38	69	9	
8	29	1	35	11	15	
7			12	20	39	104
6			1	12	78	46
5	5	4	35	41	62	83
4					1	3
3	2	3	7	27	36	16
2					7	11
1			4	21	8	
0				1		1

Table 9.1: The activity level of the various types of VOC vessels in the region of the Arabian Sea per 10-year period to 1660

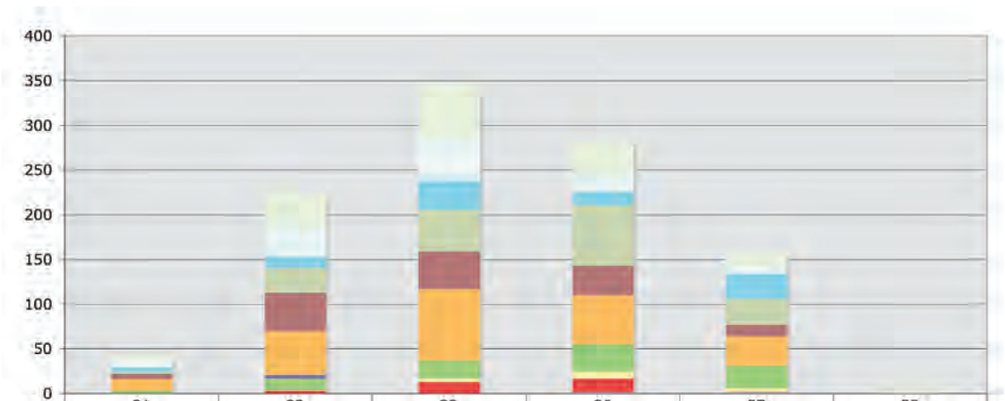
Table 9-1 shows the composition of the VOC fleet in this region up to 1660. In the early period the fleets sailing from Europe to Java often visited the west coast of India to attack the Portuguese headquarters in Goa. The composition of these fleets was not specially selected by the VOC for this region but reflected the typical unspecialised fleet of the time. In the period 1610-1620 the sailing route from the Netherlands to Java was redirected to the southern part of the Indian Ocean. After 1614 no fleets departing from the Netherlands passed this region anymore. From the 1620s a start was made with shipping to Persia and Surat. The bigger well-armed vessels above rate 7 were responsible for most of the activity in that period.

The vessels of rate 9 of the VOC, the men-of-war, were very active in this region. From 1621 on these men-of-war were gradually replaced by the *retourschepen*; firstly, in the Anglo-Dutch 'fleet of defence' and, after the cooperation ended between the two countries, as part of the VOC strategy to patrol against the Portuguese in the whole region from the east coast of Africa up to their headquarters in Goa. The *retourschepen* sometimes combined their military task with an experiment in direct shipping between the region and Europe.

Between 1636 and 1644 and again after 1654, shipping in this region was determined by the annual blockade of Goa. During the blockade and in the period of the truce, middle-sized yachts were also used in the region. The flutes, which were the pure cargo carriers, sailed to Surat and sometimes Mocha in convoy with defensible vessels. In 1639, for instance, the flute *Rarop* which was wrecked near Negombo in Ceylon a year later, had to be escorted from Mocha

to Surat by an armed yacht because the flute needed its canons in the hold for ballast (NA 1.10.30, Geleynssen de Jongh 138). During the period 1640-1650, peace with Portugal made it possible to increase the relative proportion of flutes to other vessel types in the shipping in this region.

From 1640 the *retourschepen* took on the role of rate 9 men-of-war because they were both suited to and available for this purpose. The role of the middle-sized yachts was unchanged as good defensible and well-sailing yachts for the blockade of Goa. Due to the shipbuilding policy of the VOC, as well as that of the Admiralty in the Netherlands of building bigger (war) yachts, these ships started to play an important role in the region after 1650 and in turn replaced the *retourschepen.*



	31	32	33	36	37	38
10	5	37	62	35	14	1
9	7	32	48	21	9	1
8	4	12	32	15	28	
7	3	28	47	68	29	
6	6	43	42	33	13	
5	13	49	80	55	33	
4		4				
3	3	13	20	30	25	
2		1	4	8	4	1
1		3	13	16	1	
0				1	1	

Table 9.2: The activity-level of the various types of VOC vessels in the separate destinations in the Arabian Sea region. 1595-1660 (areas in the first row of the table: 31. Arabian Peninsula, 32. Persia, 33. Pakistan and northwestern India, 36. Goa Area, 37. Malabaar, 38. Maldives)

Looking at the separate destinations in this region, there are no major differences in the role of certain types of vessels. So in general it can be concluded that this whole region required defensible vessels larger then 70 *last* that were able to combine military functions with trade. Convoys had to be organised for the pure merchant vessels.

Bay of Bengal (Areas 41-46)

This region comprises Ceylon in the southwest, the Coromandel Coast in the west, Bengal in the north and the Andaman coast in the east. In this region no heavy sea and weather conditions were expected. Most of the destination ports were subject to monsoon seasons but, provided the skippers' navigation was good, shipping to and from this region was possible throughout the year. As was the case with Galle, which was also, in theory at least, accessible all year round, only a slight miscalculation could take a vessel a mile downwind of the entrance and make it impossible to reach the harbour. So shipping between harbours within the region was strongly monsoon-dependent. The shallow river mouth of the Ganges and some destinations in certain seasons on the Coromandel Coast required shallow-going vessels[75].

Although many other international traders were present, as they were in the Arabian Sea region, no large-scale military confrontation with European competitors was expected during this period. In most cases, the skirmishes that did occur were with smaller Portuguese vessels (often private traders) when Dutch vessels cruised the area for booty. The VOC was the aggressor in most of these instances. There were campaigns to remove the Portuguese from Ceylon and some locations on the coast of Coromandel, but also to patrol against enemy traffic in the waters south of Galle. As explained earlier, this was a strategic region because it formed a "wind shed" between the Arabian Sea and the Bay of Bengal. Ships sailing between these regions had to orientate on the southern tip of Ceylon.

Since the VOC initiated the aggressive actions they were, therefore, able to select the vessels they thought most suited their operations. From a military perspective big well-armed vessels were not necessary, but on the other hand vessels that were too small would have been too vulnerable. Medium-sized vessels with a normal armament were, therefore, most suitable, accompanied by smaller boats to pursue their quarry into shallow waters.

The products shipped in this region were diverse. Once the VOC was established in Ceylon ample cinnamon was available. This product was shipped on almost any available vessel that was leaving the region for Batavia. Other cargo like the shipping of elephants to India required vessels that were or could be adapted for this special but not irregular transport (see Case Study 9-1).

For most other local and regional shipping of which foodstuffs and areca nuts were the most important, all smaller vessels were found to be suitable. There was also enough cargo, mainly textiles, available in various destinations on the Coast of Coromandel. Although the VOC also organised local shipping on a smaller scale to take the cargo to a central place, in general trade goods had to be collected from various harbours, which made the medium-sized vessels most suited to this purpose. The cargo from Bengal, comprising mainly saltpetre, silk and other raw materials, could be shipped by bigger trading vessels.

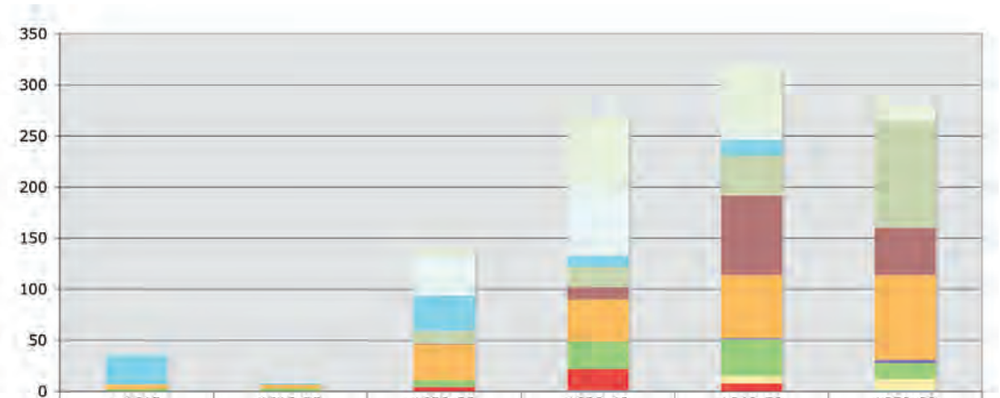
The slave trade in the region required bigger vessels like the *retourschepen* and big flutes. In 1622 the *retourschip Gouden Leeuw* (ID 186) was explicitly sent to this region '[to get] a crowd of slaves (that small ships cannot ship)' (Colenbrander 1921, p. 74). It becomes clear from the database that there was regular shipping for slaves in this period from at least 1617 when the *Gouden Leeuw* already sailed on this route. After 1622 other *retourschepen* took over the role as slave carriers. In 1623 and 1624 the *Wapen van Rotterdam* (ID 302) and the *Wapen van Enkhuizen* (ID 249) made three journeys to the region to ship slaves and rice to Batavia.

In view of the parameters described above, one can expect a diversity of vessels with an emphasis on the medium-sized trade vessels in this region.

Case Study 9-1. Elephant transport

One of the earliest elephant transports by the Dutch must have been in 1610 when the King of Candy honoured the Dutch Prince Maurits with two elephants . It is unknown what happened with these elephants, but soon the shipping of rare and unusual species to the Netherlands became popular. The Prince of Orange was a fancier of exotic animals. When Prince Maurits was offered a leopard in 1623 he announced that he would also like a little elephant or a cockatoo. His successor, Prins Frederik Hendrik requisitioned these animals from the VOC. To please him the VOC shipped on the return fleet of 1629, [: 'a *schoon gespickelt hert* (beautiful spotted deer), *steenbockie* (serow), two beautiful white birds called *kackatuwa* (cockatoo), a young elephant and two *Suytlantse catten* (cats from the Southland) (Coolhaas 1960, p. 277). The young elephant was called *Hanske* and would travel Europe as public attraction for 21 years. Loading the elephants was quite complicated. To ensure that the elephant was not spooked by the whole manoeuvre the walking path on the sides of the jetty were covered with branches and leaves. The small vessel that was to take the animal to the ship on which it was to be transported was also covered in greenery (L'Honoré Naber 1930b, p. 120). Hoisting the elephant on board was the next challenge. In 1654 an elephant escaped during a similar operation in the Bay in Galle and swam ashore (NA 1.04.02, VOC 1203, fol. 487-488). Once the problems of getting them on board were overcome, it is surprising how many elephants could be shipped. On one occasion up to

twelve were taken on board the *Neptunus* (ID:680) a medium-sized yacht of 150 *last* (Colenbrander 1902, p. 284).
Keeping the animals alive must have been the skipper's biggest concern. Vessels often had to make refreshment stops to take in fresh vegetables and water. Shipping live elephants also made demands on the available space for victuals. The requirements for the transport of 11 elephants were recorded in 1648 in his journal by a German crewmember who wrote that, in order to be able to transport the elephants on the flute *Heemstede* (ID:671), the accompanying vessels had to carry several hundred 'Pisang Bäume' (banana trees) that were known to be a food favoured by these animals. During the journey it transpired that owing to a shortage of drinking water two elephants died and the crew also had to suffer (L'Honoré Naber 1930a, p. 44).



	<1610	1610-20	1620-30	1630-40	1640-50	1650-60
10			7	66	65	16
9	2		38	69	9	
8	29	1	35	11	15	
7			12	20	39	104
6			1	12	78	46
5	5	4	35	41	62	83
4					1	3
3	2	3	7	27	36	16
2					7	11
1			4	21	8	
0				1		1

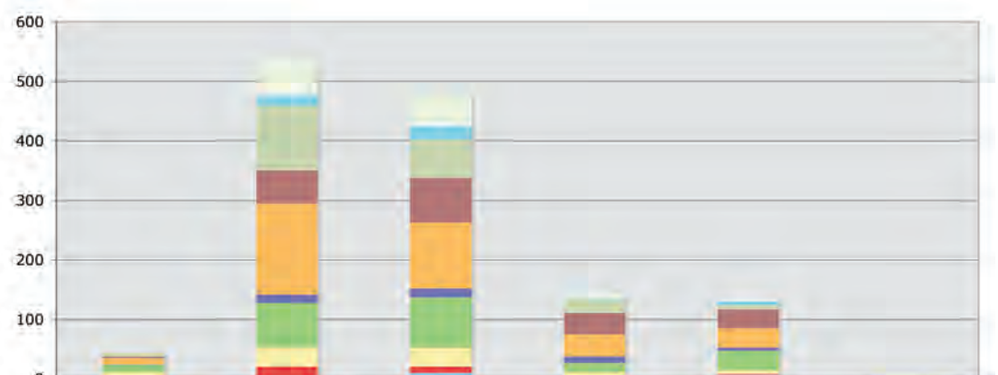
Table 9.3: The activity level of the various types of VOC vessels in the Bay of Bengal region per 10 year period to 1660

In the period up to 1610 this region was only visited by VOC-fleets which on their outward vayage to Java and the Spice Islands tried to attack the Portuguese strongholds at the Indian westcoast and Malacca. At a few occasions yachts were split of from these fleets to visit the Indian east coast. In the period that followed, safety and confrontations with the Portuguese were still major issues. The frequent presence of bigger, well-armed vessels in this region can be explained as follows. In the 1620s, the bigger yachts (rate 7) travelling more or less directly between the Netherlands and the Coromandel Coast were still popular. These ships sailed directly from the Netherlands to Coromandel and vice versa. Sometimes they sailed via Batavia back to Europe or from Batavia via Coromandel to the Netherlands. The growing contribution of the *retourschepen* (rate 10) was for the purpose of these trips between Batavia and the textile market on the Coromandel Coast but also as military vessels around the southern tip of India This latter function influences the statistics disproportionately. For instance, the *Dordrecht* (ID 219) patrolled the border of two regions between 1621 and 1623 and made three arrivals in a short period. The role of Ceylon as a junction of shipping routes also explains some other anomalies in the expectation of the types of vessels used in the Bay of Bengal as, the activities of the men-of-war (rate 9) can be explained through a visit of the *Nassausche* fleet on their way

to the Arabian sea. The *retourschepen* gradually played a more important role in Asia as the fleet of these big vessels grew and the VOC had more choice in using ships in various stages of their careers.

After 1630 the composition of the fleet shows a greater emphasis on trade and, therefore, on medium-sized yachts and flutes. For the local trade a sharp increase in smaller vessels can be observed. The preference for medium-sized yachts was already evident as early as 1611. A skipper and a merchant, probably experienced in shipping in Asia, advised the directors of the VOC to employ smaller swift-sailing vessels to the Coromandel Coast rather than the big ships. For efficiency these vessels had three decks, so the hold could be used for cargo, while the second deck could be used for victuals. As an experiment a vessel of 104 feet was bought in Amsterdam (NA 1.04.02, VOC 100, fol. 147). These rate 5 vessels turned out to be successful. They went through a steady growth and became the most intensively used vessels in the region.

After 1640 the VOC became more proactive in their military actions, mainly in Ceylon, and well-armed yachts were required; both the rates 5 and 7 show a sharp increase in the periods after 1640, partly due also to the re-gathering of the Goa blockade fleet in Ceylon.



	41	42	43	44	45	46
10		45	46	6		
9		12	8	1	2	
8		16	22	2	6	
7	6	108	65	21	7	
6	3	56	75	36	32	
5	10	153	111	37	32	
4	1	14	15	11	5	
3	13	75	85	15	33	1
2	9	32	31	7	6	2
1		18	11	2	2	
0	2	3	10	3	7	

Table 9.4: The activity level of the various types of VOC vessels in the separate destinations in the region Bay of Bengal, 1595-1660 (areas in the first row of the table: 41. Gulf of Manar, 42. Ceylon, 43. Coromandel coast, 44. Northeastern India, Bangla Desh, 45. Myamar, 46. Andaman Islands)

From the differences in the activity levels of the rates for the various destinations in the Bay of Bengal region (Table 9-4), it becomes clear that Ceylon was the pivotal point for shipping and the connection with other regions (e.g. for blockade fleets to Goa and ongoing shipping between east and west). The role of the smaller vessels also becomes apparent from the detailed analysis of the local shipping from Ceylon. In the years of Galle's isolation immediately following its capture from the Portuguese and when it was without a hinterland, some small vessels were essential for the supply of foodstuffs and for communication. These vessels also took part in the blockades of Colombo.

As expected, the contribution to shipping of yachts and flutes as pure cargo carriers in this region is prominent. The greater role of yachts in Ceylon compared with other destinations is mainly due to military action around Ceylon. Flutes were suitable for the local cargo but the

main reason for their presence was the direct route that was opened between the Far East and the Bay of Bengal; flutes were the ideal vessel for shipping from Taiwan (see below).

Rate 10 *retourschepen* made a substantial contribution to the activity level for both Ceylon (Area 42) and the Coromandel Coast (Area 43). The role of rate 10 vessels in the slave trade to the Coast has already been explained above. This trade was later shifted from the Coromandel to Bengal and Aracan, and big flutes then replaced the *retourschepen*. After 1630 the *retourschepen* were more active in military matters in the Arabian Sea. On their journeys to and from this region they visited the Bay of Bengal, traded at the Coromandel Coast and, between 1638 and 1644, engaged in military activities in Ceylon including the transport of troops. An example of military actions by a *retourschip* in the region was the *'s Hertogenbosch* (ID:503). In 1639 the ship left Batavia for a trip to Europe via Mallaca and Ceylon. On New Year's Eve of that year it anchored on the roadstead of Colombo and fired 100 shots on the city. The next day the ship and the flute *Rarop* ran aground near Negombo. The flute was wrecked but the *'s Hertogenbosch* was able to free itself and sail back to the Netherlands (NA 1.04.02, VOC 1134, fol. 235). This must be considered an irregular action since it seems impractical to send a loaded *retourschip* on such a military mission. Most ships of this rate visited Ceylon between 1638 and 1645 on their voyages to and from the blockade of Goa. Around 1644 these ships were also used for troop transport to Ceylon.

After 1640, when the direct route between Taiwan and the Arabian Sea was established, even new *retourschepen* were employed. Various ships like the *Banda* (ID 523), *Vrede* (ID 721) and *Schiedam* (ID 757) made an 'Asian grand tour'. In general they sailed from Batavia to Taiwan and from there through the Strait of Malacca and along Ceylon to Persia. On their return trips they visited Galle (after 1644) and sailed via the Coromandel Coast back to Batavia.

Since this trade included valuable items such as silver from Japan and silk from Taiwan the ships needed to be strong and easily defendable. After the truce with the Portuguese in 1645, strong though less easily defensible flutes could replace these ships. Around 1650 the Malabar pepper market increased in importance. Between 1646 and 1651 Galle was visited by older *retourschepen* like the *Banda* (the same return ship as above, now considerably older, but still going strong), *Maastricht* (ID 549) and even the *Nassau* (ID 412), built in 1627 and more then 20 years old on their trips to load pepper on the west coast of India and cinnamon in Galle. Compared with the rich cargo transported from the Far East, pepper and cinnamon did not represent much value for the local market; these products only became valuable on the European market, so the VOC could take its chances by using less reliable cargo vessels (Maastricht did indeed sink on its voyage back to Batavia owing to the worn-out state of the ship).

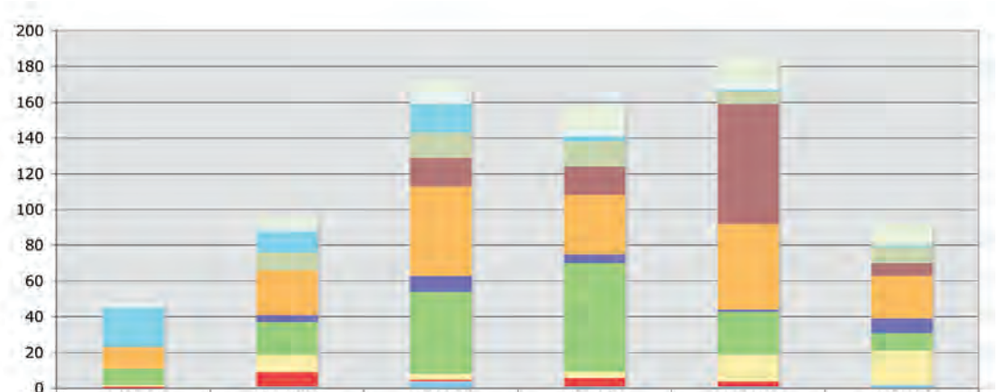
After the war with the Portuguese was resumed in 1653, *retourschepen* were sent from Batavia for military activities in the Arabian Sea. On the return trip back to Java they picked up cargo in the Bay of Bengal region.

Sumatra (Areas 51-53)

This region includes the whole of the island except the regions of the Strait of Malacca and Sunda. Within the region there are three principal areas. Banda Aceh in the north was an important pepper harbour in the early period but unreliable due to the political situation. The VOC developed their main pepper sources on the southeast and the west coasts. The conditions on the west and the east coasts were completely different. The pepper harbours on the west coast were exposed to the ocean, but the weather patterns were predictable. These conditions required well-constructed vessels. The conditions on the southeast coast were much more sheltered. The bottleneck there was the accessibility of the harbours. The pepper had to come from locations up river. The logistics of this destination called for smaller vessels often in combination with bigger vessels that could take in cargo on anchor off shore. Apart from the earlier period around Banda Aceh, there was almost no military activity in this region and hence no requirement for a military function.

The cargo consisted of pepper to be exchanged for textiles. On the west coast, trade was divided between various harbours, which could best be done with medium-sized flutes and

medium-sized and big yachts. On the southeast coast all ship types could be expected as long as smaller vessels were available for carrying the cargo from the shore to the bigger ships.

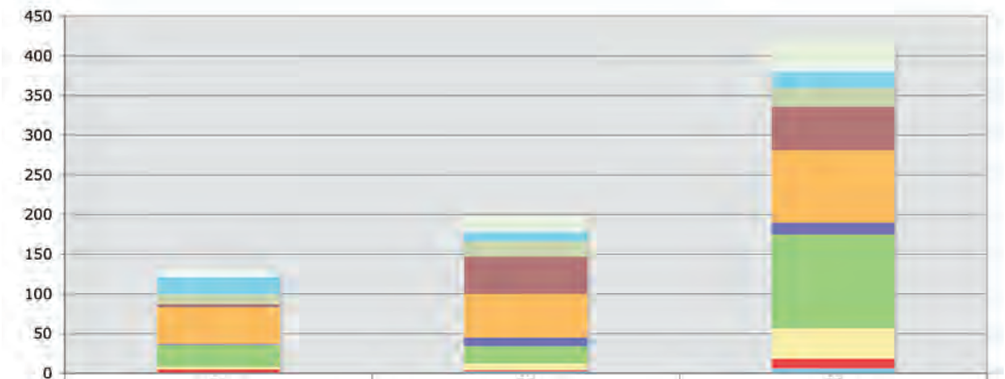


	<1610	1610-20	1620-30	1630-40	1640-50	1650-60
10		4	5	13	14	12
9	3	3	8	4	4	
8	22	12	16	3	1	1
7		10	14	14	7	9
6			16	16	67	7
5	12	25	50	33	48	24
4		4	9	5	1	8
3	9	18	46	61	24	10
2	1	10	3	3	15	19
1	1	8	1	5	3	
0		1	4	1	1	2

Table 9.5: A representation of the activities of the various types of VOC vessels in the region Sumatra per 10-year period up to 1660

In the period to 1610, activities were mainly focused on the then important destination, Banda Aceh. The emphasis was on defensible vessels that could operate in an area of high political tension and military confrontation with the Portuguese. From 1615, in the second period, the VOC started some experiments with smaller vessels to develop the pepper harbours in other parts of Sumatra. Consequently, an increase can be observed in rates 1 and 2 and later, after 1620 in rate 4. As a bigger capacity cargo carrier, the rate 6 flute was popular. The heyday of Sumatra's pepper trade was up to 1650. After that pepper came more and more from the coast of Malabar. The relatively high component of the rate 3 and 5 vessels can be explained through their military function in the neighbouring region of Malacca. The southeast coast of Sumatra was close to Batavia and also along an important intersection of all the major routes. The shipping in this region, therefore, also reflects the total VOC shipping in Asia.

As Table 9-6 shows, in Area 53, South East Sumatra, all rates are represented. Apart from the defensible vessels that could take in pepper on their way to Batavia, the flutes on their way to Taiwan also sometimes stopped over for pepper after 1630. Even ships in a poor condition could often make a short trip to fetch pepper. The high component rate 10 *Retourschepen* are specifically linked to the logistics of cargo loading at Batavia. From the reconstruction of the cargo gathering of the *retourschip Hollandia* (ID:237) in Chapters 4 and 7, the problem of having the right cargo available at the right time to be able to load the return fleet for its departure around the turn of the year became clear. With the passage of time a system was set up in which the *retourschepen* sailed with the right ballast from Batavia to Jambi on the southeast coast to load pepper. Returning to Batavia, the rest of the available cargo space could then be filled with products that had just arrived from other regions such as the silk that was rushed to Batavia from the Far East.



	51	52	53
10	2	15	31
9	8	5	9
8	22	12	21
7	12	19	23
6	4	47	55
5	46	55	91
4	1	11	15
3	28	22	118
2	3	8	39
1	4	2	12
0	1	2	6

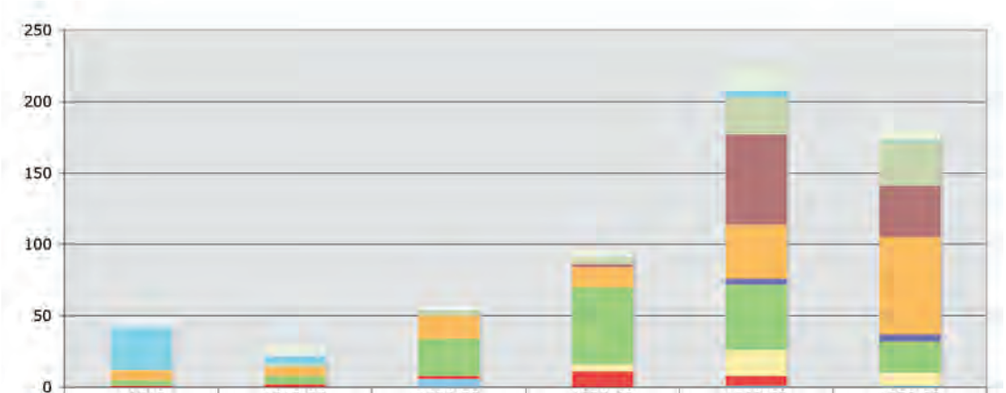
Table 9.6: A representation of the activities of the various types of VOC vessels in the separate destinations in the region Sumatra 1595-1660 (areas in the first row of the table: 51. Atjeh, Nicobar islands, 52. Sumatra westcoast, 53. Sumatra southeast)

Strait of Malacca (61)

This region includes modern Malaysia and Singapore. All the waters in this region were more or less sheltered. Some areas of the Strait of Malacca were cluttered with small islands that required manoeuvrable and shallow draught vessels if the VOC patrolled in these areas. The strategic value of Malacca was high. The strait was an important connection between the Far East and the Indonesian Archipelago and the Indian Ocean. Sunda Strait, the second important connection was already under the control of the VOC. Controlling this important seaway was an important strategic goal. Right from the start of Dutch shipping in Asia the Strait of Malacca was an important military destination. To begin with the military confrontation was on the level of big ships. In later years the character changed to patrol activities aimed at disrupting the traffic and capturing smaller vessels. After 1640, when control of Malacca was taken from the Portuguese, the position was safeguarded by the patrol of small, swift sailing and well-armed vessels. The requirements for suitable vessels for this important task were thus changing over time.

Up to 1640 the military component of the fleet was the most important. This is reflected in Table 9-7 that shows a big component of the small yachts of rate 3. These swift sailing *fregatten* were ideal for chasing passing traffic. The middle size yachts of rate 5 also took part in the blockade. As was the case in the blockade of Goa the ships taking part in action around Malacca could be used for trade after they had finished their task.

After 1640 the military component of the fleet became less prominent and one can see a growth in cargo vessels such as the flute. Given the central role of Malacca in the whole traffic network it is to be expected that the database will reveal all types of vessels including many cargo carriers. Many of these vessels are recorded on their stopover for transhipment. Before 1640, the cargo from this area consisted mainly of looted goods. More regular merchandise following the capture of Malacca was pepper and pewter. Like Jambi, Malacca was brought



	<1610	1610-20	1620-30	1630-40	1640-50	1650-60
10		3		2	15	8
9	4	3	2	2	1	
8	30	6			5	1
7		2	4	5	26	31
6				2	63	36
5	7	6	16	14	38	68
4					4	5
3	4	6	26	54	46	22
2				5	18	9
1	1	2	2	11	7	
0			6		1	1

Table 9.7: A representation of the activities of the various types of VOC vessels in the region Malaysia by 10-year period up to 1660

into the system of loading the *retourschepen* with pepper before they left for Europe. The pewter trade to destinations in western Asia did not call for special vessels, and pewter cargoes could be picked up by most available (or passing) bigger vessels. The safeguarding of the production areas along the Strait of Malacca where the VOC strived for a monopoly required small, armed vessels. It were these smaller vessels in particular that stayed in a region (rather than arriving there from another area) that are not visible in the database statistics. For instance, we know that the vessel *Punto de Gale* (ID 669), which was probably captured during the raid on Galle in 1640, was active in the Strait of Malacca between 1642 and 1644 but its activities are not recorded in the statistics because they did not involve inter-area trips.

Case Study 9-2 The fleet at Malacca

In the period 1633-1635 the fleet in the waters of Malacca was operating under the command of Jacob Coper. It was his task to have a fleet of various types of vessels ready at the moment the monsoon would allow easy passage through the strait.

'The waters east and south of Malacca till mid-May, when the southern monsoon is blowing forcefully and no enemy vessel from the North can be expected, needed to be occupied […] and be alert for the Portuguese vessels that in principle will arrive with the northern monsoon from the coast of India, St Thome and Ceylon' (Colenbrander 1898, p. 294).

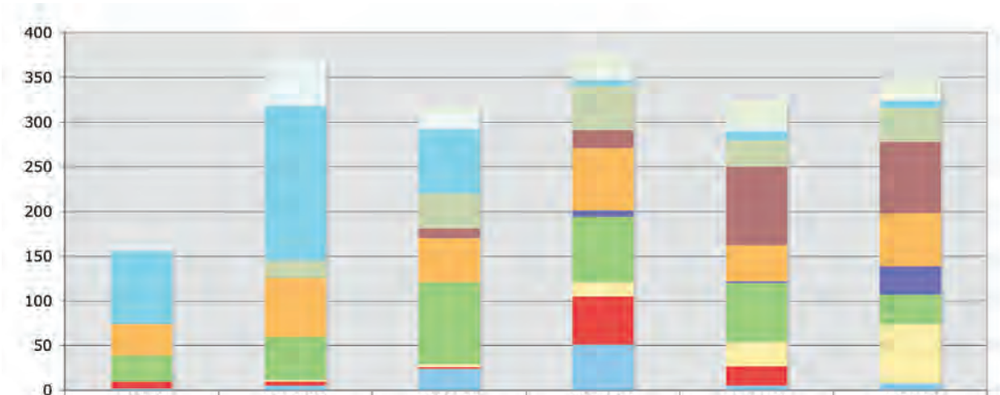
To make his fleet fit for the anticipated chase, Coper had his vessels beached and the hulls cleaned and maintained with materials received from Batavia: '[…] the yachts as much as possible prepared, … … on the 18th [May] [we] sailed with the whole fleet to Malacca [where we] stranded a certain Portuguese ship of about 100 last coming from Goa […] [and chased] a certain Portuguese ship of about 180 last […] and ran it aground and scuttled it' (Colenbrander 1898, p. 385).

For purposes of pursuit the Commander had at his disposal smaller swift sailing vessels, often captured from the Portuguese. During his term as Commander, Coper used various captured rate 3 and rate 5 vessels. His fleet in 1634 consisted of 13 vessels: one prefabricated rate 1 vessel, three vessels of rate 3 and nine medium-sized yachts of rate 5. Five vessels of this fleet were captured from the Portuguese. For the Commander and the crew it probably meant long months on relatively small vessels. To

keep their seamen on the job the VOC sometimes employed unorthodox measures. Jacob Coper had been given permission to return to Batavia with his men to crew a *retourschip* to return to Europe. The directors in Batavia were afraid that the blockade would become inefficient after his departure so they decided to: ' order [Coper] to stay with his fleet and to prevent his arrival here he can stay with his wife whom we will send from here, which the Honourable Gentlemen believe to be the biggest occasion for him to long to stay there' (Colenbrander 1898, p. 396). Now in the company of his wife, Jacob Coper ran a successful campaign in Malacca against the Iberian enemy.

Spice Islands (Areas 85, 86 and 88)

This region encompasses Ambon and Ceram, Banda, and the Moluccas. In this analysis the destinations and stopovers on the route to the Spice Islands are also considered. This route stretches from East Java and Bali (Area 81), the Lesser Sunda Islands (Area 82) to and Sulawesi (Macassar, Area 84). The central pivotal point was Ambon, the location where almost every vessel sailing in this part of the region would pass. The area east of the Banda islands, with destinations around the Arafura Sea (Area 87) is also included in this region.



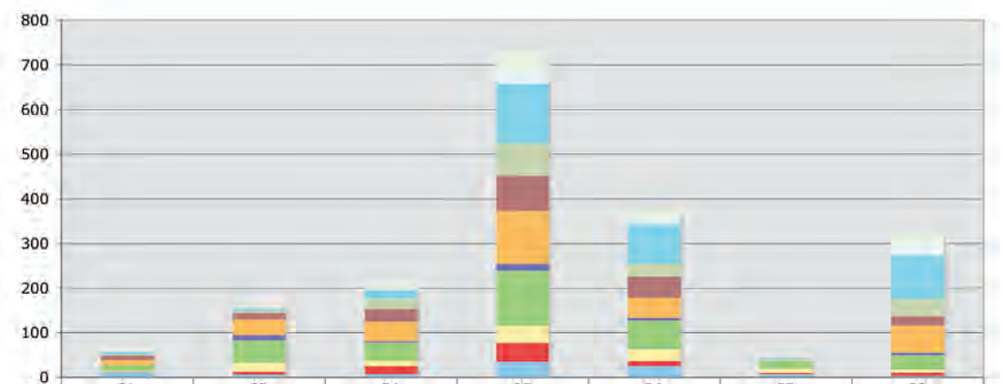
	<1610	1610-20	1620-30	1630-40	1640-50	1650-60
10		1	7	18	26	22
9	5	52	18	10	8	4
8	82	173	72	6	10	8
7		20	39	50	30	38
6			11	20	88	80
5	35	65	49	70	40	59
4				7	2	32
3	29	48	92	73	66	33
2		2	3	16	27	66
1	8	5	2	54	22	
0	2	5	24	51	5	8

Table 9.8: The activity levels of the various types of VOC vessels in the Spice Islands region per 10 year period to 1660

As the waters to and in this region were sheltered and there were good anchorages near the various destinations, in principle there were no limitations of a nautical nature such as strong monsoons or hurricanes. Nevertheless, it did take the Dutch time to discover the best anchorages; in the first period they lost the ships *China* (ID:94) and *Walcheren* (ID:98) and in the second, various ships missed Banda. Every rate of vessel from an open sloop to the biggest *retourschip* had access to these waters. The only serious limitation was caused by the monsoon system, so this region was only accessible during that season. Although some experiments were

carried out with smaller vessels that could sail against the favourable winds, or along alternative routes, most vessels had to stick to the monsoons.

The political-military aspects of the fleet composition were developing and changing over the whole period. In the early years of the VOC in Asia the power in this region had to be wrested from the Iberian competition and protected against possible English influence. After the monopoly was established around 1620, no further threat was expected from the European competitors. The VOC's main concern was to maintain its power base in relation to the local rulers and against traders that could break through the VOC's exclusive rights to the trade in spices by smuggling. Banning the local trade placed the VOC under an obligation to organise the supply of essential foodstuffs and other products to this region themselves. This, together with supplies for the extensive group of military personnel in the many fortifications, took up a substantial volume of transport capacity, which was however balanced by the availability of enough cargo to be shipped out of the region. The spices, mace, nutmeg and cloves were available in constant quantities and made shipping with large cargo carriers efficient.



	81	82	84	85	86	87	88
10	3	2	5	31	17		16
9	1	2	7	42	14		31
8	5	4	19	133	88	3	99
7	3	7	24	72	29	4	38
6	10	14	28	79	48		20
5	12	35	44	119	45	1	62
4		12	3	15	6		5
3	12	50	42	124	64	16	33
2	2	20	11	38	26	10	6
1	1	7	18	42	12	3	8
0	12	6	7	35	25	7	3

Table 9.9: The activity level of the various types of VOC vessels in the separate destinations in the Spice Islands region 1595-1660 (areas in the first row of the table: 81. Bali, east Java, 82. Lesser Sunda Islands, 84. Sulawesi, 85. Ambon, Buru, western Ceram and adjacent islands, 86. Banda Archipel and eastern Ceram, 87. Arafura Sea, 88. Molucca Sea)

The general development of this important region that formed the VOC's core business right from the start, is characterised by a shift from a highly military operation to a situation where a minimal military presence made a maximal impact on trade possible. In Table 9-8 the translation of this development into the activity levels of the various vessel types is clearly visible. Up to 1620 the vessels that were capable of military action (i.e. the big yachts, ships and specifically the men-of-war) were responsible for 60-70% of the shipping activities around the Spice Islands. These vessels were involved in full-scale confrontations with the Spaniards, Portuguese and the English. After the VOC got the upper hand around 1620, smaller vessels replaced these bigger military vessels to protect the monopoly against private traders. Only at Ternate was at least one man-of-war stationed against a possible Spanish attack from the Philippines. After the situation had stabilised, the VOC began the process of differentiating their fleet. The principle was to send textiles, (the main barter items for spices), supplies and staff on the big cargo car-

riers. *Retourschepen* rate 10 were not ideal for this purpose as long as they were employed on the route back to Europe since they could not arrive back in Batavia in time for the departure of the fleet to Europe around the turn of the year as the monsoon was only favourable from around April. Therefore, the older rate 8 cargo carriers from the early period or comparable old cargo carriers that were explicitly sent to remain in Asia played an important role in transport in the 1620s. After 1630 flutes and the older *retourschepen* that were no longer fit for a return voyage took over this role. The vessels that were only suitable for the transport of goods and cargo were dispatched around the change of the monsoon in order to avoid a long delay in the region while they waited for favourable winds. This also fits in with the ambition of the VOC to use their fleet all year round. For instance, flutes returning from the Spice Islands just after the turn of the monsoon in April could then still make a trip to the Far East.

For multi-purpose vessels like the middle-sized yachts (rate 5) the situation was the opposite: they had to stay in the region for as long as possible during the favourable monsoon season. Their main task was to secure the monopoly against private traders. So some middle-sized yachts arrived at the earliest possible time after the turn of the monsoon to prevent other ships from entering the region. They returned to Batavia at the latest possible time, or they stayed in the region. The activity level of the rate 5 vessels were stable at around 50 ship movements per 10-year period but reached a high in the 1630s. Locally, most of these vessels operated between the destinations of Ambon, Ceram (62) and Moluccas (66) where many small islands produced the desired cloves. To protect the harbours and also ensure that the monopoly was not broken the VOC needed the smaller vessels of rates 1 to 3. During the period up to 1630, small yachts like the *fregats* in rate 3 played an important role in the establishment of the VOC's power base at a local level. Similarly to the situation in the Strait of Malacca, these vessels were well equipped to control the shipping.

In the analysis of the activity level in the various destinations (Table 9-9) in this region, it is clear that Ambon served as the central destination in the Spice Islands. After the situation had stabilised in this region there was little need to send militarily equipped vessels to destinations like the Banda Islands, far away from the mainstream of shipping. It is important to note that destinations on the route to the Spice Islands were visited as stopovers and to collect supplies, but they could also be independent destinations from Batavia.

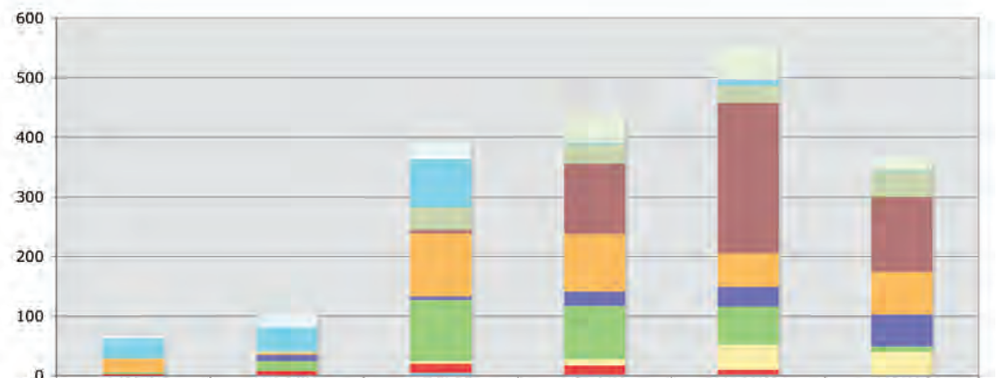
The "Far East" (Areas 92-99)

This region centres on Taiwan (Area 98) and Japan (Area 99) as the main destinations. China (Area 97) and the Philippines (the islands at the Sulu Sea, Area 96) were derivative destinations: the VOC was active in the waters of the Philippines in their attempt to frustrate the traditional trade between Chinese merchants and the Spaniards who exchanged the sought-after Chinese products like silk for silver from Mexico. So China was, in a way, the main reason for the VOC's presence in the region but the actual amount of Dutch shipping to China was minimal due to the Chinese ban on the Dutch from landing on the Chinese coast. The VOC, therefore, found an alternative destination in Taiwan that they could control; firstly, as a regional emporium for the exchange of products, and later also for some local products like deerskins and sugar. Thailand (Area 93), Cambodia (94) and Vietnam (95) were alternative destinations for the purchase of "Chinese" products en route to Taiwan and Japan. Thailand was also a trading source for food and wood for Batavia. Sarawak (Area 92), the area on the north coast of Kalimantan was only visited by some wayward large ships from the *Voorcompagnieën* and very few small vessels in later years. All these areas are situated along the shores of the South and East China Seas, but are, for reasons of convenience, also often called by their traditional name "Far East" in this book.

As the waters around China, Taiwan and Japan were considered dangerous due to the typhoons, strong well-built ships were required. The Chinese coast, although only visited occasionally for military reasons, demanded easily manoeuvrable vessels to negotiate the narrow channels between the many islands. Physical conditions in Taiwan also put severe limitations on visiting vessels. The entrance to this VOC post was so shallow that only vessels with a

draught of less than 11 feet could enter and bigger ships had to anchor in the rougher waters outside or at the Pescadores. In the early stage of the Dutch presence in this region there was an unsuccessful military attempt to establish a position on the Chinese market. After the Dutch had set up a post in Taiwan – the backdoor to the Chinese market – confrontations only took place on the instigation of the VOC until 1660.

Given the physical characteristics of the Chinese coast with its small islands, well-armed swift-sailing vessels were required. In the 1630s the destinations Vietnam and Cambodia were engaged in internal power struggles in which the VOC involved itself. Well-armed yachts could best counter this type of conflict in which large confrontations with heavily armed ships were not expected.



	<1610	1610-20	1620-30	1630-40	1640-50	1650-60
10			4	42	52	21
9	4	21	26	3	5	
8	33	39	82	2	9	2
7		4	37	34	28	43
6			6	118	252	126
5	23	3	106	97	57	71
4		10	6	24	33	54
3	3	17	102	89	64	9
2			5	10	42	39
1	3	7	15	16	8	
0		1	5	2	2	1

Table 9.10: The activity level of the various types of VOC vessels in the region of the South and East China Sea per 10-year period to 1660

A military capacity was required for the (also unsuccessful) attempts to intercept the Spanish silver fleet from Mexico to the Philippines. At the end of the period studied the tensions around Taiwan were increasing and military reinforcements in the shape of heavily armed war yachts were required. On a political level, the favourable position of the VOC in Japan above the other European competitors came at the cost of restrictions on their visits. The Japanese authorities set the conditions of trade but they also tried to minimise the threat of the VOC ships. It was a common rule to remove the rudder of the vessels arriving at the trade post Deshima in Nagasaki. The restrictions practised by the Japanese and their effects on the VOC vessels can be learned from an incident in 1657 on the arrival of the yacht *Hercules*. In the 1650s, as a result of the first Anglo-Dutch war, the VOC was left with a surplus of big war yachts in their Asian fleet. These ships were constructed at the cost of the flutes that were the ideal traders for this region and did not raise the suspicion of the Japanese authorities because of their light armaments. After the conflict was over these war yachts had to serve as regular trading vessels. When the *Hercules* (ID:939) arrived in Japan the local authorities felt uncomfortable with this clearly well armed yacht and referred to the VOC's obligation to send unarmed vessels (NA 1.04.21, Factory Japan 69, fol. 46).

Mainly trading items for the Japanese market and supplies for the post at Taiwan were collected from Thailand, Cambodia and Vietnam. There was a direct route between Thailand and

Batavia for the collection of supplies for the VOC headquarters. This route did not call for the use of a particular vessel type or require specific vessel features.

Enough bulk goods like sugar and silk were available from Taiwan to justify the use of big ships for this trade, but the shallowness of the harbour entrance meant that they had to be loaded at the Pescadores. Flutes were suitable as carriers since military confrontations were not expected.

Copper, precious metals and some luxury items were shipped from Japan. The copper could stay in the ships for shipping to other parts of Asia but part of the cargo of precious metals had to be unloaded in Taiwan to purchase silk and part was shipped on to Batavia or, following 1638, directly to the Coromandel Coast and Surat. Flutes and bigger yachts were suitable for this purpose.

Smaller vessels were needed to facilitate the distribution of cargo. The smaller flutes turned out to be ideal for that purpose. The VOC's voyages to and from Taiwan were highly monsoon-dependent. The loading took place in a short period between August and December. The small flutes stayed near Taiwan during the season, with an occasional short trip to Japan and back and sailed back to Batavia in the off-season. It was sometimes difficult for the vessels that had to wait for the auctions in Japan in October/November to reach Batavia in time for the departure of the return fleet at the end of December or early January. Fast sailing vessels were appropriate for this purpose.

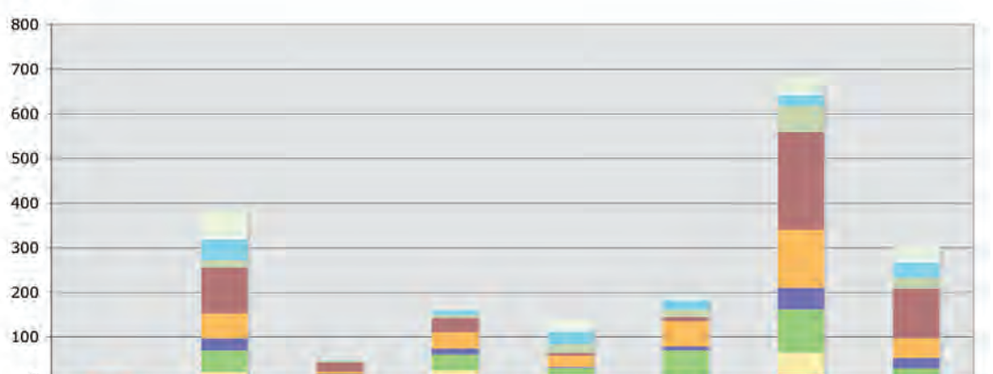
Table 9.10 shows that after the VOC gave up its aspirations towards China, the military needs were lifted to a large extent and they were able to differentiate their fleet in this region. Up to 1630 there was a clear emphasis on military and bigger vessels. This changed dramatically after the establishment of the VOC stronghold in Taiwan with a fleet focused on trade. Apart from the sporadic military confrontations and the military vessels heading for the Philippines, the Far East was suited to dedicated cargo carriers. This general image should be nuanced a bit, especially for the transition period in the 1620s when some developments took place at the level of the separate destinations. For the military operations, Japan was the pre-eminent base for the bigger vessels to capture the big junks sailing between China and the Philippines, until the Japanese authorities became more restrictive about the kind of vessels that were allowed to visit their harbours. Closer to the Chinese coast most of the smaller or middle-sized yachts were employed. Note also the almost complete absence of the flute, which vessel type could not play a role in the military action in China and the Philippines. As is the case with the smaller vessels in the Strait of Malaccathe smaller vessels needed as utility vessels around Taiwan, i.e. the vessels that brought cargo from Taiwan to the waiting fleet at the Pescadores, are not revealed in the statistics since they rarely left the region.

The heavy sea conditions required strongly built new ships. The possibility of typhoons was the pre-eminent threat, and no ship was able to withstand those conditions. The most suitable combination of vessels was big flutes and *retourschepen* as trade ships together with smaller flutes and other small vessels to facilitate the loading and unloading of cargo near Taiwan. *Retourschepen* often sailed on the Batavia and Thailand route. In Table 9-11 the important role of this rate 10 vessels in the shipping to Thailand becomes clear. The newer *retourschepen* could also sail direct or via Thailand to Japan. In Thailand there was usually enough cargo of products for the Japanese market in combination with food supplies and building materials for Taiwan, for these bigger ships. On the return trip these ships often called at Thailand again to load supplies for Batavia. The need for these supplies depended on the political situation in Java. A stopover in Taiwan was often inevitable for the redistribution of cargo for the various destinations: China, vietnam, Batavia and later also the direct connection with the Arabian Sea and the Bay of Bengal. The central role of Taiwan in this region becomes obvious in Table 9-15 where it is shown to be by far the busiest destination. It was a shipping junction with the specific need for smaller vessels and the medium sized flutes (rate 4) in order to be able to serve as a point of transhipment.

It was also possible for *retourschepen* to combine a trip to Taiwan with a return trip to Europe. With a departure from Batavia in August at the latest the ship could be in the region around Taiwan in September. As was the case with the collecting of a pepper cargo from southeast Sumatra, the ships could take on a good shipment of sugar; however, loading took a month

due to the complexity of the logistics between Taiwan and the Pescadores where the big ships had to anchor. If these *retourschepen* were not affected by the typhoon season they could make it back to Batavia before the end of the year to load the remaining cargo and leave for Europe.

The high rate of flutes to Cambodia in Table 9-11 can be explained by the unique situation on the Mekong River where vessels had to be dragged manually far up stream by their anchors. This situation has been described as very arduous and almost inhumane for the crew who had to handle the heavy anchors in the heat of the sun: 'and when at night the time had come to get some rest it was impossible because of the mosquitoes that were in such large quantities that one doesn't know where to turn' (NA 1.04.02, VOC 1252, fol. 116, 127). Damaged *rinckelwerck* or not, it must have been more efficient for the VOC to use flutes rather than the yachts because they had a better cargo capacity for the same effort. A complication was still the danger of hostilities on the Mekong River that required the protection of the vessel, crew and cargo. The VOC probably did develop a more heavily armed flute. This more defensible flute type is recorded on one occasion in the Arabian Sea when, against all odds, the flute *Noortster* (ID:633) was escorting a yacht. This flute then had a crew of 70 and was armed with 30 canons (Colenbrander 1902, p. 203). In the database more of these types of defensible flutes have been found: *Vliegend Hert* (ID 650), 24 canons, *Zon* (ID:621) 22 canons, *Koning David* (ID:780) and *Trouw* (ID:811) 20 canons.



	92	93	94	95	96	97	98	99
10		56	1	1	9	1	33	18
9		10		2	18	6	7	16
8	1	46	2	11	28	21	24	34
7		17	4	6	19	16	59	25
6		103	21	32	7	10	218	111
5	3	56	5	37	25	56	131	44
4		27	5	13	2	9	48	23
3		49	6	36	16	57	97	23
2		8	2	14	11	6	50	5
1	4	9	2	8	3	7	14	2
0		4	2	3	1		1	

Table 9.11: Activity levels of the various types of VOC vessels in the separate destinations in the region of the Far East. 1595-1660 (areas in the first row of the table: 92.Sarawak, 93.Gulf of Thailand, 94. Cambodia and lower Mekong delta, 95.Vietnam, north from Mekong Delta, 96.Sulu Sea, 97. Coastal China, 98. Taiwan and adjacent islands, 99. Japan and Korea)

10

Conclusions

Focus on the Dutch shipping network in Asia

This study focussed on the logistical and technical accomplishments that made Dutch development of trade and shipping in Asia possible. Pivotal area of this research was the shipping in Asia. It aims in that sense to be an extension and in some respects a counter point to the prevalent view of VOC shipping that is based on the monumental volume, Dutch-Asiatic Shipping by Bruijn, Gaastra and Schöffer (1979-1987). Whose research focused mainly on one aspect of the shipping network: the route between Europe and Asia, the so-called *Retourvaart* (homeward bound shipping). By analysing the development of VOC ships in service in Asia up to 1660, this research aimed to highlight the interesting and complex world behind the better-known *Retourvaart*. Through this study information has been unearthed revealing the ways in which the VOC developed and managed its complex shipping network; and conclusions drawn regarding and the processes by which the VOC gained experience and adjusted its fleet to meet the multiple requirements linked with trade, military-political activities and the maintenance of a network of trading posts and strongholds in Asia.

The central research question was: to what extent did the fleet of the VOC and the organisation of shipping contribute to the political and economical success of the VOC organisation in their expansion into Asia during the 17th Century. To determine this a supplementary question is posed: how successful was the VOC in adjusting their fleet to the demands of both the overall organisation and unfolding events in order to conduct their Asiatic operations? The suitability of a ship for any given function depended on the correct combinations of a complex array of features. In order to interpret the full development of the fleet, an understanding of the complete range of functions possible for any VOC ship is essential. By identifying the specific combinations of requirements and linking these to the logistical elements of the shipping, the problems the VOC management encountered in adapting ships for their purposes can be understood.

Knowledge and understanding of the context (historical, political, climatic, financial etc) is important to interpret information and draw valid conclusions. To understand the whole of the shipping detailed information was gathered about the ships and ship types that were in service and their areas of operation. Bruijn, Gaastra and Schöffer (1979-1987) provided the initial information, details on every ship that sailed for the VOC between Europe and Asia. However, the expansion of shipping within Asia itself was of crucial importance to the changes that took place in this period. Therefore, the work of those authors was extended in order to reconstruct all shipping activities of the VOC. A database was created to analyse the development of a differentiated shipping organisation for various routes and destinations. Through a systematic study of the VOC fleet and their voyages in Asia there is now precise and detailed information available on the expansion of the VOC to 1660, in the Asian trade and shipping network. Investigation into the logistical aspects of this expansion created a better understanding of both the obstacles the VOC faced and the opportunities they were offered. The establishment of regular shipping within Asia and the development of a VOC fleet provides a good example of the methodologies of the directors of the VOC, how they searched for the both the best way to organise VOC activities and the most suitable ships.

Trade was the purpose, but the ships were the means and the organisation was the oil that kept the engine going. Experience (and experiments) led to changes in the shipping organisation, the design of ships and the composition of the fleet.

The Dutch shipping in Asia to 1660

The extent of Dutch shipping in Asia could be derived from analysing from historical records both the ships in service in Asia and their voyages in the intra-Asian network. A single comparison of shipping between Europe and Asia and Dutch intra-Asian shipping clearly demonstrates the importance of this lesser recognised aspect of shipping history.

Between 1595 and 1660, 1,368 voyages of shipping between Europe and Asia were recorded, while in the same period 11,507 voyages in the intra-Asian network were recorded. It must be borne in mind, however, when making any comparison the differences in nature between the long inter-continental voyages and the shorter routes of the network in Asia.

Period	Europe-Asia	intra-Asia
<1610	221	606
1610<1620	158	1055
1620<1630	218	1920
1630<1640	209	2365
1640<1650	270	2804
1650<1660	292	2757
TOTAL	1368	11 507

Table 10.1: Comparison of frequency of Europe-Asia and intra-Asia shipping (number of voyages between destinations)

The development of intra-Asian shipping in both frequency and volume is an interesting indicator of the overall VOC expansion in this region.

From 1610 until 1630 the frequency shows a rapid growth, consistent with the initial developmental phase. Up to 1610, first the *Voorcompagnieën* and then (during its early years) the VOC operated mainly trading-round-tours that would bring most ships back to Europe. After 1610 the establishment of a permanent organisation in Asia and the build-up of a fleet by the VOC in Asia is reflected in the growth of the shipping to various destinations. After the establishment of Batavia in 1619 the expansion continued and was tempered only slightly by the VOC's experiments in the early 1620's in privatising parts of the intra-Asian shipping. This foray is hardly visible in the 10 year figures as this policy was short-lived and half-hearted and was overshadowed by the overall expansion.

In the 1620's the VOC network developed and the routes were consolidated and fine-tuned. From 1630 until 1650 there is steady growth: the existing network is further developed and intensified. In the period 1650-1660 the intensity of the total shipping decreases by 2%. If the volume of shipping is considered, the growth is not as consistent. The total volume of the shipping increases up to 1650 but the rate of growth between 1630-1639 is much lower. From 1640-1649 there was a boom in growth with an increase close to 50% in volume. The volume stabilised between 1650-1659 with an 8% decrease in volume.

With the compilation of all the data from historical records in to a database it is possible for the first time to analyse the development of VOC shipping in Asia quantitatively. Data on shipping to the various regions provides a background to the development of an Intra-Asian network. Data was collated into ten-year periods from 1610 to 1660, Data prior to 1610 was collated in an additional category[76]. Analysis was then carried out the data in these six distinct time periods. The frequency of arrivals and ships' tonnages in the main trading areas was evaluated. The results of the analysis show an ongoing development in trade, but in addition these results highlight the VOC's military strategies.

Period	Frequency	%Growth	Volume	%Growth
<1610	606	-	249768	-
1610<1620	1055	75	401890	61
1620<1630	1920	82	593786	48
1630<1640	2365	23	691860	17
1640<1650	2804	19	1018674	47
1650<1660	2757	-2	941072	- 8

Table 10.2: Development of the Intra-Asian shipping – frequency and volume (tonnage in lasten)

At a regional level the development of the trade on the major routes is clearly visible. Aside from the centre of the activities on West Java, the Spice Islands were important destination over the entire period as the supply of core products for the VOC. In order to purchase the textile that served as the currency for spices and pepper the VOC had to develop shipping on the Coromandel Coast and the Bay of Bengal. From the 1610's the VOC also aimed to set up their own pepper trade on Sumatra; to become independent from the traditional sources like Atjeh and Bantam. With the availability of Malabar pepper shipping to Sumatra declined after 1650. In the Far East in the 1620's attempts to access the Chinese market failed, the VOC found an alternative in a stronghold on Taiwan. In the 1630's the Dutch obtained a beneficial position in Japan, which lead to an intense circuit of shipping from Batavia via Thailand to the Far East. With the decline of the Portuguese power in the Bay of Bengal the VOC almost reluctantly reinforced their position in this region to prevent others from filling the vacuum. This gave rise to more intense shipping to this area from the 1630's. From that period on the VOC also intensified their shipping to the Arabian Sea.

Around 1630 when the VOC intensified its attempts to ban Portuguese shipping through the Strait of Malacca (the important connection between the Indian Ocean and the Far East), they sent smaller, well-armed yachts to this region. After the VOC captured Malacca from the Portuguese they were able to connect the traditional Arabian trade route from the west with the Chinese trade route from the east. The VOC was the first to link these two routes and create their own direct shipping system.

The efficient Dutch system

In the search for the most efficient shipping organisation that met the circumstances within Asia, flexibility became an important characteristic for the VOC. Firstly, flexibility allowed the VOC to manage the difficulties of the physical conditions of the region. Traditionally, the monsoon seasons dictated shipping activities, this meant that shipping, would come to a halt and sometimes for months on end. The VOC's European competitors in Asia were essentially limited by the monsoon season in the same ways: the Portuguese, as they relied predominantly on Asian shipping for their local trade; and the English, because they focussed on direct trade between Europe and Asia. The VOC, however, looked for ways to overcome this limitation and designed a shipping network that ensured an efficient use of the ships, to various destinations, the year round.

The flexible opportunistic approach applied by the Dutch is revealed by a detailed study of the shipping routes and the ships that operated on these routes. The result is an elaborate structure of shipping and trade connections that allowed the VOC to keep trade circulating continuously. The ship *Avondster* (ID:871) serves as a good example of this system. The ship arrived in Batavia from Europe in 1655 and left for the Spice Islands on the western monsoon winds in December. In March 1656 the *Avondster* returned to Batavia on the eastern monsoon. In July the season was right for a trip to Japan from whence a return trip could be undertaken in November. After the *Avondster* proved to be unfit for a return voyage, the VOC organisation was flexible enough to use the yacht first to patrol the Java coast and after that to engage in a military campaign on the coasts of India, where it reverted to being a freighter again. The developing

complexity of the trade and shipping network between these regions illustrates the flexibility of the VOC in utilising their ships to the fullest extent and keeping them sailing, in contrast to the Portuguese who often left ships idle waiting for a change of season.

Optimising the use of the different ships within the Asian shipping network was in itself a difficult task. Connecting the supply of cargo from various regions to the Europe-Asia shipping network made the task even more complex. The development of the shipping and trade network is outlined in Chapter 4. The logistical organisation required to link the intercontinental and the intra-Asian shipping was incredibly complex and the prescript timeframe for the departure of the homeward bounders to Europe contributed to bottlenecks in Batavia. In order to be in the Netherlands at a convenient time before the winter and avoiding the Asian monsoon season, shipping would have to occur in a timely manner within tight timeframes. By working out a scheme in which the VOC made optimum use of a variation of vessel types most of these problems could be overcome. Also on a local level, as for instance, in Taiwan, where the transhipment of the Chinese and Japanese products required small vessels only for a short period in the year, the VOC optimised their operation by sending specific vessels to the region for this purpose, but employed for other purposes during the off season.

A VOC fleet for Asia

To what extent was the VOC fleet differentiated?

Analysis of the composition of the VOC fleet in Asia allowed conclusions to be drawn regarding the level of differentiation within the fleet. In the period 1610-1660 the VOC network was in a state of constant development and modification. After the initial stage, when fleets were sent to Asia and sailed back to the Netherlands after collecting Asian goods, the VOC successfully set up their own shipping network in Asia. This endeavour required a greater and greater differentiation of the fleet. The role of the various vessel-types in this process is clear from the analysis of fleet composition.

The first clear step towards differentiation took place after 1610 when the *Retourschip* (rate 10), appeared as a specialised vessel. The *Retourschip* was initially introduced as a new name for the existing big ships of rate 8 that were serving as *de facto Retourschepen* (homeward-bounders), but it was not long before this rate became a subject of intense debate at VOC directors' meetings and an important component in the VOC shipbuilding program. From this time onwards, a steady growth in the numbers of this type of vessel can be seen. *Retourschepen* were robust and under normal circumstances could last for at least twenty years, that is providing no disasters befell the ship and it was regularly maintained. *Retourschepen* were mainly employed on the route between Europe and Java, the connection point where the Asian shipping network assembled the Asian merchandise. Later in their career these ships would serve in Asia if they were no longer fit to make the intercontinental journey to Europe. In Asia they could be employed as cargo carriers or, on an incidental basis, as well-armed ships for military operations. In that respect they took over the role of the men-of-war (rate 9) that were especially active in Asia in the early period of the Dutch presence in Asian waters. In this early period the VOC sailed to Portuguese strongholds with a large offensive fleet. With a truce in 1609 this strategy changed to more specific offensive actions where the direct interests of the VOC could be proved. So instead of Mozambique and Goa the men-of-war were employed in the regions around the Spice Islands, the Philippines and in 1615 in the Strait of Malacca. The rate 9 men-of-war that came into service shortly before 1620 were explicitly meant to fight the English. When the English became allies of the Dutch, these ships were employed instead in an Anglo-Dutch 'fleet of defence' against the Iberian enemy in the region of the Spice Islands, the south China Sea, and the Persian Gulf. The partnership between the VOC and the English was not very enduring or successful. The coalition broke up in the early 1620's. After 1630 the role of the big men-of-war in the VOC fleet was also reduced as the early Dutch State subsidy for the efforts of the VOC against the Portuguese no longer took the form of Admiralty vessels. For

their military capacity the VOC then relied on the yachts as armed merchant vessels with some 'war features'; well-armed smaller vessels and occasionally the *Retourschepen.* Gradually the VOC's strategy also changed to a policy in which the Portuguese activities were disrupted by well-armed cargo carriers assisted by smaller types of vessels like the *fregat* in rate 3. The numbers of *fregatten* in rate 3 grew rapidly between 1620 and 1630, during this period they played an important role in the establishment of the VOC positions in various regions. Many of these vessels were captured from the Portuguese.

An important element in the development of a differentiated VOC shipping network in Asia was the search for the most suitable vessel to maximise commercial activities in combination with a military capacity when required. If the balance of power allowed it, the VOC could employ pure merchant vessels on certain routes. The best indicator of this process is the introduction of the flute as the cargo carrier. Their introduction into Asian waters was discussed in the early 1610s. On an experimental scale various types, such as the flute-like *gaing Galiase* (ID:173) in 1615, were sent to Asia and tested. Due to the tense circumstances still present in the whole VOC trade area, but also mainly because of the organisational experiment with outsourcing most of the intra-Asian shipping in the early 1620s, the VOC did not use many flutes until 1626. From this year flutes were sent to Asia on a regular basis. The various types of flutes (rates 4 and 6) became an enormous success as was the case in Europe. After 1630 the medium sized and big flutes became the most popular VOC cargo-carriers to destinations where heavy protection was not required. The number of flutes diminished around 1650, when, under the threat of renewed confrontations with the English and the Portuguese, war-yachts were purchased and dispatched to Asia. Soon after the Dutch-Anglo war ended, flutes were once again sent to Asia and the trading component in the VOC fleet grew yet again.

As discussed previously the success of the yacht in the VOC fleet in Asia was based on a combination of features. Often these yachts were true multi-purpose vessels, transporting substantial amounts of cargo but also displaying sufficient battle strength when required. Depending on the actual situation in Asia, and the availability of these vessels in Europe, the balance between merchant and military features was subject to change. As was the case with the 'war-yachts' of the 1650s, the scale tipped to military features at the cost of cargo capacity. In other instances, like the *Avondster*, captured in the 1650s, the vessels were more suitable for trading activities. After 1640, yachts played an important role in the renewed ambition of the VOC to attack the Portuguese in their strongholds. Since these actions were proactive strikes by the VOC they were able to maximise use of the best available vessels.

Relating to the growth of the trade and shipping network, another issue emerges clearly from the analysis, the need for smaller vessels that could be used to support the operations of the VOC. These vessels (rates 1 and 2) were employed at all the various types of locations where the VOC was established. Both these rates show a steady growth that mirrors the general growth of VOC activities in Asia. An interesting development was the trend towards replacement of the Dutch prefabricated vessels with Asian-built vessels after the 1630s. This is highly significant as it demonstrates the extent of VOC shipbuilding in Asia. Unlike the Portuguese the Dutch failed to set up a successful shipbuilding programme for bigger vessels. The VOC directors in the Netherlands felt the need to control this important economic aspect for their various Chambers. A significant benefit of the shipbuilding program in Asia was that smaller vessels no longer needed to be strong enough to sail from Europe or small enough to be shipped on board a *retourschip*. In fact after 1640 no more prefabricated vessels were shipped to Asia.

Input of new vessels into the fleet

The availability of suitable ships was of prime importance for the capacity of the VOC. From the early 17th century onwards, the VOC had its own shipbuilding facilities in the Netherlands. It is generally believed that the VOC primarily built its own ships. However, besides controlling the construction of its own ships, the VOC also purchased ships for modification in their own shipyards. The directors would decide on the shipbuilding programme at an annual meet-

ing, but could react quickly to changes in circumstances by acquiring directly from the large Dutch ship market. Decisions were based on the advice and recommendations received from VOC officials in Asia, the skippers and the shipbuilders.

Although the VOC controlled its own shipyards, the shipbuilding procedures were the same as for the private shipbuilding sectors, where the design of a ship was based on a consensus between the owner, the user and the builder. The outcome, the various requirements and possibilities, was laid down in a charter that listed the main features of the ship. Ultimately, the construction and design of a ship was a practical skill, as theoretical shipbuilding with technical drawings was not practised at the time. The shipbuilder was responsible for the end result, that it met the wishes and the requirements of the user; but the shipbuilding methods in practice in the Netherlands allowed the relevant parties to implement changes during the building process, a flexibility that ensured the success and fame of Dutch shipbuilders in the early 17th Century.

The shipping conditions and cargoes in Asia were at least as diverse as those in Europe. In addition, military confrontations created by the competition with European and Asian traders, required ships that could be used for warfare, patrols and blockades as well as for trade. The ships that were fit to serve in a 'merchant fleet' were not necessarily fit to meet all these requirements. Through experience, the requirement for certain ship types became evident. From the extensive correspondence between the management in Asia and the VOC directors in the Netherlands, these changing requirements can be understood. These recommendations and requests were often points of discussion and disagreement with the Directors of the VOC in the Netherlands. The great distance between operations in Asia and the decision-makers in the Netherlands, initially led to unproductive policies as did the decentralised structure of the VOC where changes in the organisation often led to long debates exacerbated by conflicting interests and opinions between the Directors of the different Chambers. Thus a request by the Director Coen in 1614 (Colenbrander 1919, p.106) to send flutes to Asia was only granted eight years later in 1622 (NA 1.04.02, VOC 100, fol. 588). The VOC eventually succeeded in building up an efficient organisation with a differentiated fleet consisting of ships for the intercontinental route, for the intra-Asiatic trade, for military tasks, and vessels for supporting tasks.

This process of differentiation required in the first place a good understanding of the requirements for a suitable vessel. In this study numerous examples of the discussions between the management in Asia and the VOC directors in the Netherlands regarding the composition of the VOC fleet are examined. The decision makers needed access to shipbuilders and facilities, to translate these demands into new designs or modifications of existing vessels. The VOC also had access to a market of used vessels or 'casco-built' hulls that could be modified for specific purposes It was not an easy task to combine the specific requirements and then decide which type of vessel would be suitable and what fleet composition would best meet the prevailing needs, especially as shipbuilding was far from standardised at this time. As the 17th Century author of a shipbuilding handbook, Nicolaes Witsen, stated: 'no ship, like no human being, is the same as another' (Witsen 1671, p. 53). Shipbuilding underwent a very dynamic period from the late 16th Century. In almost every sector of maritime activity, changes were taking place in the scale and design of vessels. The flute has been mentioned as an important type of vessel for the merchant fleet, but the Dutch Admiralties were also searching for the most suitable vessels for their changing activities and organisation. In general one can see the tensions caused by the push toward standardisation and the struggle to put these ideals into practice and control the shipbuilding process (Elias 1933). Although the VOC tried to rationalise the composition of their fleet by formulating a strict shipbuilding programme, in practice they were forced to improvise, primarily because the Dutch shipbuilding system did not, in the main, require vessels to be built from a construction drawing but simply from a specification of basic dimensions: the so called 'charter'. Although one can observe a growing trend toward the development of the theory of ship construction at that time, including in the Netherlands[77], in practice shipbuilding was based on the input of the shipbuilder interpreting the charter (Waard 1942; Stevin 1605).

Often decision makers did nothing more than formulate their wishes for a certain design by referring to an existing ship and then indicating how the new vessel should differ from that one: 'but a bit longer, stronger or with an extra deck'. As a logical consequence the shipbuilders

of the various VOC Chambers often also took liberties in the interpretation of the building charter that contained the main dimensions of the vessel and was intended to control the agreed division of cargo capacity between the chambers. The building and equipping of ships meant economic activity for the town so it is understandable that for many reasons it was tempting for the shipbuilder and local managers to push the boundaries. It is ironic that such an important element, shipbuilding, became subject to a game of cat and mouse between the Chambers and the *Heren XVII*, a game with a lot at stake. The VOC directors tried just about everything to keep the Chambers and their shipbuilders under control. They had to pledge to follow instructions; inspections and missions from other chambers were organised and penalties became heavier over time. In 1626 a fine was set and in 1631 the responsible shipbuilder had to put his hand on the written charter in order to declare solemnly that he would follow the instructions. The ultimate sanction then was that he would be removed from office. Directors were held personally responsible for all financial damage caused to the Company by the building of vessels that were too large (Stapel 1927, p. 464).

Regardless of these apparent limitations, Dutch shipbuilding became famous for adapting the design of vessels to changing requirements. During the studied period the VOC experimented fully with the size and design of the vessels. The design of the *Retourschepen* in particular was almost constantly subject to small changes. It was only at the end of the 17th century that a serious attempt was made by the VOC to standardise their fleet. The performance of a specific vessel in relation to various features was often the subject of discussion with decisions to change the design resulting. It is however interesting that a number of ships criticised for their bad design were kept in service for many years.

The VOC directors wanted an extensive fleet of VOC owned vessels in Asia for two important reasons relating to their general policy. The first factor was that the VOC strove for a monopoly over trade in a number of Asian products and did not leave transport in the hands of private local transporters. The second factor was the aim to finance the costs of acquiring products for the European market by intra-Asian trade. A substantial part of this fleet originated from the Netherlands, however due to the means of acquiring vessels in Asia – including an active policy of capturing – many, mostly smaller ship types, came from another shipbuilding tradition. Small vessels were built by and for the VOC in many places in Asia. Judging from type-names these smaller vessels were of both European as well as local design.

Unlike their Iberian competitors the VOC directors had a policy of homeland construction for most of the larger ships in their Asian fleet. This policy was partly based on practical considerations such as the problems the VOC experienced in finding good shipbuilding materials and ships' carpenters in Asia. An important factor however was that the *Bewindhebbers* (local Directors) of the Chambers wanted to control the shipbuilding themselves and keep the revenues of building and equipping ships in their own companies and cities in the Netherlands. The ostensible reasons were their fear of exporting successful Dutch shipbuilding techniques abroad and the higher costs of shipbuilding in Asia – but this may simply have been a rationalisation of their wish to keep profits in the Netherlands.

From a contemporary European perspective Asian shipbuilding techniques were considered to be of a poor standard. The military power of the ships was important and in this area most Asian ship-types were inferior to the European. Although there are examples where local rulers tried to build European ship-types, the VOC officials in Asia were not primarily concerned about the transfer of knowledge but more about the capacity of their craftsmen, the materials required and ultimately also their trade competitors. In the year 1651 a yacht of around 150 *last* was built for the King of Siam: '[in] the Dutch manner, very strong and designed to carry 20 canons'. Van Goens was indignant about this development and advised that this should never be allowed. 'The use of our excellent shipwright is already unacceptable but they would certainly also get hold of our equipment and eventually try to send off these ships with our navigating officers to Japan'. (NA 1.04.02, VOC 1275, fol. 349v).

Building ships in Asia for the VOC fleet was considered. In 1651 it was suggested by Batavia that if vessels of 60 to 100 *last* were constructed in Japara and Siam, the VOC would not need to send this type of vessel from the Netherlands, which would result in substantial savings (Coolhaas 1964, p. 481). The VOC directors in the Netherlands believed that, on the contrary, the cost

of Asian production would be much higher if a realistic calculation was made of the expenses for the transport of the materials and the fee of the Dutch craftsmen working on these projects. Documents from later in the 17th Century spell out the advantages to the Netherlands local economy of retaining shipbuilding rights '[…] that it gives work to many people, that the money needed for the construction of such vessels is kept here in the country, rather than sending it with many costs and dangers to India' (Stapel 1927, p. 453).

Weaving it all into a efficient maritime network

The VOC succeeded in setting up an efficient shipping organisation that allowed them to optimise the use of their fleet. In contrast with the European competitors and many local traders the VOC designed a system of sailing routes that would make them as independent from the monsoon as possible. Aiming for a flexible system the VOC build an elaborate network of shipping and trade connections that allowed them to keep trade circulating continuously. Consequently two shipping systems were developed: European-Asian shipping and Intra-Asian shipping. Both systems met in the central VOC headquarters Batavia on West-Java. The foundation for this system had been set prior to 1620. An initial base centred around a fleet of ships sent to Asia for a trading-round-tour with some additional (exploration and military) tasks, a permanent organisation was then established on West-Java, with the headquarters at Batavia from 1619. The development of these two shipping systems and the timely convergence at a central rendezvous is a clear example of the complexity of the VOC organisation with its strong ability to adapt to changing circumstances also limited by its specific character. It shows the interdependence of a suitable fleet and an efficient logistical organisation. The two shipping networks were of major influence on each other. As explained in Chapter 6 the requirements of the *Retourvloot* had a profound impact on the Intra-Asian network. This is evident in the shipping times, where cargo was expected to arrive in Batavia in good time for the return voyage to the Netherlands or in the organisational set-up where the *Retourschepen* being already partly loaded with bulky cargo items at important destinations in the Asian shipping network before they sailed back via Batavia could also load the smaller quantities of expensive cargo items. On the other hand the moment of the arrival of money and men from Europe in Batavia was decisive on the possibilities of commercial and military actions in Asia.

This study revealed a high degree of differentiation within the VOC fleet in Asia. In Chapter 10 'fleet to regions' it is shown that the differentiation of the VOC fleet was even greater at a regional level. Through their finely woven organisation the VOC were able to maintain specialist vessels for certain purposes even on a local level. In addition they were also able, as indicated in the yearly *Navale Macht*, to assess the quality of a certain vessel and find suitable employment during all the stages of its career.

Probably the biggest advantage that this system had to offer was the ability to circumvent the traditional monsoon trade in Asia. The centralised organisation from Batavia allowed the VOC overview of the deployment of the fleet on various routes and the ability to plan Intra-Asian trade activities (and the availability of the associated trade capital). They could therefore avoid longer periods of vessels, staff and trade capital being idle waiting for a changing monsoon season this period of idleness characterised traditional monsoon trade and shipping. Through the availability of vessels of various dimensions the VOC was able to react efficiently to fluctuations in the requested or available cargo. The central control from Batavia could have contributed, with the right policy, to the commercial success of the VOC on the Intra-Asian market in the 17th century.

Central control at strategic locations and routes came with a price and required a permanent military presence. The general opinion was that the monopoly on the purchasing of some products (mainly spices) and prevention of other European traders shipping products to Europe would eventually compensate the expenses. In the short term the value of the cargo of some captured Iberian vessels rarely covered the expenses of the military operation and the delay or abortion of trade-missions. Only on some occasions, especially in the early period when the Portuguese were still using huge trade vessels, was the booty very large. Preventing the trade

between China and the Iberian settlements by confiscating some Chinese junks could be profitable. Although the overall balance is difficult to measure, it is clear that through the availability of a differentiated fleet with vessels that combined military power with a reasonable cargo capacity, the VOC was able to combine an offensive mission with trade activities and so reduce the expenses. For instance the vessels from the Goa blockade could ship pepper from the Malabar Coast and cinnamon from Ceylon on their way back to Batavia.

An interesting aspect of this policy was the way in which the VOC could acquire the necessary vessels for their centralised Asian organisation. The decentralised structures in the Netherlands, of Chambers with often local interests, was basically the cause of a persistent policy to build and purchase the vessels of the Asian fleet in the Netherlands. Even some of the smallest vessels that were used by the VOC in Asia were from the Netherlands. The building of vessels in Asia by the VOC was marginal and for the bigger ships almost non-existent. However decentralised shipbuilding and an active policy of purchasing vessels from the ship market in the Netherlands allowed a swift response to the arising needs for certain types of vessels.

The tension between the European and Asian organisational set-up was also tangible in the sending of the cargo to Europe. The management in Batavia was in principal bound to the orders they received from the Netherlands for the return cargo. However to a certain extent VOC Batavia was able influence policy by the implementation of the return shipping. Often they deviated from the orders using unforeseen circumstances as an acceptable excuse (Coolhaas 1960, p. 455; Colenbrander 1923, p. 857).

Obsessively the organisation in Batavia tried to meet the prescribed division of cargo for the various Chambers. They sometimes blamed the Netherlands organisation for not sending a fleet of *Retourschepen* that would allow then to make the division of cargo over the various Chambers (Coolhaas 1960, p. 281). An extra complication for VOC Batavia was that the homeward-bounders did not have standardised dimensions (NA 1.04.02, VOC 677, 01-09-1656).

The internal structure of the VOC with its strict division of activities between the various chambers was often a burden for the organisation. The authorities in Batavia must have grown grey hairs in order to meet the requirement of proportional division of the cargo for the various chambers in the Netherlands. It would be interesting to examine in depth how the *'egalisatie'* driven organisation from the Netherlands sat with the establishment of the VOC in Asia, which had another mission and was only confronted with the consequences of this policy through the ships that were granted for the Asian fleet, the restrictions in developing their own ship building programme and of course the complex division of the return cargo. Illustrative of the complexity and mistrust of the situation is an order from the *Heren XVII* in 1621 to Batavia to strictly follow the instructions by their college and pay no attention to possible private requests by the individual chambers 'niettegenstaende eenich particulier schrijven contrarieerende met gemelte resolutie van de Seventien' (Colenbrander 1922, 24-10-1621).

Dutch spirit of commerce?

One of the assets of the intricate structure of the VOC shipping network in Asia was the possibility for fast communication. The extensive correspondence between this network of trading posts, the central rendezvous Batavia and the directors in the Netherlands allowed the VOC to have access to accurate and detailed information. In the disciplined exchanged administration and letters a wide range of subjects was covered. For commerce it was of major importance to have knowledge of profitable products, current prices and the available shipping capacity. It was possible for the VOC management to send detailed instructions and evaluate the results of a policy: those disobedient but with fortunate alterations to the instructions were praised whilst the less creative, strict followers of instructions with consequently poor results were reprimanded. This type of communication occurred between Batavia and the VOC and associated trade posts in the region.

Through this extensive source the impression arises that, regardless of the many cases of private trade, the working culture within the VOC in Asia was clearly aimed at cooperation for the benefit of the *Loffelijke Compagnie* (Laudable Company).

One could argue that what has been called the *Hollandse Handelsgeest* (Dutch spirit of commerce) often used as a 'mythical' explanation for the Dutch success, is mainly based on the access to information. Through this information commercial success was possible. Profits in the intra-Asian network could be made because of the insight and overview of VOC employees in the network. They knew how to utilise the available capital most efficiently, where shipping capacity was available to send the products for a timely and safe arrival at another location; and where it could be used as multiplier of commercial success. The structured way in which this information was exchanged at all levels of the organisation and to the far-off corners of the network must have given the VOC an advantage over their competitors.

Notes

1. The author is indebted to Menno Leenstra for his assistance and determination to 'collect' ships and trips
2. For instance, the vessel Nieuwicheyt (ID:357, see section 5.6) listed by the VOC as multiple vessel types, i.e. roeychaloup, opgeboeide sloup, chaloup, jacht, adviesjacht.
3. This description applies for this specific study of the shipping in Asia. The whole database also contains destinations, areas and regions outside Asia.
4. In order to follow the ongoing sailing history of a certain vessel, the periods of stay at destinations have also been included as a separate record within the database.
5. Not all the arrival and departure dates were accurately documented in the various VOC records. For instance, there might be information on the departure of a ship but not on its arrival. In such cases, the ship is then still listed in the database for a given journey but a 'true and false' indicator prevents the data polluting research on more detailed issues such as average sailing time between destinations.
6. Initially this distribution formula was based on the building and the equipping of the ships. This would have served the purpose if every ship returned to its specific Chamber. Problems with this system arose when ships returned to other ports or stayed in Asia.
7. The goods also included the capturing of enemy ships sanctioned as a legitimate activity, as in the expeditions of Van Noort and Spilbergen.
8. During the 'tweede schipvaart' 20 men were left behind at Banda and six at Tidore. In 1600 there were 27 men at Ambon. In 1601, some men were left by Pieter Both of the ´Nieuwe Brabantsche Compagnie´. Van Heemskerck left six men behind at Bantam for the ´Oude Compagnie van Verre´. Men were also left behind at other places such as Patani, Atjeh, Surat and Grissee.
9. The decision to replace Reael with Coen had already been taken in the Netherlands in 1617. This news was brought to Java in 1618 but Coen could not inform Reael who was on the Spice Islands until the beginning of 1619. When Coen arrived at the Spice Islands early 1619, then the formal conveyancing took place (Colenbrander 1920, p. 524).
10. For instance all the 3 vessels researched for the Galle Harbour Project -: Avondster (ID:871), the Hercules (ID:939) and the Dolfijn (ID:903) served in this blockade.
11. 1622: (ID:198&276) , 1623: (ID:245) 1624: (ID:219), 1625(ID:186).
12. Hongis were annual inspections in the region. VOC officials landed at various locations to discuss a variety of issues with the local ruler. On this occasion the spices growing wild were destroyed (Jacobs 2000: 22).
13. The VOC could take over a flourishing trade that was earlier organized by Japanese traders. (Tarling 1999, p. 351): 'Between 1600 and 1635 more then 350 Japanese ships went overseas under the Red Seal permit system. They called into approximately nineteen ports, including Vietnam, Cambodia, the islands in the Malay-Indonesian archipelago, and Luzon in the Philippines. A measure of the importance of this Japanese trade was their export of silver. Between 1615 an 1625 an estimated 130,000-160,000 kilograms of silver was sold, amounting to 30-40 per cent of the total world output outside Japan'.
14. Van Goens Sr. was active in various functions in the region from 1653. He was Governor in 1660-1661, 1663 and then again 1664-1675.
15. 'slandts indicates that this was a man-of-war sent out by the Netherlands Admiralty. In 1623 the so-called Nassausche fleet was sent to Asia around South America by the government of the Netherlands.
16. Wrecked near Mauritius in 1615: Banda (ID:91, left Netherlands 1611), Gelderland (ID:73, left Netherlands 1611) and Geunieerde Provintien (ID:81, left Netherlands 1612).
17. De schepen Peerl (ID:842) en princesse Royale (ID:798) voorn- werden bevonden seer swacke periculeuse Schepen te sijn, veroorsaeckt door haer grote lenghte ende ondiepte ofte vlackte, waer doorse

wanneer de Zee een weynigh ongestuijmigh is soodanigh arbeyden ende slingeren dat alles moet bersten Scheuren en breecken watter aen is

18. De Cameel (ID:367), for instance, sent to Asia in 1625, was already called an old ship in 1626 (Colenbrander 1919, p. 198).
19. The ship der Goes (1609, ID:123) was 109 feet with a beam of 31feet. The charter in 1612 for big yachts was 120 by 30 feet. The vessels Groene Leeuw (ID:133) and Sterre (ID:136) purchased by the VOC, were regularly called yachts and measured 104 by 26 and 100 by 28 feet respectively.
20. In making this classification, the first premise was that yachts would be reasonably easy to group according to their 'lastmaat'. Based on the frequency of a certain 'lastmaat' it was hoped to determine the common size of big, medium and small yachts. The reducing frequency from one group to the other was expected to set the limits for a certain category. A complicating factor was that peaks in the frequency of lastmaat were also influenced by the 'political' assignment of a size due to the 'egalisaties' system.
21. Although this was an argument used by the VOC for maintaining the blockade, Van Veen believes that the reason for the drop in exports to Portugal is to be found in the deterioration of the Portuguese shipping organisation (Van Veen 2000; 2003).
22. NA 1.04.21, factory Japan 70, 13-08-1657.
    Vroegh omtrent ses uijren sont den gouverneur quiemonsamma den offona met alle tolcken bij mijn en liet vragen hoe het quam dat in plaets van fluijt scheepen (die voor desen ordinarie plechten in Japan te comen) nu altemael zulcke groote Jachten ende spiegel scheepen herwaerts gesonden wierden, want verleden jaar hadde zijn Ed:t onder de acht scheepen die hier geweest waren, niet mee dan eene fluijt Namentlijck de koninck davidt bevonde, ende soo hij bericht was stont er dit jaar niet een fluijt meer, maar altemael sulcke groote oorloghs Jachten (als hier nu lagen) te verschijnen, waerop deselve antwoorde gaf, om dat de fluijt.scheepen die eenige Jaaren herwaerts in dit vaerwater en tot desen handel waeren gebruijckt geweest, als de witte Valck, 't witte paert, Campen, Hillegaersbergh, de pellecaen, Coningh davidt, en meer andere meest alle afgevaren en van ouderdom vergaen waren, zulcx die geene diemen noch eenigh sints bequaem oordeelde, en in stille vaerwateren konden gebruijckt werden, anders nergens toe en dienden, als om steen en hout tot batavias timmeragien te halen, ende omdat ons dit jaar apparent oock geen nieuwe fluijten uijt nederlant souden zijn toegezonden geweest soo hadde d'Ed=le H=r generael nootsaeckelijck dese jachten (die noch nieuw hecht en sterck waeren om in dit ongestuijmige vaerwater een storm te konnen uijtstan) moeten ordineren herwaerts te zenden met welck bescheijt die quel geesten weder te rugh naar gemelte gouverneur gingen.
23. The yachtsDelft [ID 75, lost in the Moluccas 1610] Enckhuysen (ID 77, lost in Ternate 1607] and Medenblick [ID 80, returned to the Netherlands in 1608].
24. Arend (ID:99), after military actions at Mosambique and Goa visited the Cormandel coast and sailed via the Moluccas to the Philipines where the yacht was lost by fire in a fight against the Spanish in 1610.
    Griffioen (ID:101), after military actions at Mosambique and Goa, took part in the action near Malacca and later made a trip to Patani and Japan. Ended its career in the Moluccas in 1612.
    Pauw (ID:108), operated together with the other yachts, also took part in the action near Malacca, escaped from the fight in the Philippines and was in use in the Moluccas till 1614.
    Valk (ID:112) same career as ID 99, was taken by the Spaniards in the fight in the Philippines.
25. The Supply and Blessing (Rate 7) were captured together, the Blessing was renamed the Avondster and wrecked 6 years later in 1659
26. Bruijn et al (1979-1985; 0067.1 and 0138.2) propose that Der Goes (ID:61) and Der Goes (ID:123) are the same vessel, and that this was the second trip of this yacht to Asia. Der Goes [ID:61] returned to Zeeland four years prior in 1605. From the resolution of the Heren XVII (NA.1.04.02, VOC 100, 09-07-1608) and the list of 'egalisatie van de timmeringe' (NA 1.04.02, VOC 100, 29-03-1609), it is concluded that the Der Goes (ID:123) was newly built. It had the following dimensions: length 109 feet, width 31 feet, and draught 12,5 feet, height of the 'coebrugge' a little less then 5 feet.
27. Amsterdam feet of 0.283 metres.
28. The lastmaat of the der Goes was 180 last according to the charter of building (NA 1.04.02, VOC 100, fol. 50) though it only was registered in the egalisaties as 130 last.
29. Dimensions from primary sources are mentioned following the 17th century units. For length, beam and draught feet are used. Estimated dimensions are in modern units. Since only the lastmaat of the Duyfken is known, the reconstructed length is given in metres.
30. Also named Arrakan.

31. Van Ravesteyn had in zijn remonstrantie reeds gewezen op de uitstekende gelegenheid tot de scheepsbouw, waarvoor in Gandivi het geschikte hout te krijgen was. Van den Broecke maakte hiermee een begin. Kleine vaartuigen, fregatten of fusten, werden in Gandivi en Broach op stapel gezet; van den Broecke vertelt met zekeren trots, hoe het eerste door de Hollanders gebouwde fregat, de Goede Fortuin, groot ongeveer 15 lasten, in februari 1621 uit Gandivi voor de stad Suratte ter reede kwam.
32. Amboyna ende alle de omliggende plaetsen sijn seer wel begaefft met diversche soorte van schoon hout, soo dat men daer van alles soude connen maecken, ja groote ende cleyne schepen,¬ galeijen ende fregatten. Sommige soorte van dit hout can eenige jaren langer int water dueren als 'tgene dat wt Nederlant comt, dat wij alsoo bij experientie hebben bevonden. Onse timmerlieden most 'thout vande Amboynsche timmerlieden eerst leren kennen.
33. The idea that the term yacht in the 17th century applied to fast sailing vessels as compared to the more "clumsy" ships does not always hold true.
34. Vessels of more than 70 last were seldom called frigates. The only one found was the Jager of 80 last, which was "built up from a frigate", (Colenbrander 1922) so may originally have been smaller (Coolhaas 1953, p. 1647). These dimensions show that these Asian frigates were different from the warships used later in Europe with the same type-name, which were much larger.
35. The origin of the Arnhem is unclear. It came into service at Ambon and it seems only to have been used for the discovery voyage to Australia. It was not a very successful vessel. It was considered less suitable: boven water heel onsterck en swack (very weak above the waterline) (Heeres 1899, p. 28).
36. The Dutch term 'sloep' can be translated as shallop in the sense of a utility vessel carried by a bigger ship. These vessels were primarily propelled by oars. The Dutch term 'sloep' can also be used for a small sailing vessel in which case the English translation is sloop.
37. Hoorn refers to the place in the Netherlands where this type of vessel was developed at the end of the 16th century.
38. The ratio between beam and length was never more then 1:5. Over the period studied, the dimensions and features of the flute were often the subject of detailed discussions by the VOC.
    NA 1.04.02 (VOC) – 100 Res H XVII maart 1620:
    Onder voorvallende saecken, Maendach den 23 Marty 1620.
    Is geordonneert, om Indien met behoorlycke cleyne schepen te versien dat men tegens ult.o september toecomende sal gereet maecken. ses cleyne fluyten waer van dry sullen werden getimmert van amsterdam een tot middelburch een tot Hoorn & een tot Enckhuysen slecht & recht sonder galderyen ofte eenigh onnodich Sieraet, van tjarter als volcht twee van hondert vyff voeten lanck over Steven tweentwintich voeten wyt binnen de huijt hol elff voeten twee van 96 voeten lanck 20 voeten wyt 10 ¾ voeten holl: twee van 80 voeten lanck 17 voeten wijt 10 ½ voeten holl: sonder verdeck, marsen ofte andere andere wintvanck de groote versien met 4 Gotelingen & eenige Steenstucken & dander naer proportie …
    NA 1.04.02, VOC 232, 22-8-1639:
    Hebben d'heren van de werff gerapporteert dat sij een fluydtschip voorde compe- gecocht hebben voor sestienduijsent …hondert gl- met 16 stucken geschudt, oudt 2 ½ jaer, lanck 123 voet, wijdt 26 , 12 voet hol
    Stapel 1927, p. 469:
    Een fluyt of bootje Langh 90 voeten, wijt 22, hol 8 ½, daarboven 4 ½, dogh voor 3 ½
    NA 1.04.02, VOC 235, 8-11-1655:
    Certer te bouwen fluyt 138 x 31 x 14 ½ boven 6 ½ (Stapel 1927, p. 469) Na het eyndigen van den voorsch oorlog en dat geoordeelt wiert dat de Compagnie beter soude wesen gedient van fluyten als van spiegelschepen, alsoo die onkostelycker en met minder volck kunnen werden gevoert, sijn daartoe de volgende charters beraamt (Siet de resolutiën van de 17ne van 5 April 1656 en 12 April 1657) Van een grote fluyt langh 138 à 140 voeten, wijt 31, hol 14 ¼, 't verdeck 6 ¼, back en stuyrplegt op 6 of minder, soo het bequamelijck kan geschieden. Van een kleynder fluyt langh over steven 120 voeten, wijt binnens huyts 26, hol 11 ½, daarboven 5, met byvoegingh van een specificatie van de dickte en swaarte van 't hout, dat daartoe soude moeten werden genomen. Van een kleyne fluyt langh over steven 100 voeten, wijt 22, hol 9, 't verdeck 4 ½.
39. There are no English equivalents for these vessel types. The English smack being different to the Dutch smack and the kaag being a ship-type unfamiliar to the English
40. It should be noted that most VOC flutes were not newly built when they came into service of the VOC.
41. No records have been found to indicate otherwise
42. Already in the early voyages to Asia, fresh fruit was mentioned as a remedy against scurvy:
    (Rouffaer & IJzerman 1929, p. 145) den 11en ditto zijn wij tsaeijl ghegan wtt diee baeij, ghenampt

Aguade dee Sanbras; ouermidts dat wij daer gheen lamoene nochte aplen van oraanghen wonden om die scheurbuijck tee werdrijven
(Keuning 1962, p. 5)
De schipper Symen Hoen bracht oranges ...die ons daerna veel goets deeden doen de scheurbuyck het volck began te plaghen.
(Commelin 1646a, p.1)
Den 21 December uyt Texel ..ghegaen .. Den 2 May gekomen inde Bay van Antongil, daer ons versch water in nemende / sijn den 6 dito naer Bantam t'zeyl gegaen / wel van Lemoenen / ende Orange-Appelen / teghens t'scheurbuyt versien sijnde

43. wiert een Thuyn op de Compaggie vaerdich gemaeckt / die met Salade / Thuyn-kers/ Pieterselie saet besayet ; ende met Miredyck wortelen beplant wiert
Den 18 ditto [03-32] .. hoochte 23 graden 17 minuten [zuider¬breedte] ... hebben dat etmael 53 mylen geseylt / namen de bramstengen/ boven blint / ende kruyszeylen af / passeerden Tropicum Capricorni ; hadden alsdoen den eerste Salade uyt haer Thuyn / ende voor 14 dagen Miredick bladen / Thuyn-kers / ende kleyne Radys welcke de siecken / die 't scheurbuyt hadden / dagelijckx mede gedeelt is…
44. De dryerlye maniere van schepen, die deheeren dienen te sendenende continuelijcken te onderhouden zijn dese :
Verscheydene wel gemonteerde oorlochschepen (gelijck alreede een gesonden hebben),omme soo hier soo daer ten oorloghe alleene te gebruycken,te weten,eenighe sware ende eenighe lichte...
Soo veele ende alsulcke groote sware lastvoerende schepen, omme de retouren van Bantam naer 't patria te keeren als daertoe jaerlijcx gelieven overgesonden te hebben
Ten derden is seer hooch nodich, dat Ue herwaerts sent verscheydene lastvoerende gaingen, ende dat dryerlye ofte tot drye besundere eynden,te weten eenige slechte schepen vol soldaten ende bootsgesellen, scheepsprovisie ende viveres tot versterckinge ende provisie voor de forten ende schepen in Indien zijnde, omme gesleten te worden als ter gedistineerde plaetse gearriveert sullen zijn. Ten tweeden verscheyde gaingen off schepen, die veel lasten mogen voeren ende met weynich volck geregiert connen worden, omme de Molucques ende Banda met rijs, sagou, arack ende andere nootlijckheden daermede te versien ende wederomme uyt de Molucques, Amboina, Banda ende Solor na Jaccattra off Bantam te brengen de speceryen ende sandelhout, dewelcke jaerlijcx vergadert worden ende alsoo op dese vaerwateren te houden. Ten derden, zoo dienen eenige wel gemonteerde jachten in Indien te hebben gelijck als het schip der Goes, welcke bequaem sijn omme een goede last te voeren ende sich selfs te diffenderen ende den vyant te comen offenderen omme van Bantam na de custe van Choromandel te gebruycken, ende oock van Bantam op Patana, Siam ende Jappon ende wederomme van Japon op Bantam, doch alhier dient daertoe een groot schip gebruyct te worden
45. Rate 1 prefabricated vessels
46. Decker, Hendrick – Middelen om uit te vinden de ware ladinge der Scheepen na hare groote (NA 1.10.48, Collectie Hudde 22, p. 30) ...' dat het gemelde schip Spierdyk,in Tessel binenkomende... niet dieper heeft gegan als 17 voeten, zynde wel 2 voet 10 1/4 duim boven de holte, waar op het by metinge van zyne charter gestelt is, doch onwedersprekelyk ruim 2 voeten ondieper als de 19 voeten, zoo de Compagnie dit zelve schip tot twee malen achter den anderen en noch veele andere schepen meer, ja zelfs dieper gaande, naar advenant hare holte, van hier naar India vertrekkende, geresolveert heeft af te laden en noch doorgaans wel doet afladen. 't Welk bewezen werd, door de hier aen volgende scheepen, alle uitgegaan en van de holte als by een ieder nevens haar diep gaan, volgens quitantie by de Lootze daar van gegeven... als te weeten'
47. (Opstal 1972, p.17)
De vloot zal geen koopmanschappen mee krijgen, alleen realen van achten en als ballast wat ijzer en lood
(NA 1.04.02, VOC 7343, 26-09-1615) onder 11 Coopmanschappen naer Indie, o.a.
100 000 # loot in cleyne schuytkens ofte stuckens
voor Coromandel
50 000 # isere Staven soo viercante als platte
10 000 # Stael iser Staaven
(NA 1.04.02, VOC 147, 12-10-1624)
Amsterdam zal 60 of 70 Θ pont lood copen om met de Delfshaven naar Cormandel gebracht te worden.
(NA 1.04.02, VOC 232, 02-12-1638)
Tachtichduysent pont loot voor haer schip [kamer Delft] t Hoff van Hollandt te kopen
(NA 1.04.02, VOC 232, 04-07-1638)
de heren van de equipage mogen 100.000 pondt loodt copen, waarvan 80.000 voor Eliphant en 20.000 voortjacht [Lisse]

48. Also called spiauter and regularly mentioned in VOC-sources, most probably an alloy of pewter and lead
49. (NA 1.10.30, Archief Geleijnessen de Jongh 18 ,p. 37)
[eisen voor de retouren van 1620 met een toelichting en toevoeging uit 1622]
Den tintiago ofte Spiaulter die wij voor desen alhier hebben gehadt, alsoo niet bekendt was, is van hier weder tot ballast naer Indien gesonden om op de custe coromandel ofte in Japon vertiert te mogen worden naerderhandt alsoo een partye terugge hebben gecregen tot ballast in t' Schip Amsterdam soo is de selve nu onlanch hier verkocht.... Dit soude mede eene Courante Chinese waere zijn, om t'herwaerts seynden tot ballast onder grenier van de schepen gevoert te worden also dan geene plaetse altoos occuperen soude wij verstaen dat op de Custe coromandel & in Japon mede groote quantiteyt soude connen werden vercoght met redelyck profyt..
(Blussé, Opstall & Ts`Ao Yung-Ho 1995, fol. 734r)
Schreven niettemin een briefken aen de opperhoofden onser schepen in Pehouw, waerin haer adviseerden dat 1400 ghroot kisten met poeyersuycker naer ons vaderlandt per berckhout bequamen, welcke die van Sutphen hadden over te nemen ende ongestort, bequamelijck te bergen, waerneven sonden voor Suratte 516 canassers met alluyn, die wij recommendeerden in Schiedam te schepen, ende apart, behoorlijck wech te stouwen om na desen moeyte en spillinge voor te comen, miits dat staet gemaeckt wierden in aenstaende ongeveer 900 a 1000 picols spiaulter te verwachten hadden, welck onder (tot ballast) soude werden gelecht.
50. Om den timmerluyden in Indien min werck te geven wenschen wij,dat UE. de verdubbelinge der schepen van de buytenste greene huyden gelieven noch eens soo dicht te laten spijckeren, als tot Amsterdam geschiet, waaruyt ongeloofflijck voordeel getrocken sal werden alsoo die huyden door het roest den worm soo weeren dattet een verwonderinge om te sien is. De heeren van Hoorn laeten dichter spijckeren als die van Amsterdam, daeraen het voordeel wert gespeurt, want de huyt door 't gemelte roest bijna onverganckelijcken wert, daerom dienen oock de spijckers niet langh, maer aen de hooffden dick te wesen ende selffs de hooffden mede grooter ende dicker als ordinaris. Tot Enckhuysen werden de boegen van de scheepen verdubbelt met eecke schuytenplancken, hetwelcke hout is dat wel buyge wil ende moy state ,maer het valt soo soet voor den worm, dattet ons hier veel werckx veroorsaackt; door 't eeckenhout can oock de roest sich niet soo verspreyen ende alsoo 't costelijcker valt als met greene deelen,soo bidden wij dat daertoe het greenen- voor het eeckehout, mits op 't dichtsts gespijckert sijnde, geprefereert werde
51. De timmeragie en reparatie aen scheepen in India cost de compa. groott geltt ende worden de scheepen pricepal. de groote na behooren niet versien, t'is over sulcx gants noodich, alle swaere reparatie aen schepen soo veel doenel. geexcuseertt wordtt…. ende t'ordonneeren datt de costel. oorlogh- ende goede andre schepen op zijn oorboor ende ter behoorlijcker tijtt als retourschepen gebruijckt worden, gel. Ao. 29 mett Uttrecht geschiede. Cleene jachten moeten in India geholpen worden, dan connen eenighe jaren mett kiel haelen voor datt vertimmeringh vereischen, onderhouden worden, schuijts en boots dienen oock ter vaerte gesonden gelijck meede eenighe chaloepen voorde Cust Choromandel ende elders omme t'timmeren soo veel moogelijck in India t'excuseeren
52. During the whole period calamities with an immobilised crew occurred.. See:
(Coolhaas 1953, p. 1631)
Als voorengemelt, arriveerden hier [Ambon] den 8en Januarij ao stanti [1629] de scheepen den Briel, Purmerent ende 't fregatt Suratte met seer debil volck, invoougen om 't schip te regeeren geen vijff gesonde persoonen overschooten.
(NA 1.04.02, VOC 1203, fol. 484-485v) Lourens Pitt van Paliacatte aan van Kittensteijn 24-10-1653
op 18 stanti (al niet meer verwacht door verlopen moesson) gearriveerd Reijger op 16 augustus in comp van de jachten Concordia, Avontsterre ende uijtgeest [Utrecht] en de fluytschepen Salm en Coninck van Polen van Gamron herwaerts vertrocken en omtrent de bay van Gale den 10 deser door een stormweder gesamentlijck van anckers gespilt... in 7 etmael dese rede bereickt
De Reijger was seer desolaet gearriveert, swack van volck.. is nu versien van 18 Nederlantse soldaten van het guarnisoen en 10 inlantse bootgesellen.
(NA 1.04.02, VOC 1214, fol. 295)
De fluit pellicaen is hier den 8en Mey wel onverwacht van sijn verloren reijse naer gale te rede gecomen, beladen met siecken, sulcx pas machtigh waren t schip te regeren, 28 der selver sijn hier aenstonts in hospit=l gesonden waervan reede 10 personen sijn gestorven.
53. The galjoot Appelboom sailed to Asia with a crew of 14 of which 8 died (Coolhaas 1968, p. 79)
54. The retourschip Nieuw Delft (ID:711arrived at the Sumatra coast with only 35 man who could do work on board.

55. The local currency, a small golden coin that was produced in large quantities by the mint in Negapatnam after 1662 (Jacobs 2000, p. 77)
56. The exact length of a fathom (vadem) is not clear. In the 17th century vadems in use by the Dutch varied. Most common were the vadem of six Rijnland feet (1.88 m.) or of six Amsterdam feet (1.70 m).
57. Many types of currency were in use during the period of this study. Where possible the guilder will be used as the standard. The different currencies were also a problem for the VOC. Right after they were established in 1602 it was decided that the accounts for all the chambers or departments would be made up in guilders (NA 1.04.02, VOC 99, 20-04-1602)
58. The difficulty with the design of this type of diving device is to keep the hose open for the air supply. On deeper dives the difference in air pressure will also create problems. In Finland an 18th century leather dive suit has survived – the problem with the hose was solved by reinforcing it with wooden pipes. (Maarleveld 1990, p. 20)
59. Dutch sea mile is 7.4 kilometres
60. Nieuw Enckhuysen (ID:581), 400 last, built 1636
61. Witte Duyf (ID:792), 190 last,in service since 1647
    Witte Paard (ID:787), 170 last, built 1646
    Overschie (ID:754), 180 last, built 1644
    Trouw (ID:811), 250 last, built 1649
    Os (ID:786), 200 last, built 1646
    Koe (ID:784), 180 last, built 1646
62. Swarte Beer (ID:743), 190 last, built 1644
63. Santdijck or Zaandijk (ID:790), 150 last, built 1646
64. Hillegaersberg (ID:750), 180 last, built 1644
    Pellicaen (ID:807), 150 last, built 1648
    Potvis (ID:818), 150 last, built 1649
65. Hulst (ID:782), 200 last, built 1646
    Maasland (ID:751), 170 last, built 1644
66. Liefde (ID:785), 250 last, built 1646
    Vrede (ID:721), 400 last, built 1642
67. Koning van Polen (ID:769), 255 last, built 1645
    Robyn (ID:820), 240 last, built 1649
68. Kampen (ID:73), 190 last, built 1646 , Witte Valk (ID:779), 170 last, built 1645
69. Nassouw (ID:412), 450 last, built 162
70. Wesel (ID:486), 550 last, built 1630
71. Reiger (ID:808), 280 last, built 1648
72. 1623 jacht Valk, vrijliedenjacht Bonijt, 1625 jonk Sincan, 1628 jacht Woerden, 1629 veroverd jacht Batavia, 1634 jonk Girim,1637 fluit Swaen, 1639 fluit Son, 1641 jachtje kleen Rotterdam, 1643 jonk Quelang, 1645 jonk Taiwan, jonk Tamsuy, 1647 fluit Jonker, 1648 fluit Potvis, 1654 fluit Lam, retoruschip Vreede, 1655 galjoot Vleermuis, 1656 jacht Maarsen.
73. Only the first stage of the analysis of the shipping encompasses a longer period of 15 years, i.e. up to 1610. The reason is that 1610 is a demarcation date in the organisation when the VOC set up a permanent structure in Asia. On the other hand, no specific demarcation year can be found to discriminate early ("Voorcompagnieën") voyages in Asia from those made by the VOC, so all "early" voyages which had the "trading round-tour" character are included in one stage.
74. 'Spice Islands' is a collective noun for the following regions: the islands Ternate, Tidore (area 88), Ambon (area 85) and Banda (area 86).
75. This was specifically the case in the early period of the shipping when the VOC tried to adopt the local system of maintenance and repairs by bringing the vessels in shore on the river. This was the location where the locals kept their vessels in the off-season. For the VOC it turned out to be more efficient to sail back regularly to Batavia or, later in the 17th century, to Galle for maintenance and repair.
76. The first stage of the analysis of the shipping encompasses a longer period of 15 years, i.e.1595 to 1610. The reason being that 1610 is a demarcation date in the organisation; the date the VOC set up a permanent structure in Asia.
77. Beeckman discussed the shape of the underwater body with shipbuilders and studied, for example, the working of the rudder and other sailing features of a ship. Stevins contribution was in the field of stability. He studied the theoretical background of practical issues like the construction of a ship's superstructure.

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List of vessels in service during the period 1596-1660

ID	*Name*	*Last*	*Year in*	*Year out*	*Rate*
1	amsterdam	130	1595	1597	5
2	duifje	25	1595	1598	3
3	hollandia	230	1595	1602	8
4	mauritius	200	1595	1601	8
5	amsterdam	250	1598	1603	8
6	boodschap, blijde	75	1598	1599	5
7	eendracht	25	1598	1599	3
8	friesland	90	1598	1601	5
9	gelderland	220	1598	1603	8
9	gelderland	220	1603	1606	8
10	geloof	160	1598	1600	5
11	hendrik frederik	175	1598	1601	8
12	hoop	250	1598	1600	8
13	hoop	25	1598	1600	3
14	langebark	150	1598	1602	5
15	leeuw	200	1598	1600	8
16	leeuwin	125	1598	1600	5
17	liefde	150	1598	1600	5
18	maan		1598	1598	0
19	mauritius	125	1598	1601	5
20	overijssel	45	1598	1602	3
21	trouw	110	1598	1601	5
22	utrecht	120	1598	1603	5
23	zeelandia	200	1598	1603	8
24	zon	70	1598	1603	5
25	hof van holland	180	1599	1603	8
26	maan	250	1599	1606	8
27	morgenster	70	1599	1601	5
28	nassau	180	1599	1601	8
29	nederland	200	1599	1601	8
30	postillion	8	1599	1599	1
31	verenigde landen	200	1599	1601	8
32	zon, grote	290	1599	1604	8
33	amsterdam	400	1600	1605	8
33	amsterdam	400	1605	1608	8
34	arend, witte	300	1600	1603	8
35	arend, zwarte	300	1600	1603	8
36	delft	180	1600	1601	8
37	dordrecht	450	1600	1602	8

ID	*Name*	*Last*	*Year in*	*Year out*	*Rate*
37	dordrecht	450	1603	1607	8
38	gouda	140	1600	1603	5
38	gouda	130	1604	1612	5
39	haarlem	175	1600	1604	8
40	leiden	140	1600	1604	5
41	sloep v/d maan		1600	1600	0
42	sloep v/d zon	8	1600	1600	1
43	alkmaar	200	1601	1604	8
44	duifje	25	1601	1603	3
45	eendracht	130	1601	1610	5
46	enkhuizen	100	1601	1603	5
47	hoorn	200	1601	1603	8
48	lam	30	1601	1604	3
49	leeuw, groene	100	1601	1603	5
50	leeuw, rode	200	1601	1601	7
51	leeuw, witte	270	1601	1608	8
52	leeuw, zwarte	300	1601	1603	8
52	leeuw, zwarte	300	1605	1608	8
53	lint, de		1601	1602	0
54	middelburg	200	1601	1603	8
55	ram	55	1601	1605	3
56	schaap	55	1601	1604	3
57	wachter	65	1601	1604	3
58	zeelandia	300	1601	1616	8
59	claes		1602	1602	0
60	erasmus	270	1602	1609	8
61	goes	120	1602	1605	5
62	hollandia	300	1602	1607	8
62	amsterdam	300	1607	1610	8
63	hollandse tuin	220	1602	1605	8
64	jago, sint	400	1602	1604	8
65	maagd van enkhuizen	160	1602	1604	5
66	mauritius	400	1602	1608	8
67	nassau	160	1602	1608	5
68	papegaaitje	25	1602	1605	3
69	rotterdam	100	1602	1605	5
70	sterre	200	1602	1604	8
71	vlissingen	200	1602	1606	8
72	zierikzee	300	1602	1607	8
73	amsterdam	350	1603	1607	8
73	gelderland	350	1607	1615	8
74	catharina, st	700	1603	1604	8
75	delft	150	1603	1610	5
76	duifje	30	1603	1608	3
77	enkhuizen	150	1603	1607	5
78	hof van holland	180	1603	1605	8
79	hoorn	350	1603	1611	8
79	hoorn	350	1613	1620	8
80	medemblik	125	1603	1608	5
81	provinciën, geunieerde	350	1603	1615	8
82	westfriesland	350	1603	1606	8
83	mozambique	60	1604	1605	3

ID	*Name*	*Last*	*Year in*	*Year out*	*Rate*
84	anthonio, san	700	1605	1609	8
85	middelburg	300	1605	1606	8
86	oranje	350	1605	1614	8
87	patani	50	1605	1606	2
88	provinciën, geunieerde	200	1605	1608	8
89	zon, grote	270	1605	1610	9
90	zon, kleine	120	1605	1611	5
91	banda	350	1606	1615	8
92	bantam	350	1606	1613	8
93	ceylon	170	1606	1616	8
94	china	210	1606	1608	8
95	jonk van quackernaet		1606	1606	0
96	patani	170	1606	1615	8
97	veere, ter	350	1606	1617	8
98	walcheren	350	1606	1608	8
99	arend	110	1607	1610	5
100	delft	400	1607	1622	8
101	griffioen	110	1607	1612	5
102	hert		1607	1607	0
103	hollandia	500	1607	1618	8
104	jager	50	1607	1610	3
105	leeuw, rode met pijlen	230	1607	1615	9
106	madagaskar	30	1607	1608	3
107	middelburg	500	1607	1617	8
108	pauw	110	1607	1614	5
109	rotterdam	400	1607	1616	9
110	sloep v/d gelderland	10	1607	1608	1
111	sloep v/d westvriesland	10	1607	1607	1
112	valk	100	1607	1610	5
113	draak	10	1608	1611	1
114	fregat, spaensch	35	1608	1608	3
115	hoop	40	1608	1610	3
116	middelburg, klein	10	1608	1610	1
117	sloep v/d zeelandia	10	1608	1608	2
118	hazewind	60	1609	1615	3
119	maan, halve	40	1609	1619	3
120	sloep v/d delft	10	1609	1610	1
121	sloep v/d walcheren		1609	1610	0
122	brak	40	1610	1613	3
123	goes	180	1610	1618	8
124	leeuw, witte	320	1610	1613	8
125	leeuw, zwarte	350	1610	1619	8
126	nederland		1610	1610	0
127	sloep uit amboina	10	1610	1611	2
128	ternate	50	1610	1610	3
129	vlissingen	300	1610	1619	8
130	wapen van amsterdam	430	1610	1622	8
131	aeolus, grote	170	1611	1613	9
132	duifje	25	1611	1617	3
133	leeuw, groene	90	1611	1621	5
134	leeuw, rode	200	1611	1617	9
135	maan, grote	225	1611	1619	9

ID	*Name*	*Last*	*Year in*	*Year out*	*Rate*
136	ster	90	1611	1617	5
137	veer, klein der	10	1611	1612	2
138	zon	200	1611	1621	9
139	arrakan	35	1612	1612	3
140	enkhuizen, klein	25	1612	1618	3
141	hoop	250	1612	1617	7
142	tanassery	30	1612	1613	3
143	aeolus, kleine	120	1613	1616	5
144	arend	125	1613	1620	5
145	mauritius	500	1613	1633	8
146	nassau	150	1613	1619	5
147	neptunus	120	1613	1622	5
148	valk, witte	180	1613	1619	7
149	wapen van amsterdam	450	1613	1618	8
149	amsterdam	450	1619	1628	8
150	zeelandia	400	1613	1624	8
151	aeolus, grote	170	1614	1617	7
152	beer, witte	155	1614	1628	5
153	beer, zwarte	160	1614	1625	5
154	engel	300	1614	1620	8
155	enkhuizen	300	1614	1624	8
156	fortuin	140	1614	1616	8
157	hert	125	1614	1622	5
158	jacatra	25	1614	1619	3
159	jager	70	1614	1622	5
160	maan, grote	300	1614	1623	9
161	meeuwtje	30	1614	1614	3
162	morgenster	200	1614	1622	9
163	oranjeboom	180	1614	1622	7
164	sloep v/d middelburg	15	1614	1615	1
165	sloep v/d zeelandia		1614	1614	0
166	walcheren	300	1614	1630	8
167	zon, grote	300	1614	1617	9
168	bantam	25	1615	1616	2
169	bergerboot	150	1615	1622	5
170	ceylon	50	1615	1616	3
171	dolfijn	150	1615	1623	5
172	eendracht	180	1615	1620	7
173	galiasse	150	1615	1622	4
174	hollandia, klein	15	1615	1622	1
175	hoop	160	1615	1623	8
176	hoorn	55	1615	1615	3
177	jonk van siam, onse	50	1615	1615	2
178	jonk van simsuan	50	1615	1617	2
179	macassar	35	1615	1615	3
180	parel	50	1615	1616	3
181	bantam	400	1616	1627	8
182	ceylon	30	1616	1622	3
183	eendracht	350	1616	1622	8
184	jamby	20	1616	1616	3
185	japanse bark	20	1616	1617	1
186	leeuw, gouden	350	1616	1634	10

ID	*Name*	*Last*	*Year in*	*Year out*	*Rate*
187	nn		1616	1616	0
188	roeychaloupe	10	1616	1616	2
189	smak, de	20	1616	1619	2
190	trouw	300	1616	1624	8
191	vlissingen, klein	15	1616	1619	1
192	wapen van zeeland	400	1616	1627	8
193	westfriesland	400	1616	1622	10
194	brak	35	1617	1618	3
195	dedel	20	1617	1617	3
196	defence	200	1617	1617	0
197	eenhoorn	140	1617	1626	5
198	fortuin, goede	400	1617	1626	9
199	hazewind	35	1617	1617	3
200	jacatra	25	1617	1622	3
201	jamby	20	1617	1622	3
202	onrust	60	1617	1619	2
203	postpaard	150	1617	1626	5
204	singapore		1617	1617	0
205	spaans veroverd	35	1617	1618	3
206	taffasoa	35	1617	1619	3
207	tholen, ter	270	1617	1637	8
208	tijger	60	1617	1622	3
209	vlot, grote	60	1617	1623	2
210	vlot, kleine		1617	1617	0
211	vosje	30	1617	1624	3
212	zeewolf	180	1617	1623	7
213	zierikzee	400	1617	1628	8
214	zwaan	200	1617	1622	8
215	amsterdam, klein	100	1618	1621	5
216	banda		1618	1626	0
217	bode, vliegende	40	1618	1621	3
218	delft	80	1618	1618	5
219	dordrecht	350	1618	1630	10
220	haarlem	250	1618	1627	9
221	haas	30	1617	1622	2
222	hoop, goede	300	1618	1627	9
223	hoorn	30	1618	1622	1
224	hoorn, nieuw	350	1618	1619	9
225	jacob dircxs		1618	1618	0
226	jager	30	1618	1619	2
227	jortan	40	1618	1621	3
228	michel sint	300	1618	1620	8
229	palliacatte	30	1618	1618	2
230	salomon	100	1618	1618	5
231	thomas	100	1618	1619	0
232	beer, engelse	180	1619	1627	7
233	bima	30	1619	1619	3
234	dolfijn	26	1619	1623	0
235	draak, engelse	300	1619	1622	8
236	expeditie	200	1619	1620	8
237	hollandia	350	1619	1643	10
238	hond, engelse	200	1619	1622	8

ID	*Name*	*Last*	*Year in*	*Year out*	*Rate*
239	hoorn	35	1619	1620	3
240	jonk van hans keyser		1619	1620	0
241	leiden	360	1619	1638	10
242	medemblik	170	1619	1634	7
243	nassau	70	1619	1620	5
244	samson	200	1619	1624	8
245	schoonhoven	250	1619	1626	7
246	sloep, advies van de gouen leeuw	15	1619	1619	1
247	sterre, engelse	150	1619	1620	5
248	vrede	180	1619	1631	8
249	wapen van enkhuizen	400	1619	1628	10
250	wapen van hoorn	300	1619	1636	10
251	alkmaar	400	1620	1625	9
252	amboina, klein	40	1620	1622	3
253	arrakan	40	1620	1623	3
254	bruinvis	40	1620	1622	3
255	gouda	400	1620	1624	10
256	groningen	300	1620	1628	8
257	haan	70	1620	1628	5
258	haring	145	1620	1632	5
259	hazewind	60	1620	1628	3
260	heilbot	50	1620	1621	3
261	malakka	35	1620	1620	3
262	middelburg	600	1620	1625	10
263	muiden	145	1620	1623	5
264	muis	25	1620	1630	3
265	naarden	145	1620	1623	5
266	noordholland	400	1620	1628	9
267	oranje	180	1620	1630	7
268	pera	35	1620	1627	3
269	purmerend	155	1620	1629	5
270	schiedam	200	1620	1633	7
271	ternate	90	1620	1620	5
272	valk	60	1620	1623	3
273	wapen van delft	450	1620	1637	10
274	wapen van jacatra	40	1620	1628	3
275	weesp	115	1620	1637	5
276	zuidholland	400	1620	1629	9
277	arnemuiden	70	1621	1629	5
278	borneo	50	1621	1622	2
279	china		1621	1621	0
280	cruz, st	50	1621	1622	3
281	delfshaven	200	1621	1633	7
282	diamant		1621	1624	0
283	edam	180	1621	1633	6
284	enkhuizen	35	1621	1623	3
285	firando	300	1621	1623	8
286	fortuin, goede	25	1621	1628	3
287	gorkum	180	1621	1630	6
288	heusden	155	1621	1634	5
289	jacatra		1621	1621	0
290	kaag	20	1621	1622	2

ID	*Name*	*Last*	*Year in*	*Year out*	*Rate*
291	laurens,sint	50	1621	1624	3
292	leeuwin	250	1621	1640	7
293	mocha	40	1621	1636	3
294	monnikendam	200	1621	1629	8
295	nossa senhora de		1621	1621	0
296	palliacatte	40	1621	1627	3
297	pegu	35	1621	1623	3
298	solor	35	1621	1622	3
299	suratte	35	1621	1630	3
300	tholen, klein	60	1621	1626	3
301	victoria	30	1621	1625	1
302	wapen van rotterdam	500	1621	1637	10
303	westkappelle	60	1621	1628	3
304	woerden	180	1621	1628	7
305	anthonio, san	40	1622	1622	3
306	arnhem	40	1622	1624	3
307	batavia		1622	1625	0
308	bengalen	50	1622	1622	3
309	bier en brootspot		1622	1622	0
310	bonijt		1622	1623	0
311	brak	40	1622	1624	3
312	brotcha	40	1622	1625	3
313	erasmus, klein	155	1622	1630	5
314	hoop, kleine	35	1622	1623	3
315	jamby		1622	1622	0
316	makreel	140	1622	1628	4
317	mallabar	40	1622	1623	3
318	massulipatnam	40	1622	1623	3
319	nicolaas sint	100	1622	1628	5
320	robijn		1622	1624	0
321	roeychaloupe open		1622	1622	0
322	singapore	50	1622	1623	3
323	timor	40	1622	1624	3
324	amsterdam	400	1623	1626	9
325	arend	200	1623	1628	7
326	cotchin	40	1623	1628	3
327	david, koning	180	1623	1627	7
328	delft	400	1623	1626	9
329	eendracht	300	1623	1626	9
330	goa	40	1623	1626	3
331	griffioen	160	1623	1629	5
332	haas	75	1623	1629	5
333	hazewind	30	1623	1623	3
334	hollandia	300	1623	1628	9
335	hoop	150	1623	1629	5
336	jager	40	1623	1626	3
337	mauritius	280	1623	1629	9
338	nachtmery		1623	1623	0
339	nassau	50	1623	1623	3
340	onrust	10	1623	1624	2
341	oranje	350	1623	1628	9
342	rendezvous	50	1623	1624	3

ID	*Name*	*Last*	*Year in*	*Year out*	*Rate*
343	sloep v/d dordrecht		1623	1623	0
344	tortelduif	40	1623	1628	3
345	anthonio, san		1624	1624	0
346	arnemuiden, klein	40	1624	1625	3
347	bon remedio	35	1624	1630	3
348	cambodja	15	1624	1625	0
349	celebar	20	1624	1625	0
350	cruz, st	40	1624	1624	3
351	fortuin	50	1624	1626	3
352	gouda, klein	10	1624	1624	1
353	jamby, klein	40	1624	1624	3
354	leeuwin, jonge	10	1624	1628	1
355	madre de dios	15	1624	1624	0
356	nicolaas, st		1624	1624	0
357	nieuwigheid	36	1624	1629	1
358	parel		1624	1625	0
359	pulo-ay		1624	1625	0
360	tanassery	20	1624	1628	3
361	trouw		1624	1624	0
362	zeelandia, klein	35	1624	1625	3
363	dordrecht, klein		1625	1625	0
364	engelenbak		1625	1625	0
365	ghift		1625	1626	0
366	heemstede		1625	1625	0
367	kameel	270	1625	1630	8
368	lontor	20	1624	1625	0
369	meeuw	10	1625	1627	2
370	monnikendam		1625	1625	0
371	packan		1625	1625	0
372	parel, kleine		1625	1625	0
373	parel, nieuwe	150	1625	1636	5
374	provinciën		1625	1625	0
375	pulo-ay		1625	1625	0
376	revenge		1625	1627	0
377	sinckan	50	1625	1625	2
378	taiwan	40	1625	1631	3
379	valk	35	1625	1636	3
380	victoria	55	1625	1630	3
381	amstelveen	200	1625	1631	6
382	beverwijk	175	1626	1631	6
383	bijenkorf		1626	1627	0
384	bommel	150	1626	1639	5
385	briel, den	200	1626	1631	7
386	diemen	60	1626	1637	3
387	domburg	50	1626	1630	3
388	grotebroek	150	1626	1634	5
389	jacinto, sao	200	1626	1626	8
390	oranje	50	1626	1628	2
391	ouderkerk	60	1626	1628	3
392	sloten	70	1626	1633	5
393	zeepaard, gulden	300	1626	1640	8
394	anthonio, san	150	1627	1627	0

ID	*Name*	*Last*	*Year in*	*Year out*	*Rate*
395	arend, zwarte	180	1627	1635	7
396	arnemuiden, klein	50	1627	1630	2
397	batavia	150	1627	1629	5
398	bon successo	35	1627	1627	3
399	bon successo		1627	1627	0
400	brouwershaven	200	1627	1634	7
401	bruinvis		1627	1627	0
402	chincheo	40	1627	1629	3
403	draak, vliegende	250	1627	1627	8
404	duif	35	1627	1629	3
405	frederik hendrik	700	1627	1646	10
406	galiasse	200	1626	1640	7
407	heusden, klein	30	1627	1630	3
408	hoop	20	1627	1634	3
409	huis van nassau		1627	1627	0
410	kampen	250	1627	1627	8
411	kemphaan	50	1627	1633	3
412	nassau	450	1627	1652	10
413	nera	50	1627	1629	3
414	prins willem	350	1627	1637	10
415	queda	50	1627	1627	3
416	roermondt		1627	1627	0
417	terschelling	40	1627	1630	3
418	texel	100	1627	1638	5
419	utrecht	200	1627	1641	9
420	veere, ter	175	1627	1641	9
421	velzen	170	1627	1635	6
422	vianen	300	1627	1629	10
423	vlieland	40	1627	1637	3
424	vlissingen	200	1627	1638	9
425	wieringen	60	1627	1636	3
426	zeeburg	50	1627	1637	3
427	assendelft	190	1628	1636	6
428	batavia	500	1628	1629	10
429	batavia		1628	1628	0
430	buren	170	1628	1640	9
431	cotchin		1628	1628	0
432	david, kleine	50	1628	1630	3
433	gouverneur Coen		1628	1628	0
434	gravenhage, 's	250	1628	1638	9
435	grisseck		1628	1628	0
436	holland, klein	50	1628	1628	3
437	jager	80	1628	1630	5
438	negapatnam	30	1628	1634	3
439	pehou	50	1628	1633	2
440	sincan	50	1628	1631	2
441	soulang		1628	1628	0
442	vlissingen	300	1628	1628	0
443	walcheren	300	1628	1628	0
444	zaandam	190	1628	1637	6
445	zeelandia		1628	1628	0
446	zoutelande	60	1628	1629	3

ID	*Name*	*Last*	*Year in*	*Year out*	*Rate*
447	amboina	350	1629	1647	9
448	beets	270	1629	1636	7
449	boot v/d batavia		1629	1629	0
450	brak	100	1629	1638	5
451	broekerhaven	50	1629	1633	3
452	deventer	500	1629	1631	10
453	goes	170	1629	1641	7
454	leeuwarden	500	1629	1655	10
455	nassau		1629	1629	0
456	nijmegen	500	1629	1632	10
457	oostzanen	50	1629	1630	3
458	parel, kleine	90	1629	1637	0
459	rammekens	40	1629	1631	2
460	reigertjen		1629	1629	0
461	westzanen	50	1629	1637	3
462	zalm	40	1629	1635	3
463	amoij		1630	1630	0
464	batavia	50	1630	1637	3
465	bloempot	20	1630	1636	0
466	boodschap, droevige	50	1630	1630	2
467	buis, gulden	40	1630	1630	0
468	ceylon	180	1630	1633	7
469	cotchin	100	1630	1636	5
470	egmond	185	1630	1645	7
471	goudsbloem		1630	1632	0
472	hof van holland	350	1630	1638	9
473	japan		1630	1630	0
474	katwijk	50	1630	1633	3
475	koudekerke	50	1630	1640	3
476	macao	80	1630	1634	5
477	malakka	35	1630	1631	3
478	manilha	30	1630	1631	3
479	middelburg	600	1630	1649	10
480	middelburg		1630	1630	0
481	noordwijk	150	1630	1637	5
482	rijswijk	50	1630	1630	3
483	wankan	50	1630	1630	2
484	warmond	150	1630	1639	4
485	wassenaar	185	1630	1644	7
486	wezel	550	1630	1652	10
487	amboina	50	1631	1633	3
488	anhay	50	1631	1631	2
489	banda	25	1631	1638	2
490	falcon	35	1631	1632	3
491	grol	130	1631	1644	5
492	huisduinen	100	1631	1637	4
493	lelie	25	1631	1633	0
494	pulo-ay	10	1631	1636	2
495	rosengheyn		1631	1631	0
496	saccam		1631	1631	0
497	tamsuy	50	1631	1633	2
498	aemilia	600	1632	1639	10

ID	*Name*	*Last*	*Year in*	*Year out*	*Rate*
499	amsterdam	450	1632	1648	10
500	banda	3	1632	1637	0
501	blijswijk	50	1632	1641	3
502	boodschap, blijde	25	1632	1634	2
503	bosch, den	525	1632	1643	10
504	breedam	145	1632	1644	5
505	daman	80	1632	1637	5
506	fortuin, goede		1632	1636	0
507	hoop		1632	1632	0
508	hoorn	450	1632	1637	10
509	ijsselstein	50	1632	1632	3
510	maan	50	1632	1636	3
511	oudewater	145	1632	1646	5
512	sloep, grote	10	1632	1632	2
513	sterre	50	1632	1636	3
514	tancoya		1632	1632	0
515	veenhuizen	60	1632	1641	3
516	venlo	60	1632	1647	3
517	zeelandia	525	1632	1657	10
518	zon	80	1632	1636	5
519	zutphen	450	1632	1651	10
520	amoij		1633	1633	0
521	anthonio, san		1633	1633	0
522	balam		1633	1633	0
523	banda	375	1633	1659	10
524	barnsteen		1633	1634	0
525	bovenkarspel	20	1633	1633	1
526	coupan	50	1633	1633	2
527	goa	30	1633	1634	3
528	kameleon	50	1633	1635	3
529	nassau, klein	14	1633	1640	1
530	pinto	50	1633	1633	2
531	quelang		1633	1633	0
532	quinam	50	1633	1633	2
533	revenge	50	1633	1642	3
534	schagen	200	1633	1644	6
535	sloterdijk	20	1633	1633	1
536	souburch	20	1633	1637	1
537	warmond, klein	50	1633	1633	2
538	wezel, klein	20	1633	1638	1
539	zwaan	200	1633	1637	6
540	amboina	50	1634	1635	3
541	amsterdam		1634	1634	0
542	bardes	50	1634	1637	3
543	bode, vliegende	25	1634	1634	2
544	cabo de rama	40	1634	1641	3
545	girim	50	1634	1634	2
546	jago, sint		1634	1634	0
547	langerak	50	1634	1641	3
548	limburch	75	1634	1636	5
549	maastricht	300	1634	1651	10
550	nachtegaal, zeeuwse	30	1634	1643	1

ID	*Name*	*Last*	*Year in*	*Year out*	*Rate*
551	nieuwigheid	36	1634	1637	0
552	petten	217	1634	1649	6
553	rarop	200	1634	1640	6
554	rithem	200	1634	1643	6
555	robijn		1634	1635	0
556	zandvoort	100	1634	1647	5
557	amboina, klein		1635	1635	0
558	china	50	1635	1635	3
559	dolfijn	23	1635	1638	1
560	fortuin	50	1635	1636	3
561	harderwijk	350	1635	1652	10
562	hollandia, klein	23	1635	1642	1
563	hooghkarspel	23	1635	1637	1
564	malakka	30	1635	1636	0
565	manilha	50	1635	1636	3
566	nangasacque		1635	1636	0
567	neptunus	23	1635	1637	1
568	petten, klein	14	1635	1641	1
569	rotterdam, klein	23	1635	1641	1
570	singapore		1635	1635	0
571	voorburg	23	1635	1642	1
572	waterland	23	1635	1641	1
573	waterloose werve	23	1635	1642	1
574	akersloot	180	1636	1652	7
575	amsterdam, klein	23	1636	1641	1
576	arrakan	55	1636	1638	3
577	batavia	70	1636	1637	5
578	breedam, klein	25	1636	1641	3
579	campher	50	1636	1636	3
580	duif	200	1636	1650	6
581	enkhuizen	400	1636	1661	10
582	enkhuizen, klein	23	1636	1646	1
583	haarlem	350	1636	1647	10
584	hoorn, klein		1636	1637	0
585	keizerin	200	1636	1637	6
586	maria		1636	1636	0
587	oostkapelle	200	1636	1645	6
588	otter	200	1636	1643	6
589	prins, jonge	23	1636	1645	1
590	prinses maria	40	1636	1636	2
591	quinam	50	1636	1636	2
592	roemerswaal	40	1636	1649	3
593	valk	60	1636	1638	3
594	vos	40	1636	1644	3
595	wapen van alkmaar		1636	1636	0
596	westhoven	23	1636	1645	1
597	wilde vercken		1636	1636	0
598	zwolle	300	1635	1639	10
599	amsterdam		1637	1637	0
600	bon successo		1637	1637	0
601	broekoord	200	1637	1648	6
602	bruinvis		1637	1637	0

ID	*Name*	*Last*	*Year in*	*Year out*	*Rate*
603	diemen	50	1637	1637	2
604	graft	200	1637	1646	6
605	henriëtte louise	385	1637	1664	9
606	hoop, goede	50	1637	1638	2
607	hoop, goede	50	1637	1643	2
608	india	35	1637	1637	3
609	jonk, groote		1637	1637	0
610	leeuw, sluimerend		1637	1637	0
611	maan	200	1637	1642	6
612	maan, kleine	23	1637	1637	1
613	pibamba		1637	1637	0
614	rijnsburg	175	1637	1648	7
615	rijp, de	200	1637	1648	6
616	rijswijk	30	1637	1643	1
617	sterre	23	1637	1643	1
618	taiwan		1637	1637	0
619	valkenburg	150	1637	1647	5
620	wijdenes	80	1637	1643	5
621	zon	200	1637	1639	6
622	zon	23	1637	1639	1
623	arnemuiden	160	1638	1652	5
624	bode, vliegende		1638	1638	0
625	breda	525	1638	1662	10
626	delft	50	1638	1638	2
627	draak	40	1638	1641	2
628	engel	200	1638	1648	6
629	grijpskerk	100	1638	1653	5
630	holland		1638	1638	0
631	hollandia	50	1638	1638	2
632	leiden		1638	1638	0
633	noordster	200	1638	1649	6
634	pehou		1638	1638	0
635	rog	200	1638	1645	6
636	rog, kleine		1638	1638	0
637	serpent	25	1638	1640	2
638	tonijn	35	1638	1640	3
639	wachter	50	1638	1640	3
640	welsingen	40	1638	1649	3
641	zwaan, indische		1638	1638	0
642	anna, engelse	100	1639	1644	5
643	banda	14	1639	1642	2
644	capelle	200	1639	1648	6
645	castricum	180	1639	1652	6
646	david, kleine	50	1639	1645	3
647	david, koning	200	1639	1639	6
648	franeker	120	1639	1642	5
649	heemskerk	70	1639	1649	5
650	hert	200	1639	1643	6
651	limmen	60	1639	1652	3
652	lisse	80	1639	1652	5
653	maria		1639	1639	0
654	maria de medici	500	1639	1641	10

ID	*Name*	*Last*	*Year in*	*Year out*	*Rate*
655	meerman	140	1639	1652	4
656	middelburg	50	1639	1640	2
657	negapatnam	50	1639	1640	3
658	olifant, witte	500	1639	1661	10
659	pauw	200	1639	1647	6
660	zeelandia		1639	1639	0
661	zierikzee	280	1639	1639	7
662	zon	50	1639	1642	3
663	zutphen, klein	23	1639	1645	1
664	berkhout	200	1640	1653	6
665	brak	20	1640	1647	2
666	buis, gulden	175	1640	1641	6
667	dolfijn	200	1640	1648	6
668	eendracht	170	1640	1649	6
669	gale	40	1640	1644	2
670	galjoen, spaans	350	1640	1645	8
671	heemstede	200	1640	1650	6
672	jager	30	1640	1643	2
673	jamby	50	1640	1642	2
674	kelangh	50	1640	1643	2
675	kievit	55	1640	1659	3
676	leek	50	1640	1647	3
677	leeuw, oude	10	1640	1641	2
678	liefde	60	1640	1647	3
679	nassau, klein	23	1640	1641	1
680	neptunus	200	1640	1643	8
681	oranjeboom	175	1640	1647	6
682	rob		1640	1640	0
683	rog, kleine		1640	1640	0
684	salamander	525	1640	1661	10
685	snoek	280	1640	1655	7
686	tamsuy		1640	1640	0
687	uitgeest	300	1640	1654	6
688	utrecht		1640	1640	0
689	utrecht		1640	1640	0
690	walvis	500	1640	1663	10
691	waterhond	170	1640	1648	7
692	zaaier	200	1640	1650	6
693	zeehaan	200	1640	1647	6
694	amboina	10	1641	1642	2
695	amsterdam	600	1641	1643	8
696	bergen op zoom	150	1641	1650	5
697	lillo	120	1641	1657	5
698	malakka, nieuw	50	1641	1641	3
699	mauritius, klein	20	1641	1644	1
700	pipeli, klein	8	1641	1651	2
701	provinciën, verenigde	525	1641	1663	10
702	rotterdam	500	1641	1661	10
703	tijger	500	1641	1650	10
704	vogelstruis	500	1641	1653	10
705	wakende boei	25	1641	1646	3
706	amboina	10	1642	1644	2

ID	*Name*	*Last*	*Year in*	*Year out*	*Rate*
707	arend	300	1642	1649	8
708	breskens	40	1642	1646	3
709	campar	20	1642	1643	2
710	delfshaven	80	1642	1653	5
711	delft	550	1642	1652	10
712	fortuin	50	1642	1642	2
713	haan	240	1642	1650	7
714	hazewind	20	1642	1655	2
715	leeuwerik	40	1642	1657	3
716	lootsboot, grote	20	1642	1653	2
717	lootsboot, kleine	20	1642	1648	2
718	luipaard	160	1642	1650	5
719	taiwan		1642	1642	0
720	visser	20	1642	1646	2
721	vrede	400	1642	1654	10
722	westfriesland	575	1642	1661	10
723	zwaan	500	1642	1644	10
724	alkmaar	50	1643	1643	2
725	amsterdam		1643	1643	0
726	anthonio, san	50	1643	1643	3
727	eiland mauritius	550	1643	1644	10
728	gewelt, 't		1643	1643	0
729	haring	50	1643	1656	3
730	hof van zeeland	600	1643	1661	10
731	hollandia	50	1643	1644	2
732	hoop, goede	50	1643	1644	2
733	hoopwel	40	1643	1644	2
734	malakka	575	1643	1661	10
735	rijnsburg, klein	110	1643	1645	5
736	wingurla	50	1643	1645	3
737	zeehond	10	1643	1643	2
738	zeemeeuw	25	1643	1653	3
739	aagtekerke	60	1644	1650	3
740	andries, st		1644	1644	0
741	batavia	50	1644	1644	2
742	batavia	40	1644	1649	2
743	beer, zwarte	190	1644	1655	6
744	bosch, den		1644	1644	0
745	brak	50	1644	1644	2
746	diemen	50	1644	1645	2
747	gans, gouden	170	1644	1655	6
748	gapinge	50	1644	1654	3
749	hazewind	10	1644	1646	2
750	hillegersberg	180	1644	1659	6
751	maasland	170	1644	1652	6
752	makreel	50	1644	1656	3
753	oranje	600	1644	1661	10
754	overschie	180	1644	1654	6
755	post	110	1644	1657	4
756	schelvis	50	1644	1646	3
757	schiedam	400	1644	1654	10
758	utrecht	50	1644	1644	2

ID	*Name*	*Last*	*Year in*	*Year out*	*Rate*
759	westfriesland	50	1644	1644	2
760	zalm	180	1644	1657	6
761	zeelandia	50	1644	1644	2
762	zeewolf	170	1644	1654	6
763	bruinvis	60	1645	1658	3
764	formosa		1645	1645	0
765	haring, gulden	10	1645	1648	2
766	hoop, goede		1645	1645	0
767	jonker	240	1645	1647	6
768	juffer	240	1645	1650	6
769	koning van polen	255	1645	1661	6
770	malakka		1645	1645	0
771	nachtuil	17	1645	1645	2
772	overal		1645	1645	0
773	rob	120	1645	1655	5
774	sas van gent	25	1645	1656	3
775	sluis	120	1645	1663	5
776	taiwan	50	1645	1645	2
777	tamsuy	50	1645	1645	2
778	tonijn	25	1645	1646	3
779	valk, witte	170	1645	1658	6
780	david, koning	300	1646	1661	6
781	dromedaris	235	1646	1661	8
782	hulst	200	1646	1656	7
783	kampen	190	1646	1659	6
784	koe	180	1646	1652	6
785	liefde, gekroonde	250	1646	1659	6
786	os	200	1646	1657	6
787	paard, witte	170	1646	1659	6
788	patientie	240	1646	1661	6
789	prins, jonge	120	1646	1655	5
790	zaandijk	150	1646	1659	4
791	banda	14	1647	1653	2
792	duif, witte	190	1647	1650	6
793	griffioen	280	1647	1663	7
794	hoorn	25	1647	1651	2
795	noordholland		1647	1647	0
796	noordmunster		1647	1648	0
797	popkensburg	155	1647	1656	5
798	prinses royaal	575	1647	1666	10
799	siam	6	1647	1655	2
800	tegenepatnam	90	1647	1651	5
801	batavia, klein	20	1648	1660	3
802	concordia	120	1648	1660	5
803	diamant	550	1648	1652	10
804	hoop		1648	1648	0
805	jamby		1648	1648	0
806	oranjeboom	10	1648	1653	2
807	pelikaan, vergulde	150	1648	1660	4
808	reiger	280	1648	1653	6
809	solor	10	1648	1656	2
810	sperwer	270	1648	1654	7

ID	*Name*	*Last*	*Year in*	*Year out*	*Rate*
811	trouw	250	1648	1659	6
812	visiagapatam	50	1648	1649	3
813	alkmaar	40	1649	1661	2
814	brak		1649	1649	0
815	lastdrager	320	1649	1653	6
816	medemblik	25	1649	1653	2
817	paliacatte	60	1649	1659	3
818	potvis	150	1649	1650	4
819	queda	60	1649	1650	3
820	robijn	240	1649	1653	7
821	velzen		1649	1651	0
822	waterhond		1649	1649	0
823	amsterdam	60	1650	1657	2
824	candia		1650	1650	0
825	mature		1650	1650	0
826	morgenster	180	1650	1653	6
827	rhijnocer	140	1650	1659	5
828	safier	110	1650	1665	5
829	smient	200	1650	1654	6
830	taiwan	150	1650	1654	5
831	troostenburgh	30	1650	1653	3
832	wapen van gale	50	1650	1651	0
833	alkmaar		1651	1651	0
834	batavia	14	1651	1652	2
835	formosa, ilha	30	1651	1654	2
836	hoop, goede	30	1651	1659	3
837	hoorn	110	1651	1661	5
838	jager	6	1649	1651	2
839	katwijk		1651	1651	0
840	lam	40	1651	1657	3
841	malakka	10	1651	1653	2
842	parel	575	1651	1669	10
843	perach		1651	1652	0
844	prins willem	600	1651	1661	10
845	charlois	50	1652	1664	2
846	goa	150	1652	1655	5
847	haas	100	1652	1661	5
848	hoop, goede	30	1652	1654	2
849	jaffenapatnam	40	1652	1654	3
850	joan baptist	180	1652	1653	7
851	kat	85	1652	1661	5
852	katwijk	25	1652	1653	2
853	leeuw, rode	110	1652	1665	5
854	muiden	200	1652	1675	7
855	nasaret	80	1652	1655	5
856	onrust	30	1652	1655	2
857	schelvis	100	1652	1661	5
858	schevelingen	25	1652	1653	2
859	tortelduif	100	1652	1661	5
860	vleermuis, gulden	75	1652	1655	5
861	vos, rode	30	1652	1664	2
862	vos, zwarte	30	1652	1656	2

ID	*Name*	*Last*	*Year in*	*Year out*	*Rate*
863	wapen van batavia	170	1652	1653	7
864	weesp	280	1652	1661	7
865	windhond, witte	100	1652	1658	5
866	abcoude	12	1653	1653	2
867	amboina	10	1653	1653	2
868	amsterdam	10	1653	1657	2
869	arnemuiden	170	1653	1667	7
870	avenhorn	120	1653	1662	5
871	avondster	250	1653	1659	7
872	cabo jaques	100	1653	1661	5
873	ceylon	50	1653	1653	3
874	cotchin	180	1652	1658	7
875	dordrecht	400	1653	1661	10
876	draak, vergulde	220	1653	1656	7
877	duif, engelse	60	1653	1659	3
878	erasmus	200	1653	1661	7
879	formosa	20	1651	1653	2
880	haan		1653	1653	0
881	jacatra		1653	1653	0
882	kabeljauw	100	1653	1661	5
883	kalf, witte	160	1653	1660	5
884	lam, witte	200	1653	1654	6
885	larentucque	28	1652	1653	2
886	leeuw, gekroonde	600	1653	1662	10
887	leeuwin	200	1653	1664	7
888	maagd van dordt	10	1653	1655	2
889	naarden	200	1653	1666	7
890	phoenix	400	1653	1665	10
891	tulp	25	1653	1655	2
892	utrecht	150	1653	1654	5
893	veere	160	1653	1664	5
894	zierikzee	200	1653	1669	7
895	zijdeworm	75	1653	1654	5
896	anjelier	200	1654	1661	7
897	bimmelepatnam		1654	1654	0
898	bloemendaal	100	1654	1666	5
899	boterbloem	40	1654	1660	2
900	brouwershaven	190	1654	1661	7
901	bul, zwarte	250	1654	1659	7
902	diamant		1654	1654	0
903	dolfijn	270	1654	1663	7
904	domburg	120	1654	1660	5
905	ekster	12	1654	1661	2
906	gideon		1654	1655	0
907	goudsbloem	270	1654	1665	7
908	hoop, goede	50	1654	1654	3
909	kaapvogel	30	1654	1656	3
910	konijn	100	1654	1657	5
911	koudekerke	100	1654	1661	5
912	lelie	30	1654	1654	0
913	maagd van enkhuizen	160	1654	1655	5
914	mars	200	1654	1661	7

ID	*Name*	*Last*	*Year in*	*Year out*	*Rate*
915	molucko	40	1654	1659	2
916	negombo		1654	1654	0
917	prins te paard, jonge		1654	1655	0
918	roos	30	1654	1654	0
919	terschelling	260	1654	1661	7
920	tholen	180	1654	1672	7
921	vlieland	200	1654	1668	7
922	vlissingen	215	1654	1665	7
923	waijpouty	25	1654	1658	2
924	wapen van amsterdam	500	1654	1667	10
925	wapen van holland	500	1654	1662	10
926	zeelandia	50	1654	1656	2
927	zoutelande	110	1654	1660	5
928	achilles	240	1655	1661	7
929	amersfoort	500	1655	1675?	10
930	appelboom	40	1655	1666	2
931	arnhem	500	1655	1662	10
932	brak		1655	1655	0
933	breukelen	70	1655	1670	4
934	flora		1655	1655	0
935	fortuin		1655	1656	0
936	geldria	50	1655	1661	3
937	goes	250	1655	1661	7
938	hector	270	1655	1661	7
939	hercules	270	1655	1661	7
940	hoorn	10	1655	1656	2
941	jager	40	1655	1655	2
942	jamby		1655	1655	0
943	maarssen	80	1655	1656	5
944	nachtglas	50	1655	1664	2
945	slot van honingen	500	1655	1661	10
946	spreeuw		1655	1655	0
947	timor		1655	1655	0
948	vink		1655	1655	0
949	workum	180	1655	1660	7
950	zeehond	100	1655	1668	5
951	zeepaard	200	1655	1661	7
952	zwaluw	25	1655	1655	2
	damme	15	1656	1659	2
953					
954	draak		1656	1656	0
955	emmeloord	45	1656	1663	2
956	ens	50	1656	1662	2
957	garnaal		1656	1656	0
958	geep		1656	1656	0
959	hilversum	80	1656	1673	4
960	kreeft	25	1656	1661	2
961	mature	40	1656	1657	3
962	molen	75	1656	1658	4
963	ooievaar	280	1656	1661	6
964	schidpad		1656	1656	0
965	schol	60	1656	1657	0

ID	*Name*	*Last*	*Year in*	*Year out*	*Rate*
966	taiwan	30	1656	1661	2
967	ulysses	280	1656	1665	6
968	urk	50	1656	1661	2
969	venenburg	280	1656	1661	6
970	vink	80	1656	1669	4
971	vogelzang	280	1656	1661	6
972	wachter	75	1656	1658	4
973	wakende boei	70	1656	1666	4
974	zeeridder	70	1656	1669	4
975	amsterdam, klein	40	1657	1661	3
976	arke noë		1657	1657	0
977	caliture	30	1657	1657	3
978	cruz, st		1657	1657	0
979	elburg	170	1657	1661	6
980	formosa	30	1657	1657	2
981	geelmuiden	90	1657	1659	4
982	hasselt	140	1657	1666	5
983	hert, vliegende	10	1657	1659	2
984	hiettoe		1657	1659	0
985	jacatra	100	1657	1658	5
986	japara		1657	1657	0
987	japara	10	1657	1660	2
988	kaneelschiller	80	1657	1658	5
989	krab	40	1657	1657	2
990	leeuwin		1657	1657	0
991	lootsboot, grote		1657	1657	0
992	lootsboot, kleine	20	1657	1657	2
993	mannaar	50	1657	1659	3
994	maria	60	1657	1669	3
995	massulipatnam	40	1657	1657	2
996	mees	90	1657	1673	4
997	mozambique	50	1657	1658	3
998	narsepouer	40	1657	1659	2
999	otter		1657	1657	0
1000	ouglij	40	1657	1657	2
1001	patientie	15	1657	1657	0
1002	postillion	50	1657	1661	2
1003	romain	30	1657	1661	3
1004	sillida		1657	1657	0
1005	snoek	50	1657	1657	3
1006	spijt den duijvel		1657	1657	0
1007	spreeuw	120	1657	1661	4
1008	waterpas	50	1657	1662	3
1009	zeeblom	35	1657	1661	3
1010	bantam	90	1658	1659	5
1011	breskens		1658	1658	0
1012	colombo		1658	1658	0
1013	goeree	210	1658	1669	6
1014	harp	200	1658	1660	6
1015	hert, rode	180	1658	1661	6
1016	hoogland	90	1658	1673	5
1017	immenhorn	70	1658	1661	4

ID	*Name*	*Last*	*Year in*	*Year out*	*Rate*
1018	jaffenapatnam	40	1658	1658	3
1019	kortenhoef	150	1658	1661	4
1020	leerdam	180	1658	1671	6
1021	loenen	90	1658	1670	4
1022	meliskerke	120	1658	1674	5
1023	morgenster	35	1658	1659	3
1024	negapatnam	40	1658	1658	3
1025	nieuwpoort	180	1658	1661	6
1026	pegu	150	1658	1661	4
1027	pipely	50	1658	1661	3
1028	wapen van batavia	20	1658	1659	2
1029	zuilen	60	1658	1671	2
1030	banjarmassing		1659	1659	0
1031	diemermeer	250	1659	1660	6
1032	ganges	30	1659	1659	2
1033	graveland, 's	160	1659	1663	5
1034	hammenhiel	40	1659	1659	2
1035	jager	40	1659	1659	3
1036	maagd van dordt	20	1659	1659	2
1037	mandarsaha	30	1659	1660	3
1038	nagelboom	300	1659	1660	8
1039	oester		1659	1659	0
1040	palembang	25	1659	1660	2
1041	palliacatte	20	1659	1660	2
1042	terboede	60	1659	1670	2
1043	wapen van colombo	30	1659	1661	2
1044	buienskerke	250	1660	1660	6
1045	coromandel	50	1660	1660	3
1046	maagd van dordt	10	1660	1660	2
1047	nieusolor		1660	1660	0
1048	notenboom	300	1660	1660	8
1049	parkiet	40	1660	1665	2
1050	remedie, hollandse		1660	1660	0
1051	roothaas	35	1660	1661	3
1052	ster van ceylon	50	1660	1661	3
1053	zoon, verloren	200	1660	1660	0
1054	japare	20	1652	1652	2
1055	middelburch	10	1641	1642	2
1056	lintworm		1652	1652	0
1057	bruinvis	7	1624	1624	0
1058	batavia	25	1655	1660	2

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