## V

Verenigde Oost-Indische Compagnie (VOC; United East India Company; Netherlands). The Dutch East India Company, Verenigde Oost-Indische Compagnie (VOC), was a trading and shipping company with statelike authority within its Asian territories; it operated from 1602 to 1799. The company's mapmaking activities can be divided into maritime and land-based. The VOC's maritime mapmaking has been studied extensively, the land-based less so.

In the course of the seventeenth century and most of the eighteenth, the VOC's volume of trade grew almost continuously and with it the number of ships employed. From the outset the VOC provided its ships with manuscript charts, and this practice continued well into the eighteenth century. It was thought that the unauthorized spread of cartographic information would be easier to control if manuscript maps were used rather than printed ones. Until 1700 the number of outward-bound VOC ships sailing from Europe per decade was never more than 235, but in the 1720s it peaked at 382 voyages (Bruijn, Gaastra, and Schöffer 1987, 144). This meant the volume of charts the company had to provide to its fleet increased too. It has been calculated that in the first half of the eighteenth century around seven hundred charts on parchment were delivered to the ships each year (Paesie 2010, 4). However, the number of charts issued to each vessel, and the sea areas they covered, changed little from the seventeenth century until the middle of the eighteenth. The standard inventory of navigational equipment lists ten small-scale charts to sail from the Netherlands to Asia. Large-scale charts were provided only for the stopovers at Cape Town, Sunda Strait, and Batavia (Jakarta) on Java, the final destination on the outward-bound voyage. Günter Schilder and Hans Kok (2010) give an excellent overview of the VOC's maritime cartography in general and describe in detail all known charts on parchment.

The VOC had offices (*kamers*, or chambers) in six cities in the Netherlands. The chartmaker of the Amsterdam chamber had a monopoly on the provision of charts for all the regional chambers. In the second half of the seventeenth century, VOC chambers outside of Amsterdam complained about the high prices charged by the chartmaker, Joan Blaeu. (The Blaeu family was the official VOC chartmaker, 1633–1705, following Hessel Gerritsz., 1617–32.) By 1669 it became clear that the chambers regularly bought material from other unofficial suppliers. In the end, the Zeeland chamber in Middelburg even established its own cartographic office and supplier.

From 1620 a hydrographic office was set up in Batavia to provide the returning fleet with the necessary charts. Soon this office had to provide the ships with a much wider range of charts than its counterparts in the Netherlands, not only for the return voyage but also for routes and harbors across the entire Indian Ocean and western Pacific as far as Japan. In 1664, the company reiterated the responsibilities of the permanent chartmakers in Batavia to collect and compile cartographic information. By 1688 the hydrographic office had a permanent establishment; by 1700 the office employed seven draftsmen, and this number increased to around forty in 1740 (Schilder 1988, 32, 41). These draftsmen in Batavia were quite capable of providing the same quality material as their European counterparts (fig. 940).

After the mid-seventeenth century, the maritime expansion of the VOC in Asia and the western Pacific halted, and voyages of discovery were no longer a priority. Although these voyages yielded geographical knowledge, they provided no opportunity for trade, and the VOC's directors lost interest. From that time on, the VOC concentrated on known and already profitable markets. During the next century and a half there were only a few exceptions. These included the voyage of Willem Hesselsz. de Vlamingh to western Australia in 1696–97 (Schilder 1985) and two expeditions in 1705, following the voyage of William Dampier to Australia and



FIG. 940. PAULUS PAULUSZOON, BAY OF PATSIETAN (PRESENT-DAY TELUK PACITAN, JAVA), 1739. Inset on "Generaale pas caart van de zuyd cust Java, ondersogt in de jaare MDCCXXXIX." Pauluszoon, a Swede by birth, served as head of the VOC chartmaker's office in Batavia from 1736 to 1747. Manuscript on paper, 1:30,000.

Size of the entire original:  $93.5 \times 214.0$  cm; size of inset: ca.  $28.5 \times 37.5$  cm. Licentie CC-BY, Kaartcollectie Binnenland Hingman, Nationaal Archief, The Hague (4.VEL 443).

New Guinea in 1699–1700 and rumors about further British interest in the region (Wichmann 1909, 139–52; Sigmond and Zuiderbaan 1995, 99–112). None of these voyages found anything of commercial interest.

Ship captains were not the only ones who needed accurate cartographic information. VOC directors in the Netherlands felt the need for an overview in a manageable form. In 1659 Blaeu, as official VOC chartmaker, announced he would publish an atlas of maps and charts of VOC territories as part of his *Atlas maior* project. In the end, he was unable to publish the volume because by 1667 the VOC had decided not to cover the costs (Schilder et al. 2006, 11). The material Blaeu had prepared to make a VOC atlas was probably sold to private collectors such as Laurens van der Hem (De Groot 2006, 188–89). The Atlas Blaeu–Van der Hem in the Österreichische Nationalbibliothek, Vienna, now contains some 120 maps, charts, and views and provides a unique and valuable record of the VOC in the mid-seventeenth century (see fig. 489).

In the 1690s the company revived the atlas project in a different form. By this time the VOC archive had a comprehensive collection of charts and maps of its area. However, this material was far from uniform in size and quality and therefore difficult to use. Isaac de Graaf was given the task of compiling a manuscript atlas for the VOC's own use, finishing it around 1700. Although the original atlas was broken up in the nineteenth century and dispersed within the company's archive, surviving inventories have enabled its contents to be reconstructed—175 maps, charts, plans, and views—and a facsimile to be published (Schilder et al. 2006). The company was apparently satisfied with the work. When the last Blaeu, Joan II, retired as the official chartmaker in 1705, De Graaf was appointed as his successor, serving until 1743 (fig. 941).

The VOC kept an eye on the unauthorized spread of cartographic information but did nothing to prevent an extensive literature of travel and geographic descriptions about its territory from being published. Many publishers added views and maps to illustrate their books (fig. 942). This material remains rather understudied, but has a firm foundation in the excellent bibliography by John Landwehr (1991) that lists the illustrations, views, and maps found in these works.

By the middle of the eighteenth century, it became clear that the existing charts needed to be revised. The company abandoned its practice of providing manuscript charts, and a printed sea atlas of the Asian waters was published in 1753. The atlas was prepared under the direction of Jan de Marre, an examiner of navigation officers, and published by Johannes II van Keulen as part six of *De nieuwe groote lichtende zee-fakkel*. (The Van Keulens were official VOC chartmakers, 1743–99.) The atlas contains seventy-five charts on sixty-two plates, many coastal profiles, and a text with sailing directions. It gives an excellent overview of the state of Dutch cartography of Asian waters in the mid-eighteenth century and represents the last real original contribution of the VOC to the cartography of the region.

In the Netherlands the VOC concentrated on maritime mapping, but the increasing territory the company controlled demanded a different approach. In the seventeenth century some land surveying was done by military engineers, mainly for the building of fortifications and some town planning. In the eighteenth century the management of larger areas, especially on Java, Ceylon, and the Cape Colony, required better maps. Local officials of the company in the eighteenth century carried out a number of surveys, and in some cases high-quality maps were produced (Mengerink 1988; Zandvliet 1988).

In the late eighteenth century a real decline set in. The Anglo-Dutch war of 1780–84 effectively stopped Asiatic shipping and trade. The company ran into great financial difficulty and never recovered. There were attempts to improve the quality of surveying by setting up schools on Java, but these efforts had little effect. The Académie de Marine in Batavia (1743–55) was only short-lived and the Marine school in Semerang (1782–1812, 1815–1826) came too late. Only after the demise of the VOC did the latter school manage to play a significant role in surveying and publishing of maps and charts. All surviv-

ing material originating from this school is dated after 1800 (Voskuil 1976, 21–28).

As a result of the French Revolutionary Wars, shipping to and from the Netherlands stopped in 1795, and the VOC formally ceased to exist in December 1799. During the last decades of its existence, mapmaking was not a priority, and the number of company draftsmen and cartographers in Batavia was reduced until only a keeper of the collection remained. The company's assets were taken over by the Dutch state, including the archives with the charts and maps. A significant part is still in the Nationaal Archief, The Hague. An excellent inventory with images and descriptions of all manuscript maps, charts, town plans, views, and topographical drawings over the entire period of the company's existence has been published in seven large volumes (Driessen 2006–10).

## DIEDERICK WILDEMAN

SEE ALSO: Geographical Mapping: Netherlands; Map Trade: Netherlands; Marine Charting: Netherlands; West-Indische Compagnie (WIC; West India Company; Netherlands)

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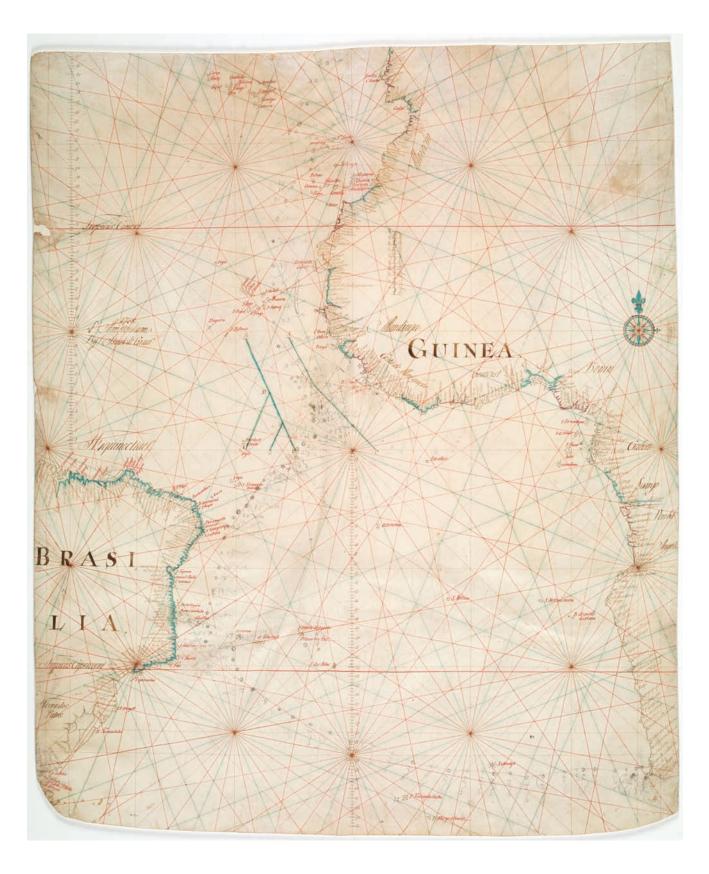




FIG. 942. DE PLATTE GROND VAN AMBOINA, 1718. From François Valentijn, Oud en nieuw Oost-Indiën, 5 vols. (Dordrecht: Joannes van Braam, 1724–26). Based on a manuscript plan by Isaac de Graaf from the 1690s, this printed plan of the Moluccan port of Ambon appeared in what was essentially a history of the VOC. Valentijn was a minister and

naturalist who spent sixteen years in the East Indies, some of them in the employ of the VOC.

Size of the original:  $28 \times 37$  cm. Image courtesy of the Nederlands Scheepvaartmuseum, Amsterdam (B.0032 [109] 6 [kaart 170]).

## (facing page)

FIG. 941. ISAAC DE GRAAF, CHART OF THE SOUTH AT-LANTIC (AMSTERDAM, DRAWN 1738). Manuscript on vellum. The small circles, like beads on a string, represent the daily noon positions of the vessel *Vreeland* on her outward voyage from Enkhuizen in 1745. Coming almost due south along the west coast of Africa, the ship's course falls between two blue lines. These represent the *karrespoor* (literally, cart tracks), a zone that long experience had shown would provide the fastest crossing of the doldrums. The ship then swings toward Brazil to catch the southern westerlies, then heads east to the Cape of Good Hope. Note the sudden, corrective jump to the east just before setting course for the Cape on her track across the Atlantic: this was the result of the *Vreeland* encountering an island whose longitude had been accurately determined; lacking an accurate chronometer, the crew had been relying on dead reckoning.

Size of the original:  $90 \times 73$  cm. Image courtesy of the Nederlands Scheepvaartmuseum, Amsterdam (A.5713).

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Videnskabernes Selskabs kort (Academy of Sciences and Letters map series; Denmark). The first Danish map series based on a systematic triangulation and covering all of Denmark was undertaken by the Kongelige Danske Videnskabernes Selskab, which had been founded in 1742. The academy's members debated several possible projects, including a national survey, but limited funds initially prevented their implementation. A mapping program was eventually initiated in 1761 by Professor Christen Hee with funding from the Crown (Pedersen 1992, 97–98). The project lacked a common title, and its results are generally known today simply as the Videnskabernes Selskab kort (Korsgaard 2004).

The first instructions for the survey explained that its purpose was partly military, in that it was intended to provide information for both the army and navy, and partly scientific, in that it was directed by scientists and was intended to support the "education of competent surveyors and the nation's taste for mathematical sciences" (Lomholt 1961, 17). The project first entailed field surveys at the scale of one thousand alen (ells) to one decimal-tome (inch), or one Danish mile to twelve decimal-tome (i.e., 1:20,000), under the leadership of several senior surveyors, notably Caspar Wessel and Thomas Bugge. Three hundred sixteen konceptkortone (manuscript survey plans) survive today in Rigsarkivet, Copenhagen (fig. 943); they cover 99 percent of the Kingdom of Denmark and the Duchy of Slesvig (German Schleswig) (Korsgaard 2006, 18, 55). The kon*ceptkortone* were then reduced by the senior surveyors,



FIG. 943. DETAIL FROM A KONCEPTKORT FOR THE VIDENSKABERNES SELSKAB KORT. The village of Odder and its environs, in the eastern part of Jylland, from J. Johnson, "Concept-Carte over en part af Øster og Vester Lisbierg Haslef Ning og Hads Herreder udi Calløe Haureballegaards, Aakiær Amter i Iydland," 1777, at 1:20,000, manuscript. In addition to topographical detail, including a hierarchy of settlements and water and wind mills, these plans also delineated the trigonometrical basis of the survey.

Size of the entire original:  $181 \times 162$  cm; size of detail: ca.  $8.5 \times 8.5$  cm. Image courtesy of the Styrelsen for Dataforsyning og Effektivisering, Copenhagen (Koncepter til Videnskabernes Selskabs kort [1757–1820], Pakkenr. 16, map 1m).



FIG. 944. DETAIL FROM A SHEET OF THE PUBLISHED VIDENSKABERNES SELSKAB KORT. The village of Odder and its environs, in the eastern part of Jylland, from O. Warberg, Kort over Haureballegaards Stiernholms Aakier og Skanderborg samt Stykker af Silkeborg og Koldinghuus Amter, engraved by Theodore Gottfried Nicolai Angelo (Copenhagen: Kongelige Danske Videnskabernes Selskab, 1787), at 1:120,000.

Size of the entire original:  $47 \times 83$  cm; size of detail: ca.  $8.5 \times 8.5$  cm. Image courtesy of Det Kgl. Bibliotek; The Royal Danish Library, Copenhagen (KBK 1111-0-1766/10,1–10,6).

most to 1:120,000, for publication (fig. 944). Only the printed maps have indications of latitude and longitude, shown with marginal gradations in degrees and five-minute intervals. Longitude was reckoned from the local Danish meridian, defined as that passing through the observatory in Copenhagen's Rundetaarn. The geometry of the *konceptkortone* and printed plans were mostly internally consistent, although there was some variability in accuracy between the survey maps; when georeferenced, the printed maps consistently shift by one hundred meters, suggesting a systematic error in the original geographical coordinates (Dam 2003–5, 43).

The field surveys began with Copenhagen followed by the rest of Sjæland (Zealand), where mapping was completed by 1772. They then continued westward, so that the isle of Fyn (Funen) and the eastern part of Jylland (Jutland) were completed by 1790. The remaining parts of present-day Denmark-the western part of Jylland and the isle of Bornholm-were surveyed and the reduced maps prepared by 1805. The reduced maps were published between 1766 and 1806, sixteen at 1:120,000 with a few islands at larger scales, such as Bornholm at 1:60,000; the Videnskabernes Selskab also published a general map of Jylland at 1:360,000 in 1820. A final map at 1:120,000, covering the southern part of Slesvig, was published in 1825, when responsibility for systematic surveys was transferred from the academy to the military. However, the academy continued to work with the survey materials until 1841, when it published a general map of Denmark and Slesvig (Nørlund 1943, 58-64; Lomholt 1961, 128-37).

There was significant variation in the content of the konceptkortone over time. The earlier survey plans and printed maps show only coastlines, villages and single farmsteads, larger roads and streams, and forests and wooded areas, as well as occasional prominent landscape elements. In particular, the Crown's involvement in the project meant that the first konceptkortone emphasized the royal estates and the royal hunting grounds. However, this emphasis is absent from later plans, even as the academy increasingly sought to present a comprehensive image of the landscape to meet the needs of the army and land economists. The later plans thus typically also show minor roads and infrastructure as well as several categories of wetland and other landscape features. Significantly, no attempt was made to measure topography; only the steepest hills were coarsely sketched, both on the konceptkortone and printed maps (Dam and Jakobsen 2008, 76-81). One key result of this omission was that the navy and army both preferred to use their own maps rather than those published by the academy, even as the military derived their maps in part by improving upon the academy's original survey plans.

Because the *konceptkortone* are the only map series

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of their kind that were produced before 1800, when wholesale agricultural reforms fundamentally altered the Danish landscape, environmental historians have had to make adjustments for their inevitable inaccuracies in using both the manuscript and printed maps as primary source materials. The printed maps for all of present-day Denmark were scanned, georeferenced, and vectorized from 1997 to 2002 and have since been often used in nationwide and larger regional historical studies. The original survey plans have more detailed information, of course, but because their content was not standardized, they are now mainly used in local studies (Korsgaard 2004).

PEDER DAM

SEE ALSO: Bugge, Thomas; Geodetic Surveying: Denmark and Norway; Geographical Mapping: Denmark and Norway, with Topographical Mapping

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Vischer, Georg Matthäus. Georg Matthäus (Matthias) Vischer was born on 22 April 1628 in Wenns, Tyrol, the son of a farmer. After elementary schooling in Stams and fighting in the Thirty Years' War, Vischer began the study of theology, although it is unknown at which university he enrolled. From 1654, he worked as a chaplain in various Upper Austrian settlements. From 1666 to 1668, he was a priest in Leonstein. In 1668, Vischer, who had shown interest in maps since the Thirty Years' War, renounced his parish in favor of extensive mapmaking activity. In 1667, he obtained a commission from the Upper Austrian Estates to create a map of Upper Austria, which was printed two years later: Archiducatus Austriæ superioris geographica descriptio, engraved by Melchior Küsell. Recommended to the imperial court in Vienna as well as to the Lower Austrian and Styrian Estates, Vischer produced maps of Lower Austria and Styria: Archiducatus

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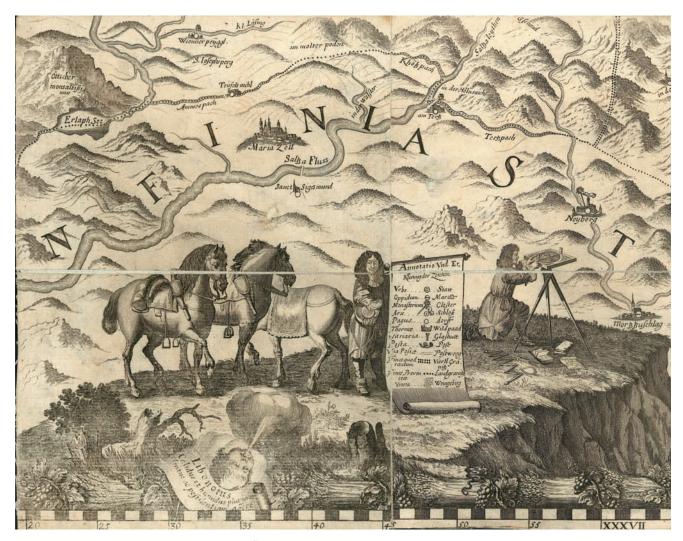


FIG. 945. DETAIL FROM GEORG MATTHÄUS VISCHER, ARCHIDUCATUS AUSTRIÆ INFERIORIS ACCURATIS-SIMA GEOGRAPHICA DESCRIPTIO (AUGSBURG, 1670). Copper engraving on sixteen sheets; ca. 1:144,000.

Size of the entire original:  $118.5 \times 174.0$  cm; size of detail: ca. 29.0  $\times$  37.5 cm. Image courtesy of the Woldan Collection, Österreichische Akademie der Wissenschaften, Vienna (Sammlung Woldan, K-III: OE/Inf. 36).

Austriæ inferioris accuratissima geographica descriptio, 1670, engraved by Melchior Küsell, and Stÿriæ ducatus fertilissimi nova geographica descriptio, 1678, engraved by Andreas Trost. Financial problems forced Vischer to accept various commissions for work, such as preparing numerous maps and views of cities, in addition to teaching mathematics in Vienna. A few months before his death, he finally found permanent employment at Kremsmünster Monastery. Vischer died on 13 December 1696 in Linz (König 1986; Riegler 2004, 20–36).

Vischer may be regarded as the first Austrian cartographer who produced maps based on surveys, a characteristic of later Enlightenment cartography. Moreover, he developed new ideas for map design and the wide range of details included on maps. The decoration on his map of Lower Austria (1670) includes a depiction of the working tools available to him: a plane table with compass and alidade, dividers, callipers, a graphomètre, and a surveyor's chain (fig. 945). However, it is unlikely that he was able to measure the entire area covered by the three maps with a plane table since his on-site surveying lasted only one summer for each area. The decoration supports the idea that, at least in the compilation of the map of Lower Austria, he was aided by a small number of assistants. However, his astronomically determined positions certainly allowed him to correct old data. For example, his coordinates for towns in Styria are significantly more accurate than those featured in Johannes Kepler's *Tabulae Rudolphinae* of 1627 (Wawrik 2004, 59). Vischer's maps are impressive visually because of their high baroque decoration. For example, the map of Lower Austria shows part of the imperial palace in Vienna with two portrait medallions of Emperor Leopold I and his wife Margarita Theresa, a view of the Danube near Vienna, and several coats of arms. The most distinctive decorative feature of the map of Styria is its allegory of natural and economic products. Sustained demand caused Vischer's maps to be reprinted several times after his death. His more than 1,200 views of settlements, monasteries, palaces, and castles are of historic and archaeological value as evidence of urban changes that occurred during the late seventeenth century in the wake of the second Turkish siege (1683) (Wagner 1977, 24, pls. 38–40; Wawrik 2004, 59).

## PETRA SVATEK

SEE ALSO: Austrian Monarchy; Geographical Mapping: Enlightenment BIBLIOGRAPHY

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**VOC.** See Verenigde Oost-Indische Compagnie (VOC; United East India Company; Netherlands)

*Voyages, Apocryphal.* See Imaginary Geographies and Apocryphal Voyages