

46 • Mapping the Dutch World Overseas in the Seventeenth Century

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In 1602, the Verenigde Oostindische Compagnie (VOC, or Dutch East India Company) was chartered by the States General of the Netherlands (the state assembly) to conduct a monopoly in trade east of the Cape of Good Hope and west of the Strait of Magellan. Seventeen years later, in 1619, the Company acquired a privilege from the States General relating to maps.¹ The privilege stipulated that to publish any geographical information about the chartered area of the Company, the express permission of the board of directors of the Company, the Heren XVII (the seventeen gentlemen), was required. In their request for this privilege, the directors emphasized the importance of the geographical knowledge acquired by the VOC's employees on a daily basis: to map seas, straits, and coastlines and to compile treatises on the areas with which the VOC traded. Their maps and reports were used by specialized VOC personnel at headquarters in Batavia to make general maps and instructions. An official VOC mapmaker, helped by assistants, updated and corrected the Company's maps in Amsterdam.

This same interest in maps was shared by the VOC's Atlantic counterpart, the West India Company (WIC), which was founded in 1621 to control trade in the West African and American coastal lands. Shortly after its founding it bought all the maps from the estate of the deceased "founding father" of Dutch overseas cartography, Petrus Plancius, who had had access to navigational information and charts of the Portuguese operating in this area.

Between 1602 and 1795, when these chartered companies existed, hundreds of mapmakers produced topographical maps of Dutch overseas territories and charts for navigating to and from them. Some mapmakers were based in the Netherlands, while others worked in the overseas territories.

This chapter analyzes the role of maps and mapmakers of the VOC and WIC during the first century of Dutch overseas expansion, a subject that has been researched since the nineteenth century. The earliest studies originate from a revival of antiquarian and archival interest in the history of the Dutch Republic in the seventeenth century, for which old maps and views were considered important images. The consummate study of Dutch cartography in relation to Dutch expansion overseas was published between 1925 and 1933 by Frederik Caspar Wieder. His

Monumenta Cartographica intended to demonstrate, through reproduction and description of the most important maps manufactured by the Dutch, the role these maps played in exploration.² Therefore it concentrates primarily on maps from the period of the great Dutch voyages of discovery in the first half of the seventeenth century. This work made the manuscript maps and plans in the atlas of the collector Laurens van der Hem and the important watercolors of Joannes Vingboons available to a much wider audience. Interest in maps and charts related to maritime history, the history of discoveries, and bibliographical history remains strong, as is clear from more recent studies by such scholars as Keuning, Koeman, and Schilder.³ Study of the cartography of the Companies has often been limited to the production of maritime charts; little research has been devoted to overseas town plans, land surveys, and military maps.⁴

Abbreviations used in this chapter include: NA for Nationaal Archief, The Hague.

1. NA, Archief Staten-Generaal inv. nr. 12302, *Akteboeken 1617–1623*, fol. 104v, 12 February 1619.

2. F. C. Wieder, ed., *Monumenta Cartographica: Reproductions of Unique and Rare Maps, Plans and Views in the Actual Size of the Originals*, 5 vols. (The Hague: Martinus Nijhoff, 1925–33).

3. For example, Johannes Keuning, *Petrus Plancius, theoloog en geograaf, 1552–1622* (Amsterdam: Van Kampen, 1946); idem, "Hessel Gerritsz.," *Imago Mundi* 6 (1949): 48–66; C. Koeman, *Atlantes Neerlandici: Bibliography of Terrestrial, Maritime and Celestial Atlases and Pilot Books, Published in the Netherlands up to 1880*, 6 vols. (Amsterdam: Theatrum Orbis Terrarum, 1967–85); idem, "The Dutch West India Company and the Charting of the Coasts of the Americas," in *Vice-Almirante A. Teixeira da Mota in memoriam*, 2 vols. (Lisbon: Academia de Marinha, Instituto de Investigação Científica Tropical, 1987–89), 1: 305–17; C. Koeman, ed., *Links with the Past: The History of the Cartography of Suriname, 1500–1971* (Amsterdam: Theatrum Orbis Terrarum, 1973); Günter Schilder, *Monumenta cartographica Neerlandica* (Alphen aan den Rijn: Canaletto, 1986–); idem, "Organization and Evolution of the Dutch East India Company's Hydrographic Office in the Seventeenth Century," *Imago Mundi* 28 (1976): 61–78; idem, *Australia Unveiled: The Share of the Dutch Navigators in the Discovery of Australia*, trans. Olaf Richter (Amsterdam: Theatrum Orbis Terrarum, 1976); and idem, "De Noordhollandse cartografenschol," in *Lucas Jansz. Waghenaeer van Enckhuysen: De maritieme cartografie in de Nederlanden in de zestiende en het begin van de zeventiende eeuw* (Enkhuizen: Vereniging "Vrienden van het Zuiderzeemuseum," 1984), 47–72.

4. This chapter is based on my research and publication *Mapping for Money: Maps, Plans, and Topographic Paintings and Their Role in*

THE HISTORICAL BACKGROUND OF VOC AND WIC MAPMAKING

The cartography of the Dutch world overseas did not operate in a vacuum, nor did it start with a blank sheet. Spanish and Portuguese overseas expansion, and their organization of cartography, directly or indirectly influenced Dutch activity in profound ways.

In Portugal and Spain overseas expansion was controlled by the Crown. Government institutions, such as the *Armazém da Guiné e Índia* and the *Casa de la Contratación*, played a central role. The production of maps and charts was directed by high government officials. In Portugal the *cosmógrafo-mor* directed all cartographic information activities, including the work of pilots overseas and mapmakers in Lisbon. In addition to Lisbon, Goa developed into a center for overseas cartography in the sixteenth century, and military engineers as well as architects and hydrographers were based there. The situation in Spain was similar in many ways to that in Portugal.

An impression of maps produced within a closed, office environment tends to arise from most literature on the subject. However it is clear that mapmaking in Spain and Portugal was not controlled completely by the government. Mapmakers were not salaried officials but instead worked as more or less independent craftsmen. Between northwestern Europe and the Iberian peninsula the exchange of cartographic knowledge and of information about the organization of cartographic activities was relatively open. Dutchmen, such as Jan Huygen van Linschoten, working for the Portuguese on the Iberian peninsula or overseas had opportunities to acquire cartographic information. Flemish mapmakers, such as Abraham Ortelius and Gerardus Mercator, were in an especially advantageous position—not only did they have their own contacts with English and Iberian cartographers, but the Habsburg court supported their efforts to produce superior globes and printed maps.

When the Antwerp merchant Gilles (Egidius) Hooftman began overseas expeditions in the 1570s, he implemented various Iberian cartographic practices to his benefit. He took measures for training navigators, collected maps with the help of Ortelius, and instructed his pilots to collect cartographic information during their voyages. Iberian institutions were a model for some of the main actors in the Low Countries. One consequence was that although voyages were initiated by many different companies and merchants, for a short time Plancius fulfilled a role in the Netherlands comparable to that of the *cosmógrafo-mor* in Portugal.

In the 1580s and early 1590s, overseas voyages were organized from ports in the northern Netherlands, and merchants and mapmakers built on the practices developed in Flanders. This was possible partly because in cartographic terms the border between the Habsburg Empire

and the Dutch Republic remained open. Cornelis Claesz., the most prominent publisher and seller of maps, with Ortelius's successor Joan Baptista Vrients as a business partner in Antwerp, could help both the interested public and practical businessmen and pilots with the maps and charts they required.

During the late sixteenth century, the production of maps and charts remained in the private sector. An early center for the production of charts was Edam, the hometown of many oceanic navigators. Already in the 1590s, mapmakers in Edam sold their charts through Claesz.'s store in Amsterdam. When the different companies engaged in trade with Asia merged into the VOC in 1602, Amsterdam became the center for producing, printing, and selling maps and charts. Augustijn Robaert, a prominent supplier of maps and charts before and after 1602, moved from Edam to Amsterdam. Many other prominent figures in navigation and cartography, including Jodocus Hondius the Elder and the English mapmakers and engravers Gabriel Tatton and Benjamin Wright, were also drawn to the Republic and especially Amsterdam.

THE EDUCATION AND STATUS OF OCEANIC NAVIGATORS, LAND SURVEYORS, AND MILITARY ENGINEERS

The education of oceanic navigators for the Companies was fairly standardized after 1600. Candidates could go to schools, learn from standard textbooks, and take an examination before they entered the service of the VOC and, after 1621, the WIC. Originally, such training schools were only in Amsterdam (1586) and Flushing (before 1609). After 1610, private schools existed in the major ports of Holland and Zeeland, where pilots were trained. A number of these schools were run by experienced navigators, most of whom were involved with the

Dutch Overseas Expansion during the 16th and 17th Centuries (Amsterdam: Batavian Lion International, 1998; reprinted 2002), to which the reader is referred for more detailed information. From 1998 to 2002, a few studies have been published that should be mentioned, especially those on the subject of town planning and the construction of military works: Ron van Oers, *Dutch Town Planning Overseas During VOC and WIC Rule (1600–1800)* (Zutphen: Walburg Pers, 2000); C. L. Temminck Groll and W. van Alphen, *The Dutch Overseas: Architectural Survey, Mutual Heritage of Four Centuries in Three Continents* (Zwolle: Waanders, 2002); Frans Westra, "Lost and Found: Crijn Fredericx—A New York Founder," *De Halve Maen* 71 (1998): 7–16; and K. Zandvliet, "Vestingbouw in de Oost," in *De Verenigde Oost-Indische Compagnie: Tussen oorlog en diplomatie*, ed. Gerrit Knaap and Ger Teitler (Leiden: KITLV Uitgeverij, 2002), 151–80.

On the ideological aspects of maps of the Dutch world overseas, see Benjamin Schmidt, "Mapping an Empire: Cartographic and Colonial Rivalry in Seventeenth-Century Dutch and English North America," *William and Mary Quarterly*, 3d ser., 54 (1997): 549–78, and idem, *Innocence Abroad: The Dutch Imagination and the New World, 1570–1670* (Cambridge: Cambridge University Press, 2001).

Companies as pilots, examiners of Company pilots, map-makers, or military engineers. The theoretical training in the schools was complemented by practical training with professional pilots.

The foundation of the Duytsche Mathematicque at the University of Leiden in 1600 was an important step toward the institutionalized training of land surveyors and military engineers.⁵ This school's curriculum, designed by the famous mathematician Simon Stevin, a favorite of Maurits van Nassau, prince of Orange, consisted of the following topics: a selection from Euclid's *Elements*, basic constructions with ruler and compass, constructions called "transformation of figures," trigonometry as applied to the "practice of surveying" and the geometry of solids (especially how to calculate volumes), and the art of fortification.⁶ Lessons were not given in Latin, the language of universities, but in Dutch. The coursework was not directed to scientific training and study, but to the practical application of scientific knowledge. In this respect the Duytsche Mathematicque may have been inspired by the Spanish Academia de Matemáticas, which was founded in 1582 by Philip II. This academy, in which courses were taught by royal cosmographers, architects, military engineers, and cartographers, was created to provide the court with educated practitioners in the mathematical sciences and to educate the courtiers themselves.⁷

The Dutch Republic thus had many qualified candidates for professions requiring the mathematical sciences. Consequently, for work overseas, the Companies did not depend solely upon surveyors and engineers imported from Europe. When more than one surveyor was required, the assistant could be trained by his superior, and examples of such apprenticeships are found in Taiwan, in Batavia, and especially in Ceylon.⁸

The status and income of these mathematical professionals was not very high, but it was higher than that of craftsmen. The same status can be observed for surveyors overseas. In 1707 (but also relevant to seventeenth-century practices), the VOC reserved the first three ranks of its personnel for the Governor General, the Director General, and the nine members of the Council of the Indies. Among the thirty-four persons of the fourth rank were the *equipagemeester* (director of the wharf, supervisor of chartmakers) and the *fabriek* (administrator of craftsmen and slaves), who directed the work of chartmakers and land surveyors, respectively. Among the thirty-two persons of the fifth rank were the chief chartmaker and the chief land surveyor. These eighty-seven people were in the highest ranks, with 2695 people classified in the lower ranks.⁹

In the seventeenth century, the Dutch education system worked partly to export Dutch engineers active in fortification, city building, and civil engineering to projects in Scandinavia, Germany, Poland, England, and Italy.¹⁰ Engineers and surveyors were also sent to Dutch overseas

territories to design the layout of towns, build fortifications, and organize the territories. Between 1602 and 1700, we know the names of 126 land surveyors and military engineers who worked overseas in the service of the VOC and the WIC; the actual number was probably somewhat higher.¹¹

OVERSEAS SURVEY PRACTICES AND RULES

Because of the VOC's and WIC's administrative and trade monopolies, a greater uniformity regarding surveying rules and procedures was applied in Dutch possessions in America, Africa, and Asia than in the Republic. For instance, one standard measurement was used overseas: the *Rijnlandse roede*, or "Rhineland rod" (377.7 cm). Land surveyors measured distances on the ground with a chain, 5.5 Rhineland rods in length, which soon became a standard measure, and distances were recorded as a certain number of chains. These chains were used when exact field measurements had to be recorded for the purpose of land administration or the construction of public works. (When a map was needed quickly and accuracy was not of great importance, distances were measured in paces.) Accuracy was sought not only in recording land surfaces, but also water depths, as can be seen in navigation man-

5. Johannes Arnoldus van Maanen, *Facets of Seventeenth Century Mathematics in the Netherlands* (Utrecht: Drukkerij Elinkwijk, 1987), 1–41; Frans Westra, *Nederlandse ingenieurs en de fortificatiewerken in het eerste tijdperk van de Tachtigjarige Oorlog, 1573–1604* (Alphen aan den Rijn: Canaletto, 1992); and P. J. van Winter, *Hoger beroeps-onderwijs avant-la-lettre: Bemoeiingen met de vorming van landmeters en ingenieurs bij de Nederlandse universiteiten van de 17e en 18e eeuw* (Amsterdam: Noord-Hollandsche Uitgevers Maatschappij, 1988).

6. Van Maanen, *Seventeenth Century Mathematics*, 16–17.

7. The academy declined after 1600, but the courses were taken over by other institutions, such as the Jesuit Colegio Imperial in Madrid and military schools in various cities; Brigitte Byloos, "Nederlands vernuft in Spaanse dienst: Technologische bijdragen uit de Nederlanden voor het Spaanse Rijk, 1550–1700" (Ph.D. diss., Katholieke Universiteit, Leuven, 1986), 33–35.

8. Zandvliet, *Mapping for Money*, 77 and 273–74.

9. Leiden, Koninklijk Instituut voor Taal-, Land- en Volkenkunde, Collection Van Hoorn H 55.

10. See F. Dekker, *Voortrekkers van Oud Nederland: Uit Nederland's geschiedenis buiten de grenzen* (The Hague: L. J. C. Boucher, 1938); Ed Taverne, *In 't land van belofte: in de Nieuwe stad: Ideaal en werkelijkheid van de stadsuitleg in de Republiek, 1580–1680* (Maarsse: Gary Schwartz, 1978), 81–109; Juliette Roding, *Christiaan IV van Denemarken (1588–1648): Architectuur en stedenbouw van een Luthers vorst* (Alkmaar: Cantina Architectura, 1991); and Lucia Thijssen, *1000 jaar Polen en Nederland* (Zutphen: Walburg Pers, 1992). See also Juliette Roding, "The North Sea Coasts, an Architectural Unity?" in *The North Sea and Culture (1550–1800): Proceedings of the International Conference Held at Leiden, 21–22 April 1995*, ed. Juliette Roding and Lex Heerma van Voss (Hilversum: Verloren, 1996), 96–106, and quote on p. 101: "'Dutch' must have symbolized modern government, modern welfare, modern trade and industry. From Holland [to Denmark] came the many engineers who laid out new towns and fortifications."

11. Zandvliet, *Mapping for Money*, 273–74.

uals. Measurement of topographic relief was important for positioning artillery and planning fortifications. For example, after the capture of the city of Olinda in Brazil, a survey was carried out.

The degree of legal uniformity was also higher overseas than in the Netherlands. The 1642 Batavia law codes (*Bataviasche Statuten*) covered the entire chartered territory of the VOC.¹² Administrators established town planning principles, which included rules prohibiting the construction of alleys and houses that exceeded the specified building line (*rooilijn*).¹³ Use of maps for the systematic inspection of buildings was implied by these rules. In the *Statuten*, instructions were included for the *rooimeester* (building inspector or clerk of the works). Because the work of this clerk was similar to that done by a chartered land surveyor, both tasks were sometimes carried out by one official. Uniformity of practices was also promoted through the control of building activities by directors in the Republic and the overseas government. Before starting any construction, local governors had to send their plans to superiors and specialists both in Batavia and the Republic.

TECHNOCRATS

Land surveyors and engineers acted as land administrators, town builders, and architects. Directors overseas also regarded them as well-trained candidates for higher administrative positions with more responsibility. Because overseas colonies had a great need for administrators with technical abilities, the broad technical training in the Republic could serve partly as preparation for future colonial officials. Such “technocrats” were likely to obtain a higher administrative post overseas than in the Republic. In his 1654 manual on the art of fortification, Hendrick Ruse points to the importance for governors to study the art of fortification and its underlying discipline, geometry.¹⁴ By 1654, Ruse may have had a few prominent overseas governors in mind, such as the former Governor General and mathematician Laurens Reael, as well as two men who had recently returned from service overseas: Johan Maurits van Nassau, the technocratic governor of Dutch Brazil, and Johannes van Walbeeck, prominent mathematician and administrator of Brazil and Curaçao.¹⁵

Although land surveyors and engineers had training that prepared them for higher-paying jobs, factors other than education and salary played a role in the career decisions of these officials. The risk of sickness and death made Dutch surveyors and engineers hesitant to go overseas. However, some welcomed the opportunity to work toward a higher-paying position without doing strenuous work in the field. Numerous surveyors became landowners and/or planters or simply acted as landlords, leaving the heavy work to servants and slaves. Willem Mogge, the

first surveyor of Surinam, owned plantations soon after his arrival in Tobago and Surinam.¹⁶ His colleague in Batavia, Mattheus du Chesne, possessed large plots both within and outside the city.¹⁷

It is clear that the breakthrough in Dutch overseas expansion late in the sixteenth century was accompanied by a well-organized education system. By 1600, there were as many oceanic navigators as were needed in the Netherlands. At the same time, new procedures were introduced that influenced the upkeep of charts. Pilots now began to keep logbooks, including coastal profiles and sketch maps of estuaries and islands, and they produced reconnaissance charts using sheets of paper with pre-drawn compass lines. The same breakthrough in education was true for military engineers and land surveyors. It was relatively easy for the VOC and the WIC to recruit well-trained mathematicians. The government of the overseas territories was organized more rigidly than in the Dutch Republic, which also resulted in more uniformity in survey practices and rules.

THE DUTCH EAST INDIA COMPANY

THE ORGANIZATION OF VOC MAPMAKING IN THE DUTCH REPUBLIC

When the VOC was established in 1602, reliable cartographic information was needed both for the Company’s voyages to Asia and for trade within Asia. By this time, experts in the Republic already had access to navigational

12. J. van Kan, “De Bataviasche statuten en de buitencomptoiren,” *Bijdragen tot de Taal-, Land- en Volkenkunde van Nederlandsch-Indië* 100 (1941): 255–82.

13. Jacobus Anne van der Chijs, *Nederlandsch-Indisch plakaatboek, 1602–1811*, 17 vols. (Batavia: Landsdrukkerij, 1885–1900), 1:561.

14. Hendrik Ruse, *Versterckte vesting: Uytgevonden in velerley voorvallen, en geobserveert in dese laetste oorloogen, soo in de Vereenigde Nederlanden, als in Vranckryck, Duyts-Lant, Italien, Dalmatien, Albanien en die daer aengelegen landen* (Amsterdam: Ioan Blaeu, 1654), introduction.

15. Ruse, the military engineer of the city of Amsterdam from 1652, owed the next step in his career to the patronage of Johan Maurits van Nassau. Friedrich Wilhelm, the Great Elector of Brandenburg, employed Ruse on Johan Maurits’s recommendation. See Taverne, *In ’t land van belofte*, 66, and P. J. Bouman, *Johan Maurits van Nassau, de Braziliaan* (Utrecht: A. Oosthoek, 1947), 117. On his work in Germany, see Ed Taverne, “Henrick Ruse und die ‘Verstärkte Festung’ von Kalkar,” in *Soweit der Erdkreis reicht: Johann Moritz von Nassau-Siegen, 1604–1679*, ed. Guido de Werd, exhibition catalog (Kleve: Das Museum, 1980), 151–58.

16. Jeannette Dora Black’s *Commentary*, vol. 2 of *The Blathwayt Atlas*, by William Blathwayt, 2 vols., ed. Jeannette Dora Black (Providence: Brown University Press, [1970–75]), 205.

17. Bea Brommer and Dirk de Vries, *Batavia*, vol. 4 in *Historische plattegronden van Nederlandse steden* (Alphen aan den Rijn: Canaletto, 1992), 76 and 79. In 1650, he and his wife Sara owned more than fifty-two *morgen* (117 acres) of land outside the city.

information from Portuguese sources. Petrus Plancius, having published the charts of the Portuguese mapmaker Bartolomeu Lasso, had also written several memoranda with navigational directions and had instructed pilots concerning voyages on the high seas. Plancius's position in the Oude Compagnie (the first and most prominent pre-1602 company trading with Asia) resembled the *cosmógrafo-mor* in Portugal, and it may be assumed that the instructions for the *cosmógrafo-mor*, pilots, and mapmakers were well known to Plancius and elite merchants in the Dutch Republic. While these instructions were used to shape the organization of the Oude Compagnie, the Portuguese model was not adopted completely and slowly faded away. By the early seventeenth century, pilots were no longer instructed by a Dutch equivalent to the *cosmógrafo-mor*.

Beginning in 1602, VOC ships were outfitted with navigational instruments, such as compasses, signal flags, quadrants, and prototype charts, delivered by a relatively small number of suppliers. Even though these ships were supplied with Company maps, no formal organization for the production and administration of charts and no salaried mapmakers or examiners of pilots (*examineur der stuurluyden*) existed at first, but within two decades, a new form of institutionalized mapmaking had developed. Crucial steps toward the formal creation of such a mapmaking agency were taken between 1614 and 1619, reflecting VOC policy in those years—the aim of which was military control of vital parts of Asia, both in terms of geographical resources and of crucial commercial and political knowledge.

The Creation of the Amsterdam Mapmaking Agency

New cartographic information came to the Netherlands as a result of the new territory covered by VOC ships, whose pilots were trained and ordered to record their findings in charts and logbooks. This awareness of the importance of maps and charts led Jan Pietersz. Coen (Governor General, 1619–23 and 1627–29) and Hendrik Brouwer (Governor General, 1632–36) to initiate organized mapmaking within the sphere of the VOC.

In June 1616, Brouwer returned home from the East Indies, having been in the East for almost ten years.¹⁸ Back in the Netherlands, he began to play an important role in the organization of VOC mapmaking, formally recognized in the spring of 1617 by his appointment as director of the Amsterdam Chamber. Brouwer had a wealth of experience in maps and map use.¹⁹ In 1611, he had proved himself a master of oceanic navigation. Based on the theory that westerly winds prevailed along the same latitudes in the south as in the north, Brouwer sailed south from the Cape of Good Hope. Once in the zone where the westerlies prevail, he sailed across the Indian Ocean and, by us-

ing this southern route, managed to cut his sailing time by a number of months. From 1616, all VOC ships were instructed to use Brouwer's route.²⁰ Its use also resulted in the discovery of the west coast of Australia.²¹

In 1616, the VOC directors formally began an administrative process to obtain cartographic information to update charts, a routine that changed the position of cartographic specialists. From 1617 one can also speak of a Company mapmaking agency in Amsterdam, and in 1619, Hessel Gerritsz. was sworn in as its official mapmaker with specific instructions, and Cornelis Jansz. Lastman was appointed examiner of pilots. In summary:

The rutter, already begun by him, with all places, regions, islands, and harbors relevant for the Asian navigation, will be produced and improved; all logbooks that he already received and which he will receive from now on through the directors, will have to be stored in the East India House [in Amsterdam]; he will keep a complete catalog of the logbooks, which has to be updated every six months; he will correct the standard charts only after the directors have approved the corrections; on his death his widow or heirs will hand over all the papers in his possession; the directors are allowed to inspect his belongings and request anything they find relevant, without hindrance; all charts for the VOC shall be made at his order by trustworthy per-

18. Information about Brouwer is derived mainly from J. W. IJzerman's contribution to Cornelis Buijsero, *Cornelis Buijsero te Bantam, 1616–1618: Zijn brieven en journaal*, ed. J. W. IJzerman (The Hague: M. Nijhoff, 1923), 174–79, and J. E. Heeres, "De Gouverneur-Generaal Hendrik Brouwer," *Oud-Holland* 25 (1907): 174–96 and 217–41.

19. On 4 May 1612, Brouwer explained the instructions of the Heren XVII of 10 September 1610 with the help of a map of the Banda Islands. In 1612–13, he made the journey to the court of the Shogun, where he presented letters and gifts from Prince Maurits van Nassau. In March 1615, he was present at the reconnaissance of Pulo Ay, then occupied by the English, which was unsuccessfully attacked by the Dutch afterward, and in May 1615, he was sent to build a fortified lodge in Japara on East Java, although this task was not accomplished.

20. The route was described in the *zeymbrief* (sailing order). The earliest one is preserved in manuscript (and in manuscript copies for years after) in the NA, VOC 313, fols. 58–61. Skippers were motivated with bonuses to reduce the sailing time between the Netherlands and Java: those who reached Bantam within seven months received 600 guilders, and for passages of eight months and nine months, the bonuses were 300 and 150 guilders, respectively; NA, VOC 147, resolutions Heren XVII August 1617, point 25.

21. Governor General Reael in Asia supported this approach by sending in July 1616 a large-scale map of the Northern Moluccas to the Netherlands with an explanation of how the navigation route between Gilolo through Strait Bouton to Bantam had been explored. In the same letter, he promised future explorations of Amboina, the Banda Islands, the routes from Bantam to the Southern Moluccas, and the route between the Cape of Good Hope and Terra Australis; see the letter of 18 July 1616 from Reael to the directors in W. Philippus Coolhaas, ed., *Generale missiven van gouverneurs-generaal en raden aan Heren XVII der Verenigde Oostindische Compagnie* (The Hague: Martinus Nijhoff, 1960–), 1:63–67, esp. 65.

sons, as much as possible in his house; no charts should be sent or made outside the city; he will report every six months on the progress of his work; he will publish nothing without the permission of the directors; he should observe secrecy about his work; he will receive a yearly salary of 300 guilders in addition to the payments for the charts themselves.²²

The instructions to Gerritsz. reveal that the East India House was seen as a hydrographical depot, similar to the Portuguese Armazém da Guiné e Índia and the Spanish Casa de la Contratación.

In February 1619, the VOC directors received an open letter of privilege from the States General for all maps, descriptions, and rutters (sailing directions) concerning the VOC's area of control.²³ Earlier privileges (such as Gerritsz.'s) concerning maps and geographical descriptions in relation to the VOC-controlled area were withdrawn. Beginning in 1619, no one was allowed, without the express consent of the directors, to publish or copy maps or descriptions concerning the privileged area. Potential violators were deterred with the extremely high penalty of 6000 guilders. The 1619 wording of the privilege, with its attention to secrecy, is a good indication that a rather liberal exchange of cartographic knowledge existed before 1619.

Why did the Dutch change their attitude toward a free flow of cartographic information in these years? The answer can be found in the overseas situation. Portugal, Spain, England, and the Netherlands were involved in a military struggle for commercial overseas control, and every map was seen as a possible tool for making gains. To obtain a monopoly of cartographic information would certainly help in this struggle.

The change of attitude toward geographical information did not go unnoticed. It was even criticized by some VOC directors, the most outspoken of whom was Aernoud (Aernout) van Buchell, director in the Amsterdam Chamber for the province of Utrecht. Van Buchell was well aware that the Dutch Republic was organized in such a way that secrecy, at least structurally, was difficult to put into practice. (What, he asks, happens if Governor General Reael reports on the state of the Indies in a meeting of the States General? Van Buchell, of course, knew the answer: his report would almost immediately be known to hundreds of interested people in and outside the Dutch Republic.)²⁴

In addition to his work for the VOC, the WIC (beginning in 1621), other companies, and the Admiralty, Gerritsz. engraved and published portraits, allegorical prints, news maps, pamphlets, and numerous maps, sometimes in cooperation with Willem Jansz. Blaeu, in whose workshop he had acquired most of his skills.²⁵ The connection between VOC maps and commercially printed atlas maps needs to be more fully elucidated. Biographers of Gerritsz. do not mention that around 1630, Gerritsz. was engraving

commercial atlas maps of VOC territories.²⁶ It is possible that he was working in close cooperation with Blaeu, who at the time was publishing his first atlas (*Atlantis appendix, sive pars altera, continens tab: Geographicas diversarum orbis regionum*, first edition, 1630) and was in competition with Henricus Hondius and Johannes Janssonius, who were publishing an ever-expanding Mercator atlas.²⁷ The map *India quæ orientalis dicitur et insulæ adiacentes*, in three known states, perfectly illustrates how a VOC chart was turned into a commercial atlas map.²⁸ The first state, which must be the work of Gerritsz., shows little more than coastlines and rivers (fig. 46.1), whereas the third state is embellished with decorative compass roses, ships, and cartouches (fig. 46.2). Through the depiction of mountain ranges, the third state manages to give the impression of being a geographical map, but this is only an illusion—it provides no additional substantive information than the first state.

In the last years of Gerritsz.'s life and shortly after his death, a wealth of cartographic information about the VOC was made available to the general public through the early Blaeu atlases. By 1635, the liberal approach toward cartographic information that had existed in the years before 1619 had been restored.

The Blaeu Family

In 1617, with the political-religious situation unfavorable toward the free-thinking Dutch Reformist Willem Jansz.

22. Pieter van Dam, *Beschryvinge van de Oostindische Compagnie*, 4 vols., ed. Frederik Willem Stapel and Carel Wessel Theodorus Boetzelaer van Dubbeldam (The Hague: Martinus Nijhoff, 1927–54), 1: 414–15.

23. NA, VOC 7344, resolutions Heren XVII 29 January 1619, decision to request such a privilege; NA, SG 4934, incoming letters February 1619, text of the VOC letter with amendments made by a clerk of the States General; and NA, Archief Staten-Generaal inv. nr. 12302, *Akteboeken 1617–1623*, fol. 104v, 12 February 1619, text of the privilege granted at this date. For a transcription of the text, see K. Zandvliet, *De groote waereld in 't kleen geschildert: Nederlandse kartografie tussen de middeleeuwen en de industriële revolutie* (Alphen aan den Rijn: Canaletto, 1985), 177–78.

24. Reael's 1620 report was published by Margot E. van Opstall, ed., *Laurens Reael in de Staten-Generaal: Het verslag van Reael over de toestand in Oost-Indië anno 1620* (The Hague, 1979). See also Aernoud van Buchell, *Diarium van Arend van Buchell*, ed. Gisbert Brom and L. A. van Langeraad (Amsterdam: J. Müller, 1907).

25. Gathered from a legend on his map of Spain (1612); see Keuning, "Hessel Gerritsz.," 51–52.

26. Keuning makes no mention of these maps in his article, "Hessel Gerritsz."

27. In March 1630, Hondius and Janssonius ordered thirty-six new maps to be engraved in the following twenty-one months; see the deed quoted in full in Zandvliet, *De groote waereld*, 179–80. For the atlases, see Koeman, *Atlantes Neerlandici*, vols. 1 and 2.

28. Descriptions and illustrations in Schilder, *Monumenta cartographica Neerlandica*, 4:24–25.

Blaeu, there was no possibility of him becoming the VOC's mapmaker, and his former assistant Gerritsz. was given the job. When Gerritsz. died in 1632, the situation had changed: Calvinist hardliners had been replaced in Amsterdam, and Plancius had died (1622). A more tolerant policy toward non-Calvinists and some freedom of the press ensued.

Blaeu must have felt honored when the VOC asked him to become their mapmaker on the same terms as Gerritsz. He accepted without hesitation and was officially appointed on 3 January 1633; Gerritsz.'s contract was simply copied.²⁹ The continuity of VOC mapmaking was further guaranteed through the stipulation that Blaeu hire Gerritsz.'s four assistants, who also received, through the offices of Laurens Reael (director of the Amsterdam Chamber), all the VOC papers and maps that had come from Gerritsz.'s house.³⁰

Little is known of Blaeu's activities as a VOC mapmaker. No manuscript charts signed by him are known, yet he must have worked constantly on VOC charts. The practice begun with Gerritsz. in the 1620s in which the Amsterdam mapmaker also supplied the charts for the other Chambers of the VOC was continued.³¹ Even the Zeeland Chamber, the one most inclined to do things its own way, ordered charts from Amsterdam.³²

After Blaeu's death in 1638, it was not certain that he would be succeeded by his son Joan. At first the handling of the VOC maps and documents in Willem's house was not even discussed with Joan but with Joan's uncle.³³ But Joan soon offered his services to the VOC and was appointed.³⁴ The papers of his father, along with those of his predecessor Gerritsz., were deposited in the East India House. Joan Blaeu was also instructed to bring his charts, which were copies of the prototypes for use on board ship, to the same East India House on a regular basis. From 1638, therefore, two cartographic collections existed in the East India House: a depot of charts for ships—in the so-called *stuurmanskamer*—and an archival collection of maps and plans. The first collection was actually stock to be distributed to navigation officers on outward-bound ships. This stock was replenished by Blaeu with new manuscript copies of his charts, along with the charts returned by officers who arrived on homeward-bound ships. The assortment and number of charts was recorded regularly.³⁵

The 1647 chart of Sumatra and the Strait of Malacca from Blaeu's workshop shows how copies of the standard or prototype charts, called *leggers*, were made (fig. 46.3).³⁶ A description of the process can be found in the eighteenth-century book by Johann Wolfgang Heydt, who observed how the work was done in the Batavia agency.³⁷

Joan Blaeu was sworn in as the VOC mapmaker before the burgomasters of Amsterdam. His oath required that he be a loyal servant and observe the rule of secrecy, as

had been stipulated in Willem Jansz. Blaeu's and Gerritsz.'s contracts. Rather than being secretive, however, as his contract demanded, Blaeu used the rich cartographic resources constantly pouring in from Asia and South Africa in a variety of his commercial undertakings. The VOC paid him five to nine guilders per chart. On each ship the skipper, the chief pilot, and the junior pilot received a complete set of nine charts for the Amsterdam-Batavia route, while the third watch received a limited set of five charts. Each ship had a total of at least thirty-two charts on parchment, costing the VOC 228 guilders to equip one ship. If the prices of Blaeu's charts are compared with the prices of manuscript charts sold by Cornelis Claesz., we can estimate that the costs to Blaeu were not higher than two guilders per chart. If this was true, then Blaeu made a profit of 164 guilders for each ship fully equipped with charts, excluding the profit he made on the additional maps, manuals, globes, and charts for one ship—a profit margin of more than 70 percent!³⁸

The office of VOC mapmaker was therefore extremely profitable for Blaeu. For the year 1668, he submitted an invoice of 21,135 guilders.³⁹ If we accept his profit mar-

29. NA, VOC 231, resolutions Amsterdam Chamber 30 December 1632 and 3 January 1633.

30. NA, VOC 231, resolutions Amsterdam Chamber 6 February 1634 and 6 March 1634. Because of the large amount of material, the Directors handed everything to Blaeu, cataloged or not.

31. The VOC was organized into regional departments called *Kamers* (Chambers): Zeeland, Rotterdam, Delft, Amsterdam, and Noorderkwartier (Enkhuizen and Hoorn). The departments had their own boards and sent representatives to the general board (the Heren XVII), in which there was a sensitive balance of power. In general the regional departments did many things more or less independently.

32. NA, VOC 7294, 17 October 1636 letter from Zeeland to Amsterdam requesting two chests with navigation instruments, without astrolabes, but including the usual charts. Also, three extra charts for the Indian Ocean and three extra charts of Sumatra and the Strait of Malacca were ordered.

33. NA, VOC 232, resolutions Amsterdam Chamber 4 November 1638.

34. NA, VOC 232, resolutions Amsterdam Chamber 8 November 1638.

35. NA, Hudde 3 (list 50). Hudde in 1683 describes which registers are kept in the different warehouses and wharfs. For the warehouse he mentions "a register in which is noted which goods are bought and to which ships they are sent, except the charts and navigation instruments for which a separate register is kept."

36. In addition to *legger*, the terms *origineele* and *slaper* were used; Van der Chijs, *Nederlandsch-Indisch plakkaatboek*, vol. 6, decree of 15 January 1753.

37. Johann Wolfgang Heydt, *Allerneuester geographisch- und topographischer Schau-Platz von Africa und Ost-Indien* (Willhermsdorf: Gedruckt bey J. C. Tetschner, 1744), 44.

38. Additional maps included the printed charts of the North Sea, the European coasts, Australia, and the large-scale charts of South Africa.

39. NA, VOC 4456, report of the *Haags Besogne*, and 4601, report of the conferences of the Heren XVII committee for inspecting the books, 4 June 1669. The reason for the discussion was the excessive bill that Blaeu presented for the year 1668.

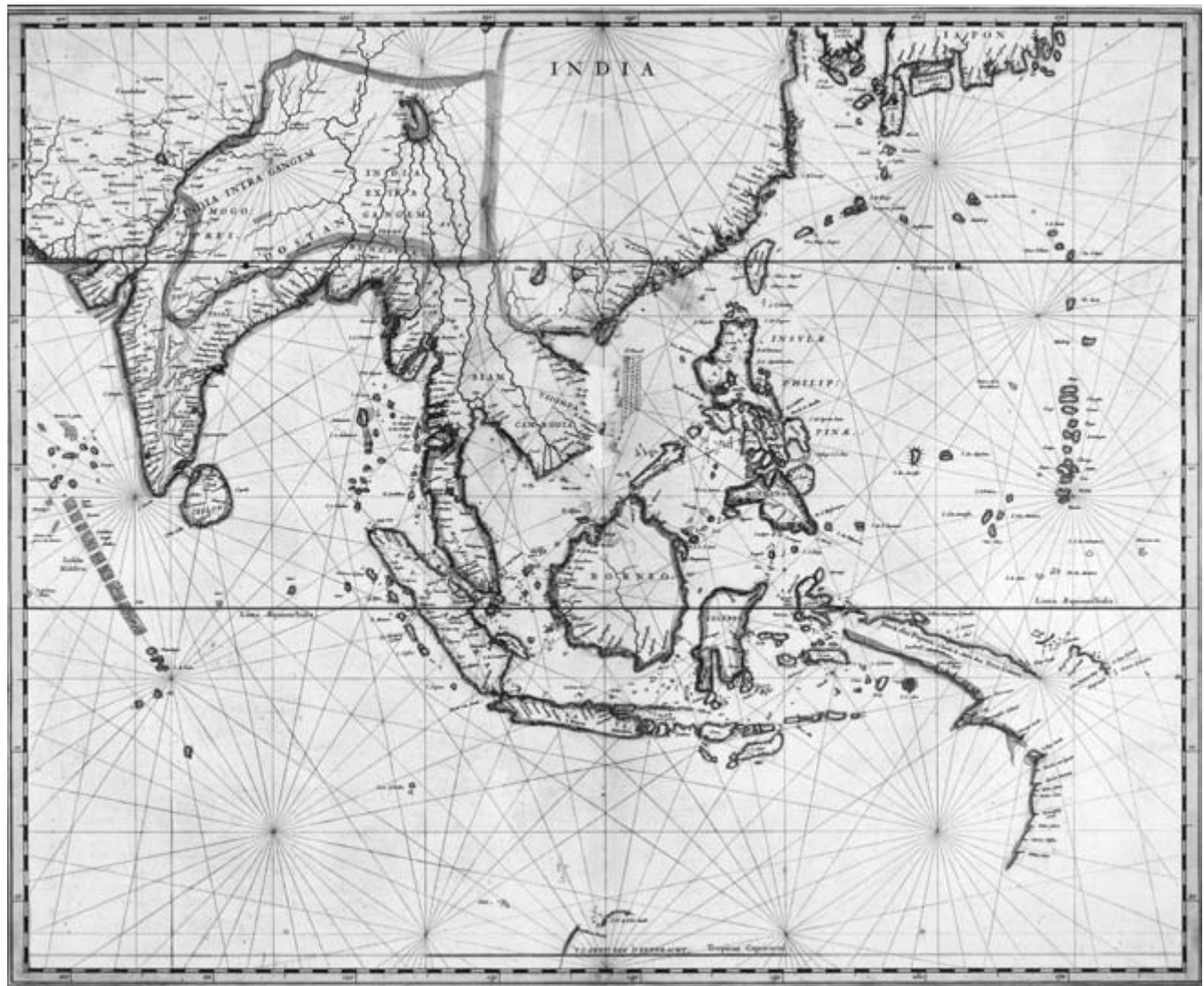


FIG. 46.1. FIRST STATE OF HESSEL GERRITZS.'S MAP OF INDIA AND SOUTHEAST ASIA, MADE IN OR SHORTLY BEFORE 1632. This version of the map was without title or

embellishments.

Size of the original: 42 × 51 cm. Photograph courtesy of the National Library of Australia, Canberra (Map T 221).

gin to be 72 percent, the VOC that year added about 16,000 guilders to Blaeu's profits; the income from the VOC from 1638 to 1673 must have helped finance Blaeu's other undertakings, such as the ambitious and high-risk *Atlas maior*.

The VOC did its best to reduce the number of charts ordered from this very expensive mapmaker, partly by imposing a penalty on navigation officers who did not hand in their charts when they arrived at their port of destination. (In 1620, five to nine guilders were charged for each chart not returned.) In 1655 and 1670, the regulations on this point were tightened: officers had to sign for the charts they received, the lists of charts handed out

were printed, and officers were told that they would have to pay double the price of each chart not returned.⁴⁰

Charts and navigation manuals were not printed until the mid-eighteenth century. That the VOC and Blaeu did not come to an agreement to print charts or navigation manuals may be partly because this would have undermined Blaeu's interests: printed charts would have diverted a major part of his income from standard manu-

40. NA, VOC 345, resolutions Amsterdam Chamber 15 October 1654 following an initial decision of the Heren XVII, 24 September 1654, article 20. See also NA, VOC 221, Heren XVII to Batavia 16 April 1655, 30 August 1670, 5 September 1670, and 24 September 1675.



FIG. 46.2. THIRD STATE OF GERRITZS.'S MAP OF INDIA AND SOUTHEAST ASIA, *INDIA QUÆ ORIENTALIS*. This version, dedicated to Laurens Reael and elaborately decorated with cartouches, titles, compass roses, and ships, was pub-

lished in Blaeu's 1635 atlas.

Size of the original: 42 × 51 cm. Photograph courtesy of the NA (AKF 2).

script charts. Blaeu's status was sufficient to prevent this reproduction of the charts.

Blaeu's principal interest at the time must have been his major cartographic works on Asia and the enlargement of his grandiose *Atlas maior*. For example, the Jesuit scholar Martinus Martini took to Batavia, where it was translated into Dutch, the manuscript atlas of China that he had compiled there using Chinese sources from Beijing. From Batavia, Martini received free passage to the Republic on a VOC ship. In 1655, he met Blaeu in Amsterdam, who was eager to publish Martini's atlas as a new volume in the *Atlas maior*.

Blaeu's most important partner in cartography was Joannes Vingboons, a name associated with a series of about two hundred hand-drawn prototype maps, charts, views, and plans, some of them still bound together in atlases. Because more than one copy of each prototype is usually preserved, well over 450 Vingboons drawings are known. The Vingboons series is of a somewhat hybrid character: copies of printed maps, both old and current, are included,⁴¹ as are miniature copies of paintings and

41. The watercolors of Goa, Angra, and Mozambique (NA, VELH 619, subnrs. 53, 106, and 107) are copies of prints in the *Itinerario* of

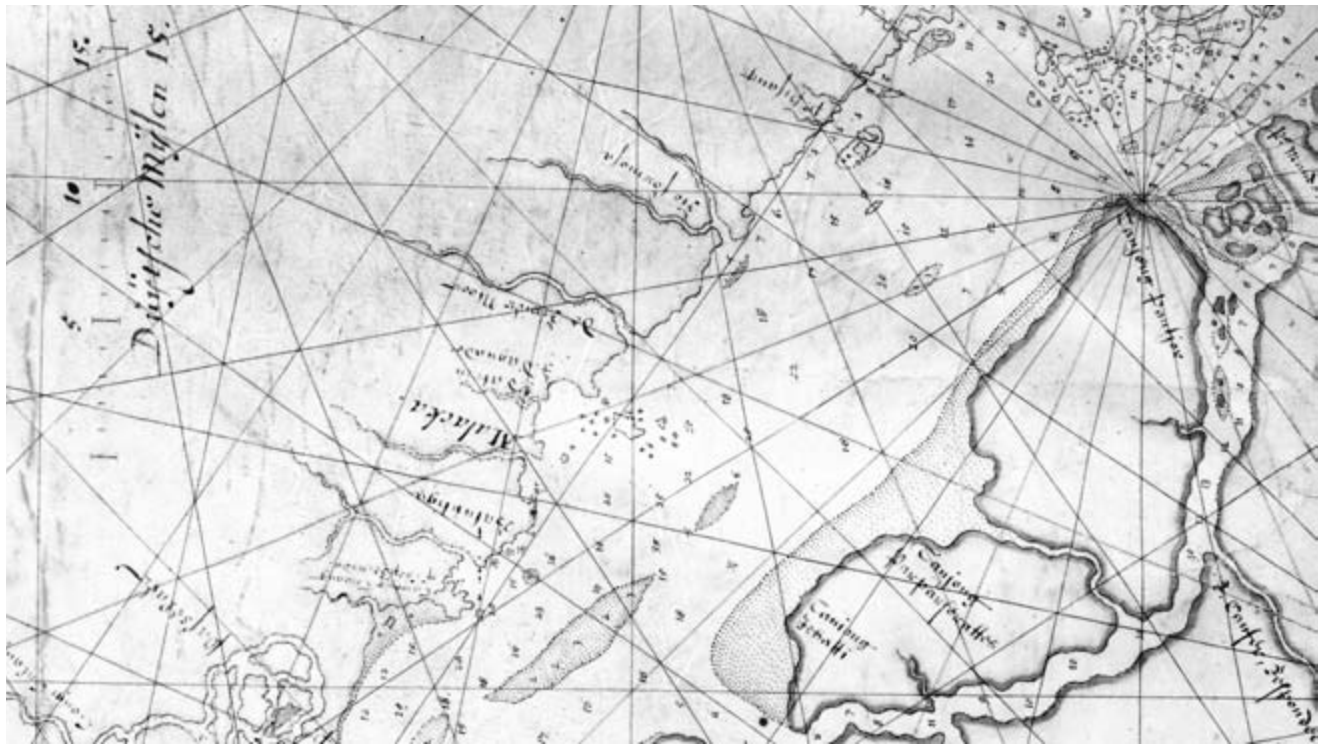


FIG. 46.3. DETAIL OF OFFICIAL VOC CHART OF SUMATRA AND THE STRAIT OF MALACCA, 1647. Map on parchment used in Blaeu's workshop as a model to make new charts. Once the coastlines of the model map were pricked out at regular intervals with a needle, production of new charts was relatively simple. The model map was laid on top of a blank sheet of parchment and the coastlines were dusted with a small bag of soot. The soot, which percolated through the

holes in the model, then yielded a pattern of dots on the blank sheet. After the model map was carefully removed from the parchment, the outlines of the coasts could be drawn in by joining up the specks of soot. Parchment was usually used by the VOC to ensure durability of the charts.

Size of the entire original: 68 × 85 cm. Photograph courtesy of the NA (VELH 163).

copies of original, current WIC and VOC charts and maps. These hybrid atlases are unique compilations by Blaeu and Vingboons for an exclusive market; some of them also served as models for new volumes of the *Atlas maior*.

In the Vingboons brothers (Joannes, Pieter, and Philips), Blaeu had partners who could help him produce aesthetic and monumental cartographic masterpieces, such as giant hand-made globes, wall maps, manuscript atlases, and the models for engravings to appear in volumes of his *Atlas maior*. Blaeu's partnership with the Vingboons family is the key to explaining the nature of the Vingboons atlases as well as the large invoices Blaeu submitted to the VOC. Although the VOC directors complained in the late 1660s about Blaeu's bills and were hesitant about the latter's proposed VOC sea atlas, the directors and Blaeu both still benefited from the arrangement. Blaeu was paid large sums by the VOC for his standard charts, but he was also well compensated for his cartographic masterpieces, used as presents in Europe and Asia, and for the Vingboons drawings and manuscript atlases, which the directors took home for their private use

and enjoyment. So Blaeu's position in relation to the VOC was something of a hybrid—he was an official, yet basically an independent entrepreneur. This approach was not exceptional, as VOC directors combined numerous undertakings within and beyond the Company's sphere.

THE HYDROGRAPHICAL SERVICE IN ASIA

In the late 1610s, the VOC established the fortress of Batavia as the main center of government and trade in Asia. This choice influenced the organization of cartography, beginning with the creation of a hydrographic office and the appointment of Pieter Barendtsz. as *equipage-*

Jan Huygen van Linschoten. Vingboons copied a printed plan of Recife (1648) by Cornelis Bastiaensz. Golyath (Goliath), and copied, among others, numerous prints from the book by Caspar van Baerle on the history of Johan Maurits van Nassau's period in Dutch Brazil (*Casparis Barlaei, rerum per octennium in Brasilia et alibi nuper gestarum*, 1647); J. van Bracht, introduction to the *Atlas van kaarten en aanzichten van de VOC en WIC, genoemd Vingboons-Atlas, in het Algemeen Rijksarchief te 's-Gravenhage* (Haarlem: Fibula-Van Dishoeck, 1981), [5].

meester in 1620.⁴² That same year, pilots and skippers were told that upon their arrival in the East, they were to hand over to Barendsz. all the charts no longer needed for navigation in Asian waters, instructions that were repeated in the following years for charts and logbooks. In so doing, the Amsterdam Chamber expected to be relieved of the future burden of sending so many valuable charts to Asia.⁴³

With Governor General Hendrik Brouwer's appointment in 1632, responsibilities of the *equipagemeester* were extended to include outfitting ships and corresponding with the Chambers in the Netherlands on navigational matters. The *equipagemeester* was to be assisted by one of the members of the Council of India or an expert in the art of navigation.⁴⁴

During Brouwer's tenure, experienced mapmakers and chartmakers were employed in Batavia, most of whom must have had professional contacts with Amsterdam mapmakers. Gerrit Hessels, a son of Hessel Gerritsz., entered the Company's service in Asia in or before 1632. Other mapmakers of these years, such as Mattheus du Chesne and Pierre du Bois, seem to have combined this office with that of surveyor.

In or shortly after 1640, the position of supervisor of navigation was created in Batavia. Responsibilities of this position, held by such experts as Maerten Gerritsz. de Vries in 1644 and Abel Jansz. Tasman in 1644–45,⁴⁵ included acting as experts in the field of navigation for the Council of Justice, writing sailing directions, and supervising the construction of charts. Other well-known figures in the field of navigation and exploration, such as Matthijs Hendricksz. Quast and Frans Jacobsz. Visscher, held positions in Batavia in which they influenced the output of the hydrographic office. Quast was *equipagemeester*, 1640–41, and Visscher composed several sets of sailing directions while in Batavia.⁴⁶

Another professional chartmaker working in Batavia, Joan Nessel, is the first to whom a relatively large number of maps can be attributed: more than thirty-five of his charts and maps are extant.⁴⁷ The workmanship on these documents, dating from the period 1650 to 1660, make it clear that Nessel was both a capable hydrographer and a skilled draftsman, pointing to an education in this field in the Netherlands. Except for his maps, we have no biographical information about him—an indication that he probably held a relatively low-paid position in Batavia and had no career beyond that of mapmaker.

A new mapmaker was needed in Batavia when Nessel died in about 1660. For a short period, this position was held by the junior pilot and mapmaker Jan Hendricksz. Thim (Tim), who produced a new chart of the Sunda straits based on his own reconnaissance.⁴⁸ Thim's chart, still extant, was accepted as a model from which new

standard charts were made in the following decades. Like the work of his predecessors, Thim's work shows how mapmaking in Batavia and Amsterdam were interdependent. The mapmakers working in Batavia were trained in the Netherlands, usually Amsterdam, or imitated the Amsterdam way of working, while the Amsterdam mapmakers depended on Batavia for corrected charts and new models.⁴⁹

In Batavia the coming and going of many capable pilots and skippers both stimulated and hindered the development of a professional mapmaking agency. It was

42. NA, VOC 7343, resolutions Heren XVII 8 and 28 August 1618, contains the three candidates for the post (Lenaert Jacobsz., Willem Jansz. [from Amersfoort], and Pieter Barendsz.). The instructions from the directors for their new official are dated 2 October 1618. A unique copy of these instructions can be found in the NA, VOC 313, fols. 326–27. In them, much attention is given to the need for competent administration and the construction of good warehouses. Barendsz. was appointed, resolutions Batavia 4 January 1620, quoted in Van der Chijs, *Nederlandsch-Indisch plakaatboek*, 1:599. At the end of that year, he returned to the Netherlands because of a bad injury.

43. NA, VOC 345, letters of Heren XVII to Asia 13 May 1620, 12 June 1621, and 5 September 1670, and Schilder, "Hydrographic Office," 72, n. 36, letter of 1620 of the Heren XVII to Coen.

44. See Pieter Mijer, ed., *Verzameling van instructiën, ordonnanciën en reglementen voor de regering van Nederlandsch Indië, vastgesteld in de jaren 1609, 1617, 1632, 1650, 1807, 1815, 1818, 1827, 1830 en 1836, met de ontwerpen der Staats-Commissie van 1803 en historische aantekeningen* (Batavia: Ter Lands-Drukkerij, 1848), 52–53; Van der Chijs, *Nederlandsch-Indisch plakaatboek*, 1:266–67; and Van Dam, *Beschryvinge*, 3:172–73.

45. *Dagregister Batavia*, 6 February 1644 (appointment of De Vries) and 2 November 1644 (appointment of Tasman).

46. For biographical details on Quast, see Jan Verseput, ed., *De reis van Mathijs Hendriksz. Quast en Abel Jansz. Tasman ter ontdekking van de goud- en zilvereilanden*, 1639 (The Hague: M. Nijhoff, 1954), esp. LXIV and LXVI, for his appointments as Council of Justice (4 January 1639) and *equipagemeester* (9 January 1640–18 June 1641). Quast was the successor of Schout, who returned to patria in the end of 1639.

47. Only a few of Nessel's maps and views are signed. However, because of his characteristic windrose, which acts as his signature, and his characteristic calligraphy, many others can be attributed to him; NA, *Verzameling buitenlandse kaarten*, U. VEL 291, 308, 361, 446, 503, 504, 506, 508, 942, 997, 1127, 1174, 1180, 1288–92, 1310, 1313, 1314, 1321–23, 1327, 1332, 1333, 1339, 1352, 1371, and probably 895, 991, 1108, 1109, 1181, 1231, as well as Supplement-*Verzameling buitenlandse kaarten* U. VELH 131 and 132.

48. On Thim, see Schilder, "Hydrographic Office," and K. Zandvliet, "Joan Blaeu's *Boeck vol kaarten en beschrijvingen* van de Oostindische Compagnie: Met schetsen van drie kaarttekenaars, Zacharias Wagenaer, Jan Hendricksz. Thim en Johannes Vingboons," in *Het Kunstbedrijf van de gouden eeuw*, ed. Jacobine E. Huisken and Friso Lammertse, exhibition catalog ([Maarssen]: Gary Schwartz, [1989]), 59–95, esp. 68–71.

49. Marcel Destombes wrote that the style of Thim's chart resembled that of Blaeu's charts of the period 1647–55; see his *Catalogue des cartes nautiques, manuscrites sur parchemin, 1300–1700: Cartes hollandaises. La cartographie de la Compagnie des Indes Orientales, 1593–1743* (Saigon, 1941), 49, entry 56.

stimulated by new cartographic information used to revise charts and to design new prototypes. The job and status of mapmaker, however, were not as attractive as those enjoyed by pilots and skippers, which discouraged recruitment. From 1620, mapmakers in Batavia were employed and paid to copy charts that had been compiled by better-paid skippers and pilots. Before 1660, a competent mapmaker, such as Nessel, must have felt underpaid.⁵⁰ This situation could be ameliorated only by being appointed an *equipagemeester*, who had the status, expertise, and interest to act as *cosmógrafo-mor*, or by being appointed a mapmaker with a status closer to that of Amsterdam colleagues and a salary equivalent to that of a skipper or pilot.

Meanwhile, the Amsterdam mapmaker was not really pushed aside by the mapmakers in Batavia. His much higher status and income, his access to the directors, and his prominent position in the world of learning and printing were more than enough to guarantee that instead of being overruled, he was able to use his colleagues in Batavia as first-class suppliers of cartographic information.

GEOGRAPHY AND LAND ADMINISTRATION AND THE VOC

The VOC was founded in 1602 to end the cooperation of merchants in local, private partnerships for their expeditions to the East and to strengthen the military and administrative connection between the merchants and the States General. The States General granted to the VOC administrative control over any overseas territories that it might acquire. Initially, as had happened in the Baltic and the Mediterranean, trading was confined to offices with storage facilities. In large parts of Asia—Arabia, Persia, Thailand, China, and Japan—the VOC's presence, until its dissolution in 1799, remained limited to such offices, in which cartographers and cartography of the interior played a negligible role.

Territorial expansion and the need for administrative control, however, soon played a major role in other regions. In Asia, where the VOC competed with European and Asian traders, the Company expanded its share of trade through an aggressive and, if necessary, military confrontation with the Portuguese and the English, confrontations that targeted primarily the weaker Portuguese. Hence the appearance of the European siege practice in the East, particularly where it concerned essential links in the trade network, such as Malacca, Colombo, and Macassar. For such sieges, military engineers were employed.

Territorial expansion tended to benefit from maximum control and the monopolization of certain crops, along with actual colonization. Note that the term “colonization” refers to the administrative control by the VOC, taking into account that in some areas (Malabar, Ceylon, and Java), agriculture was left to the indigenous popula-

tion whereas in others, agriculture was practiced by immigrants—by European (the Cape, Java, and the Moluccas) and Chinese colonists (Taiwan and Java).⁵¹

Territorial expansion occurred only in regions that lacked a powerful central authority; hence, the VOC was unable to expand into China, Japan, or the Mughal Empire. In the Indonesian archipelago, the VOC was able to enlarge the area it controlled through military confrontations and contracts at the expense of local rulers.

To a large extent, the VOC expansion took place at the expense of Portuguese trade and establishments. By copying Portuguese maps, local knowledge was obtained in an indirect manner by the VOC, which also managed to obtain town plans of Portuguese possessions. One example is the circa 1627 VOC manuscript atlas of Ceylon (twenty-four maps), which was a copy of a no longer extant atlas compiled in 1606 at the request of the Viceroy of India, Francisco da Gama. Either an original or a copy fell into Dutch hands, and the VOC had the work translated and the maps copied, probably by Gerritsz.⁵² Other detailed town plans of Portuguese origin, either copied or edited, can be found in the VOC archives and other collections.⁵³

The VOC placed great value on maps and related descriptions of territories under its administration or within its trading sphere. The mapping of Ceylon can be used as an example of how maps were regarded. In 1645, the Dutch and the Portuguese established a line demarcating the boundary between their territories on Ceylon. Because of their limited geographic knowledge of the area, the Dutch felt obliged to include a special clause absolving them of their contractual obligations in case the Portuguese had cheated them regarding the local situation.⁵⁴

50. Van Dam, *Beschryvinge*, 1:555–57 and 6:239–50.

51. For general English-language surveys and bibliographies of the history of the VOC in the context of the history of the Dutch Republic and competing states and companies, see J. R. Bruijn, F. S. Gaastra, and Ivo Schöffer, eds., *Dutch-Asiatic Shipping in the 17th and 18th Centuries*, 3 vols. (The Hague: Nijhoff, 1979–87), and Jonathan Irvine Israel, *Dutch Primacy in World Trade, 1585–1740* (Oxford: Clarendon Press, 1989).

52. Armando Cortesão and A. Teixeira da Mota, *Portugaliae monumenta cartographica*, 6 vols. (Lisbon, 1960; reprinted with an introduction and supplement by Alfredo Pinheiro Marques, Lisbon: Imprensa Nacional–Casa de Moeda, 1987), 5:117 and pl. 610b, and NA, *Verzameling buitenlandse kaarten* 928.

53. For example, maps of the Banda Islands near Eredia, Jaffna, Macao, and Manila in the NA, *Verzameling buitenlandse kaarten*, *Supplement-Verzameling buitenlandse kaarten*, and the Vingboons and Blaeu–Van der Hem atlases. See also the series of town plans by João Teixeira Albernaz II from about 1660 in the Dionysus Paulusz. file, BL, Add. MS. 5027A.

54. J. E. Heeres and Frederik Willem Stapel, eds., *Corpus Diplomaticum Neerlandico-Indicum verzameling van politieke contracten en verdere verdragen door de Nederlanders in het Oosten gesloten, van privilegebrieven aan hen verleend*, 6 vols. (The Hague: Martinus Nijhoff, 1907–55), 1:444–47.

The problem of this lack of knowledge was quickly corrected. When Governor Joan Maetsuycker was promoted to the office of Governor General in 1650, he provided his successor with instructions to improve the map of Ceylon, a recommendation followed by Rycklof (Rijcklof) van Goens (Governor General, 1678–81).⁵⁵

The Heren XVII's general instructions of 1670 for all the Company's merchants lay out in detail how the latter should describe their districts through the use of maps and reports.⁵⁶ These instructions are essential to understand the maps of the period because the text is a systematic summary of a practice developed from the early seventeenth century.⁵⁷ The 1670 instructions make it clear that the map was viewed as an aid to clarify political, military, economic, cultural, and administrative particularities in order to make sound decisions. By this time, such detailed instructions for the description and mapping of territories began to appear in other countries. For instance, similar instructions were suggested by Robert Boyle in 1665–66.⁵⁸

Maps and reports were prepared for every territory in which the VOC exercised administrative control or maintained intensive and extended trade contacts. Despite the important role that these maps played, the number of surviving examples is relatively small. This is partly because these maps were revised from time to time, after which the old ones were considered obsolete and discarded.

Travels to the interior provided another important source for geographical maps. In several larger areas, scouting expeditions produced route maps, but because of the cost and the risks involved, the number of such expeditions was limited. Among the route maps can be included maps that provided information about wayside trading stations and inns.⁵⁹ On the Asian mainland and on the islands of Japan and Java, VOC merchants moved in convoys to court and trade centers located inland. The maps of their routes are in part based on their own observations but should be regarded mainly as interpretations of local knowledge and maps. This limitation is certainly true for the route maps for Persia, India, China, and Japan. Many maps of Asian countries published in the atlases of Blaeu, Janssonius, and others indicate the routes followed by merchant-ambassadors of the VOC and the cities they passed on their way to the courts of the local rulers.

Large-Scale Maps and Plans for Standardized Settlements

The production of large-scale maps and drawings resulted from two activities: the creation and upkeep of military and civilian works, and the exploitation and management of commercial crops (principally relating to land management and taxation). Overseas, the design of fortifications and towns incorporated standard features, but

modified them to take into account the actual situations in which they were to be built or laid out. The core of an overseas settlement was the citadel, which, in combination with other fortifications, could be used to fend off an attack from outside, but could also be defended separately, including against attacks from within the settlement.⁶⁰ To be able to fire at the settlement from the citadel, open ground was left between the citadel wall and the first houses. This space, called the esplanade, was used as a drill ground, a garden, or as the market square.

The citadel was the center of the colonial and military administration. Because of its vital importance, it was centrally located and in such a way that supplies from the outside world could reach it easily. In overseas practice, this requirement meant a location at the coastline or, in case of a settlement on a river, at the point closest to the river's mouth. The VOC, essentially a maritime power, in this way effectively combined power at sea with control of a territorial stronghold.

Planning for an overseas settlement usually went through a standard process. After a location had been chosen, its local situation was mapped. On this map, sites for one or more citadels were established, and a pattern

55. Sophia Pieters, trans., *Instructions from the Governor-General and Council of India to the Governor of Ceylon, 1656 to 1665* (Colombo: H. C. Cottle, Govt. Printer, 1908), 66.

56. For the complete text, see Van der Chijs, *Nederlandsch-Indisch plakaatboek*, 3:530, or Zandvliet, "Joan Blaeu's Boeck," 85–86.

57. Francisco Pelsaert for his 1627 description used a comparable systematic construction; see Francisco Pelsaert, *De geschriften van Francisco Pelsaert over Mughal Indië, 1627: Kroniek en remonstrantie*, ed. D. H. A. Kolff and H. W. van Santen (The Hague: Nijhoff, 1979), 53–58. See also "Grondig verhaal van Amboina" of 1621, written by Artus Gijssels, and "Vertoog van de gelegenheid des koninkrijk van Siam" (received in the Netherlands in 1622), both published in *Kroniek van het Historisch Genootschap te Utrecht* 27, 6th ser., pt. 2 (1872): 348–444 and 450–94, and 279–318. A similar approach can be found in the instructions issued in 1636 by Philip Lucasz. to François Caron, which laid the basis for Caron's description of Japan; François Caron and Joost Schouten, *A True Description of the Mighty Kingdoms of Japan & Siam*, ed. C. R. Boxer (London: Argonaut Press, 1935), xxxvii.

58. Robert Boyle, "General Heads for a Natural History of a Country, Great or Small," *Philosophical Transactions of the Royal Society of London* 1 (1665–66): 186–89; see Margaret T. Hodgen, *Early Anthropology in the Sixteenth and Seventeenth Centuries* (Philadelphia: University of Pennsylvania Press, 1964), 188–89.

59. See the routes through the Mughal Empire (India), China, and Japan on atlas maps: *Magni Mogolis Imperium* in Blaeu's *Atlas maior*, and Joan Nieuhof's maps of the routes between Canton and Peking and between Nagasaki and Tokyo (Edo). An early example of an overland journey for which the itinerary is preserved is that of Pieter van Ravesteyn in India in 1615. He traveled from Masulipatnam to Surat; Heert Terpstra, *De opkomst der westerkwartieren van de Oost-Indische Compagnie (Surratte, Arabië, Perzië)* (The Hague: M. Nijhoff, 1918), 35–54.

60. Adam Freitag, *Architectura militaris nova et aucta, oder neue vermehrte fortification, von regular vestungen, von irregular vestungen und aussen werken* (Leiden: Bey Bonaventura and Abraham Elzeviers, 1631).

for a settlement was projected onto the map in relation to the citadel(s). This procedure led to a definitive plan on which all the earthworks and buildings to be constructed were indicated. With the help of a compass (*winkelkruis*), a surveyor's chain (or a rope), and poles with vanes, the plan was marked out in the field, indicating the building lines of the fortifications and streets.

In many VOC-controlled cities the fortifications were radically modified for budgetary reasons and to enable them to withstand attacks from European enemies. An anonymous English observer wrote the following concerning Cochin: "But the Dutch having this city surrender'd to them in the year 1662 immediately demolished the houses and all the churches but one in order to bring it into a narrower compass and render their fortifications more regular, and they have made it almost impregnable, to which the stone of the churches they have pulled down greatly contributed."⁶¹

The designs for and discussions about Batavia, Cape Town, and Negapatam, as well as Taiwanese and Ceylonese cities, reveal maps and plans as forceful expressions of the absolute rule of the VOC administrators. Nevertheless, it is unwise to regard them too literally as reflections of reality, as many of the designs were never implemented.⁶²

From 1620, beginning with the tenure of Governor General Jan Pietersz. Coen, the VOC strove to monopolize production and trade of valuable crops and for sovereignty over production centers. Competing production centers that could not be brought under VOC administration were destroyed. Cadastral maps were employed in several regions, such as Ceylon, Java, Taiwan, and the Banda Islands.

In Ceylon, the land registration system was copied from the Portuguese, who had based their registration on the existing Singhalese system. Portuguese land registration did not make any use of maps. In two separate series of registers, the so-called *tombos*, the landowners and the parcels were entered, each with their property titles. Only from the late seventeenth century were maps added to the *tombos* to locate unregistered lots, to ease the burden of poor farmers who paid too heavy taxes, to raise the total tax revenue, and to have available exact maps of the areas governed by the Company.⁶³

In Java, the Company could not rely on indigenous land registration systems and from the 1620s organized a land registry system using maps, even though in the first years at Batavia the Company had coped with a land registry using only ledgers.⁶⁴ This system consisted of deep lots running perpendicular to a river, the coast, a waterway, or a dike, and it allowed access for supplies and transport without having to cross the property of another.⁶⁵ An example is Frans Florisz. van Berckenrode's plan of a lot granted to Laurens Nuyts in 1627.⁶⁶

On the Banda Islands, the coastline was used as the point of orientation for the land allocation.⁶⁷ The size of the lots distributed was related to the labor capacity at the owner's disposal.⁶⁸ Each owner initially received an allocation sufficient for twenty-five *zielen* (slaves). Each slave was expected to cultivate fifty square rods, resulting in lots the size of fifty square rods multiplied by the number of slaves of the owner (figs. 46.4 and 46.5).

On Taiwan, the VOC governed an agricultural area that rapidly grew because of the impact of Chinese farmers. These farmers were quite willing to settle because of the political unrest in mainland China, where the Ming

61. Geographical description of Asia, eighteenth-century manuscript, Chicago, Newberry Library, Ayer Collection no. 1302. Description in Ruth Lapham Butler, comp., *A Check List of Manuscripts in the Edward E. Ayer Collection* (Chicago: Newberry Library, 1937).

62. See, for instance, the map of Batavia and surroundings printed in Joan Nieuhof, *Joan Nieuhofs gedekwaerdige zee en lantrize, door de voornaemste landschappen van West en Oostindien* (Amsterdam: By de Weduwe van Jacob van Meurs, 1682). This map is based on a plan for the construction of fortifications and military roads in the vicinity of the town. An original planning map is in the NA, Verzameling buitenlandse kaarten 1181. For a variant copy, see Vienna, Österreichische Nationalbibliothek, Atlas Blaeu-Van der Hem, xxxix-24.

63. NA, VOC 1604, fol. 565; see L. Hovy, *Ceylonees plakkaatboek: Plakkaten en andere wetten uitgevaardigd door het Nederlandse bestuur op Ceylon, 1638-1796*, 2 vols. (Hilversum: Verloren, 1991), xcii, and the laws on the *tombos* for Jaffna, entry 117 (19 April 1675) and 177 (9 January 1690). See also Richard Leslie Brohier and J. H. O. Paulusz, *Land, Maps & Surveys*, vol. 2 of *Descriptive Catalogue of Historical Maps in the Surveyor General's Office, Colombo* (Colombo: Printed at the Ceylon Govt. Press, 1951). For an account of the eighteenth-century surveyors on Ceylon, see E. Muller and K. Zandvliet, eds., *Admissies als landmeter in Nederland voor 1811: Bronnen voor de geschiedenis van de landmeetkunde en haar toepassing in administratie, architectuur, kartografie en vesting- en waterbouwkunde* (Alphen aan den Rijn: Canaletto, 1987), 238-40.

64. Frederik de Haan, *Priangan: De Preanger-regentschappen onder het Nederlandsch bestuur tot 1811*, 4 vols. ([Batavia]: Bataviaasch Genootschap van Kunsten en Wetenschappen, 1910-12), 3:9. See also J. G. Janssen, "Grondregistratie Jacatra, Batavia, Djakarta" (Master's thesis, Delft University of Technology, 1952). For the seventeenth century, this thesis is less informative.

65. Simon van Leeuwen, *Het Rooms-Hollands-regt, waar in de Roomse wetten, met huydendaagse Neerlands regt* (Amsterdam: H. en D. Boom, 1678), 443. This system was also applied in Surinam for the same reasons; A. J. A. Quintus Bosz, *Drie eeuwen grondpolitiek in Suriname: Een historische studie van de achtergrond en de ontwikkeling van de Surinaamse rechten op de grond* (Assen: Van Gorcum, 1954), 34-35.

66. Zandvliet, *Mapping for Money*, 153-54.

67. Vienna, Österreichische Nationalbibliothek, Atlas Blaeu-Van der Hem, vol. xl-16, and BL, Add. MS. 34184. Illustrated in C. R. Boxer, *The Dutch Seaborne Empire, 1600-1800* (London: Hutchinson, 1965), fig. 13a, facing p. 230.

68. Land was granted or sold to European colonists. In the WIC's chartered territory, land was often leased to colonists. According to Jacob, the VOC as sovereign had no need for the feudal system; Eduard Herman 's Jacob, *Landsdomein en adatrecht* (Utrecht: Kemink en zoon N.V., [1945]).



FIG. 46.4. DETAIL OF CADASTRAL MAP OF BANDA NEYRA, 1630S. The boundaries are shown and the number of slaves (“zielen”) for each parcel is indicated. Size of the original: 47 × 63 cm; size of this detail: ca. 47 × 33.5 cm. Photograph courtesy of the Badische Landesbibliothek, Karlsruhe (Gijssels Collection, K 477, fol. 63).

and Manchu forces were fighting for power. Around Providentia, present-day Tainan, the cultivated area was sixty-eight square kilometers in 1657; more than double what it was twelve years earlier. Land surveyors produced registers and thematic maps to record an overview of the various crops—mainly rice and sugar cane—and the laying out of infrastructure and parcels. The VOC settled Chinese farmers in such a way that little or no contact was made with the areas inhabited by the aboriginal population. The principle of ethnic segregation was adopted

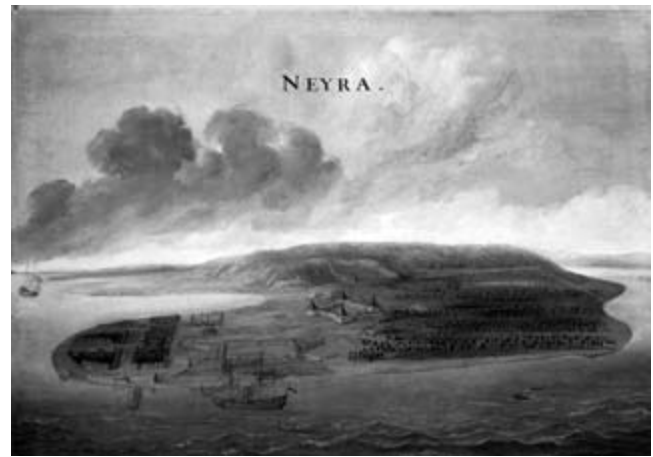


FIG. 46.5. BANDA NEYRA, 1662 OR 1663. Made in Vingboon’s studio, this is one of a series of oil paintings of overseas cities and fortresses that were formerly in the meeting room of the Heren XVII and other rooms in the East India House. There were also watercolors of the same locations, indicating that one prototype was often used.

Size of the original: 97 × 140 cm. Photograph © Rijksmuseum Amsterdam (SK-A-4476).

to limit clashes between Chinese and aboriginals, but also to prevent chances of an alliance between the two groups against the Dutch.⁶⁹

Experiments with the Roman Grid System

The VOC was often confronted with the problem of creating settlements quickly in new, unfamiliar settings, each with particular characteristics, and Dutch experts turned to Roman examples. Around 1600, the academic world in the Netherlands was quite familiar with the work of Roman land surveyors. A copy of the *Corpus agrimensorum Romanorum* was owned by the philologist Petrus Scriverius from Leiden.⁷⁰ Urged on by the business of warfare, Scriverius produced a modern edition of Vegetius’s *De re militari* (1607), and to this work he added Frontinus’s study on the art of surveying.⁷¹ In the foreword of this book, Scriverius promised to provide improvements to Frontinus’s text in later editions but left this task to the lawyer Willem Goes who, after years of preparation, published in 1674 his *Rei agrariae auctores*

69. Zandvliet, *Mapping for Money*, 154–59.

70. Hans Butzmann, ed., *Corpus agrimensorum Romanorum: Codex Arcerianus A der Herzog-August-Bibliothek zu Wolfenbüttel (Cod. Guelf.36.23A)* (Leiden: A. W. Sijthoff, 1970). The original was sold after the death of Scriverius and has since been in the Herzog August Bibliothek in Wolfenbüttel.

71. P. Tuynman, “Petrus Scriverius, 12 January 1576–30 April 1660,” *Quaerendo* 7 (1977): 4–45.

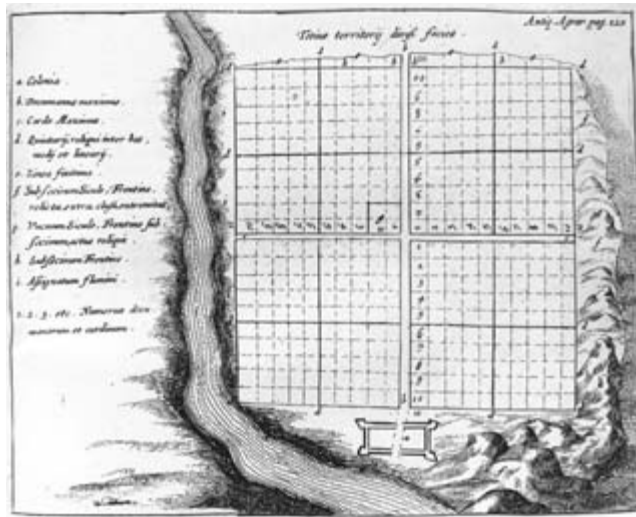


FIG. 46.6. EXAMPLE OF ROMAN LAND DIVISION. This appears in Willem Goes's *Rei agrariae auctores legesque variae* (Amsterdam: Apud Joannem Janssonium à Waesberge, 1674). Size of the original: 15 × 16.5 cm. Photograph courtesy of the Beinecke Rare Book and Manuscript Library, Yale University, New Haven.

legesque variae, a critical edition of the work of Frontinus and others on the subject of land division (fig. 46.6).⁷²

Simon Stevin integrated Roman and Dutch ideas in his *Castrametatio* (1617), explaining how blocks of buildings could be drawn on separate “playing cards” and then moved around on a grid. This grid had lines allowing for streets fifty feet wide and square blocks of buildings three hundred feet wide; if necessary, the blocks could be made narrower or wider. This flexible method influenced the practice of army camp construction in Europe and may have influenced the layout of Dutch colonial settlements.⁷³ David de Solemne, a specialized designer of military camps using Roman ideas, was in the service of the VOC from 1630.

Dutch ideas of colonization were influenced by the study of Roman authors in the fields of both law and mathematics. These ideas were, for a short time, applied in a rather rigid manner on Ceylon and at the Cape. At the Cape in 1657, Rycklof van Goens ordered the demarcation (*rooiing*) and distribution of land according to the Roman system.⁷⁴ On the corners of the rectangular parcels, the surveyor placed markers and recorded the distribution of the lots on a map.⁷⁵ The sides of the lots ran north-south and west-east. However, one of the shortcomings of this method of land distribution was that local conditions were not taken into account. In Van Goens's opinion, however, an important advantage was that by following a strict mathematical design, disagreements over the directions of borders would be avoided. After the capture of Colombo

in 1656, parcels of land around the town were distributed without taking the topography into account. Van Goens probably derived his ideas from academic friends in the Netherlands.

From 1648 to 1654, Goes was one of the VOC directors in Amsterdam.⁷⁶ Van Goens probably owed most of his knowledge and interest in this field to Goes and Johannes Hudde (director from 1679 to 1704),⁷⁷ whom he may have met when he was on leave in the Dutch Republic from September 1655 to November 1656.⁷⁸ The subject of the regular layout of cities, cultivated landscapes, and the use of Roman grids would have been discussed in the late 1640s and early 1650s in a group of people that included the statesman Johan de Witt, Hudde, and Goes. Their ideas inspired administrators overseas, of

72. Goes took over an *Agrimensores* manuscript from Scriverius that is now in the BL, Add. MS. 47679. Goes was a son-in-law of the Leiden poet/librarian Daniël Heinsius; Theodoor Herman Lunsingh Scheurleer and G. H. M. Posthumus Meyjes, *Leiden University in the Seventeenth Century: An Exchange of Learning* (Leiden: Brill, 1975), 458, n. 313. Goes also expressed his interest in mathematics through architecture. His house in The Hague was built in a sober classicist style; J. J. Terwen and Koen Ottenheim, *Pieter Post (1608–1669): Architect* (Zutphen: Walburg Pers, 1993), 123.

73. Charles van den Heuvel, “De huysbou, de crychconst en de wysentijt: Stevins teksten over architectuur, stede- en vestigbouw in het licht van zijn wetenschappelijk oeuvre,” in *Spiegheling en daet: Simon Stevin van Brugghe (1548–1620)* (Bruges, 1995–96), 51–53.

74. Van Goens's instructions for Jan van Riebeeck, 16 April 1657; see R. Fisher, “Pieter Potter of Amsterdam, the First South African Land Surveyor,” in *Proceedings of the Conference of Southern African Surveyors* (Johannesburg, 1982), 1–14, esp. 5, and I. D. West, “Pieter Potter—The First Surveyor of the Cape,” *South African Survey Journal* 13, no. 77 (1971): 22–27, esp. 24.

75. Penalties were imposed for the removal of markers; *Kaapse Plakkaatboek*, 6 vols., ed. M. K. Jeffreys, S. D. Naudé, and P. J. Venter (Kapaad, 1944–51), 1:47–48, 7/9 February 1659.

76. List of Directors, NA, Aanw. 938 (1902 XXVI 94).

77. Muller and Zandvliet, *Admissies als landmeter*, 26. Between 1679 and 1704, Hudde should be considered the mathematical specialist of the VOC, next to Witsen; see Bruijn, Gaastra, and Schöffer, *Dutch-Asiatic Shipping*. On Hudde and his interests in mathematics and natural sciences, see Peter Burke, *Venice and Amsterdam: A Study of Seventeenth-Century Elites*, 2d ed. (Cambridge, Mass.: Polity Press, 1994), 74–77; Van Maanen, *Seventeenth Century Mathematics*, 19 and 50–52; Johannes Mac Lean, “De nagelaten papieren van Johannes Hudde,” *Scientiarum Historia* 13 (1971): 144–62; and R. H. Vermij, “Bijdrage tot de bio-bibliografie van Johannes Hudde,” *Gewina* 18 (1995): 25–35.

78. There are later indications that Van Goens was on intimate terms with the political circle of Hudde. In a letter of 1676, probably directed to Gillis Valckenier, Van Goens called him “my patron.” Van Goens informed Valckenier about the state of affairs in Asia and told him what he thought of numerous high officials. He asked Valckenier to burn the letter after reading it. This Valckenier obviously did not do; he gave a copy to his nephew and political friend Hudde. See F. S. Gaastra, *Bewind en beleid bij de VOC: De financiële en commerciële politiek van de bewindhebbers, 1672–1702* ([Zutphen]: Walburg Pers, 1989), 39 and 123–26.

whom Van Goens was the most dedicated to the Roman tradition. All in all we should conclude, though, that the Roman system of land organization in the East had only a localized and, in its most rigid form, short-lived influence.⁷⁹

The contrary was true for the general approach of survey maps. The practice of land control in combination with surveys and survey maps was the rule. The VOC regarded surveys with thematic information on crops and town plans as essential instruments for management and planning. Just as in the Netherlands, accredited land surveyors registered land titles using ledgers and ledger maps (pre-cadastral maps). Starting with the terrain in and around the cities, ledger maps served a variety of needs: management, upkeep, taxation, control, and legal security. With this parcel-like registration system, which took its final shape in the eighteenth century, the VOC diverged from the practice in the Republic, in which no national or provincial registration system emerged until 1800.

THE WEST INDIA COMPANY

From 1621, Dutch trade in the Atlantic fell under the authority of the West India Company (WIC), which employed mapmakers, land surveyors, and engineers in the Republic and overseas. But the founding of the WIC did not make the Atlantic Ocean an exclusive area for the Company after 1621, as was the case in some parts of Asia. The relative openness of the Atlantic to international shipping resulted in WIC mapmaking agencies facing fierce competition in the production of charts. Chart production remained largely in the private sector; nevertheless, steps toward institutionalized mapmaking were taken after 1621.

Prior to 1600, little first-hand Dutch information existed. Dutch skippers and pilots sailing to Africa and America obtained knowledge of the routes while in the service of the Habsburg Empire or the Spanish, Portuguese, or English. The year 1600 proved something of a watershed. By this time, much of the information from outside the Netherlands had been incorporated into compilations or had simply been translated. For example, initiatives for the foundation of the WIC in the early 1600s led to the translation of Girolamo Benzoni's book about the New World (1565) by the painter and art historian Carel van Mander, published in Haarlem in 1610 under the title *Historie van de Nieuwe Werelt*. New maritime and geographical information was made available. Texts, maps, town plans, and views—often combined and sometimes printed—supplied merchants and skippers with the necessary logistical information for efficient trade and sailing. From each region, Dutch merchants collected infor-

mation concerning local history, inhabitants, flora, fauna, minerals, location, accessibility, climate, and fortifications. Most likely the Spanish *relaciones geográficas* on colonial territory from the second half of the sixteenth century served as models. One early published Dutch geographical description was by Pieter de Marees, who added to this 1602 work Baptista van Doetecum's engraved map of Guinea from an original by the Portuguese cartographer Luís Teixeira.⁸⁰ Two other geographical descriptions from this period are worth mentioning. In 1612, Pieter van den Broecke produced a description of Loango, and several years later, Joost Gerritsz. Lijnbaen, a Company trade agent, supplied a description of this area that was included in Nicolaas van Wassenaer's *Historisch verhael*.⁸¹ Reports based on the explorations of trade agents and scouts (*uytlopers*) followed suit.

Publishers, engravers, and authors were supported by the Dutch government, which granted privileges that gave some protection against illegal printing of their maps. In the decades before and after 1600, the States General were inclined to give subsidies and rewards for publications that stimulated the overseas expansion of the Republic. For example, charts and maps drawn on parchment in the first decades of the seventeenth century were part of the maritime inventory in the shops of Cornelis Claesz. and Willem Jansz. Blaeu. Few of the sober, utilitarian charts used at sea, sold along with the lavishly illustrated maps at Claesz.'s and Blaeu's shops, have survived. What have survived are a few of the charts by the Edam map scribes (*caertschrijvers*), embellished in a mannerist style for decorating home and office interiors.

HYDROGRAPHY AND THE WIC

The Amsterdam Mapmaking Agency

Like the VOC, the WIC did not leave the collecting and editing of information concerning maritime issues to the

79. For the general application of the grid pattern in the English and Spanish colonies and the grid as an enforcement of power, see Samuel Y. Edgerton, "From Mental Matrix to *Mappamundi* to Christian Empire: The Heritage of Ptolemaic Cartography in the Renaissance," in *Art and Cartography: Six Historical Essays*, ed. David Woodward (Chicago: University of Chicago Press, 1987), 10–50.

80. See Pieter de Marees, *Beschryvinghe ende historische verhael van het Gout Koninckrijck van Gunea anders de Gout-Custe de Mina genaemt liggende in het deel van Africa*, ed. S. P. L'Honoré Naber (The Hague: M. Nijhoff, 1912).

81. See Pieter van den Broecke, *Reizen naar West-Afrika, 1604–1614*, ed. K. Ratelband (The Hague, M. Nijhoff, 1950), introduction, and Nicolaas van Wassenaer and Barent Lampe, *Historisch verhael alder ghedenck-weerdichste geschiedenisse[n] die hier en daer in Europa*, 21 vols. (Amsterdam: Bij Ian Evertss. Cloppenburgh, Op't Water, 1622–35), October 1624.

initiative of skippers and publishers alone. Skippers and pilots were instructed to make maps of anchorages, coasts, and ports and to turn these over to the Company's board of directors, the Heren XIX, under penalty of three months' wages.⁸² In addition, the WIC had its own mapmaker, or, more correctly, its own exclusive supplier of maps. Between 1621 and his death in 1632, Hessel Gerritsz. was the WIC's map supplier. The organization of the cartographic production at the WIC was almost identical to that at the VOC. In both cases, the mapmaker remained active in the private sphere, where he used the name of the Company to enhance his reputation.

Although the Dutch were familiar with the Atlantic seaboard early in the seventeenth century, the founding of the WIC in 1621 gave a new stimulus to the translation and publication of works by foreign authors. Original Dutch works on the Atlantic soon followed. One of the earliest was written by a skipper from Zeeland, Dierick Ruijters, who took it upon himself to compile a navigation manual for voyages to the south Atlantic area; his *Toortse der zee-vaert* appeared in 1623. An important source for Ruijters was the manual by the Portuguese examiner of pilots, Manuel de Figueiredo, editions of which had appeared in 1609 and 1614.⁸³ The Portuguese work, however, formed only the basis for the *Toortse*, which was extensively annotated and expanded by the observations of Ruijters and his Dutch colleagues who, by then, knew the Atlantic territory from their own experience.

In 1627, Gerritsz. began the compilation of a navigation manual with detailed maps and coastal views. He first evaluated the overseas information of foreigners—an English manuscript rutter that he found among the documents of the Admiral Paulus van Caerden in the East India House and a rutter written in 1621 by the Spaniard Miguel de Ravires. In addition, he must have used the rutters published by Jan Huygen van Linschoten, Richard Hakluyt, and de Figueiredo. He then made a critical compilation from available journals, coastal views, and maps in the WIC and the VOC archives.⁸⁴ He spoke to dozens and possibly hundreds of skippers and pilots, among them Dierick Ruijters. Gerritsz. recorded observations directly from returning pilots in a book (*remonstrantieboek*), sheets of which can be found in what remains of the WIC's cartographic archives.⁸⁵

So, whereas the Dutch had been behind the Spanish and Portuguese in possessing cartographic information at the end of the sixteenth century, in 1632, a WIC official announced with pride that they had caught up: "All ports are known to us and he [the Spanish enemy] cannot change or disguise his course without us discovering it."⁸⁶ Indeed, one year earlier, Spanish authorities had ordered Dutch books on the art of navigation to be translated into Spanish.⁸⁷ The newly available detailed information was subsequently used for the production of

engraved small-scale charts, the so-called *overzeilers*, for long-distance ocean voyages.

The Hydrographic Office in Brazil, 1630–54

After its capture by the Dutch in 1630, Recife in Brazil became the WIC's overseas administrative center to coordinate military and exploratory expeditions and hydrographic surveys. Whereas the *equipagemeester* and the Governor General directed cartographic work in Batavia, the admiral was responsible for hydrography in Brazil. One of the first admirals working there was Johannes van Walbeeck, who, for two years beginning in the spring of 1630, was involved in various cartographic activities, including coordinating the survey of the coast of Brazil. Van Walbeeck gave the pilots the following instructions for a chart of the Brazilian coast in October 1631: "The commander will leave port in the shallow and set course for Rio Grande, remaining close to the shore, accompanied by the yacht, which is more seaworthy, and will as closely as possible inspect, in passing, all entrances, harbors, and bays to collect all pertinent information, and will drop anchor every evening at sunset, and only continue his voyage at daybreak."⁸⁸

After 1632, under the guidance of Admiral Jan Cornelisz. Lichthart, a new and more detailed chart was made of the Brazilian coast after a seven-year survey.⁸⁹ A few

82. NA, Library 57 H 9: *West-Indische Compagnie. Articulen met approbatie vande Hoogh Moghende Heeren Staten Generael der Vereenichde Nederlanden provisionelijck beraement by Bewinthebberen vande Generale West-Indische Compagnie* (Middelburg, 1637), Article 104.

83. S. P. L'Honoré Naber, ed., *Toortse der Zee-vaert, door Dierick Ruijters (1623), Samuel Brun's Schifffarten (1624)* (The Hague: M. Nijhoff, 1913), introduction.

84. Gerritsz. scrupulously mentioned his sources in his *roteiros*. He also made use of documents that had been acquired from the Plancius estate; E. J. Bondam, "Journaux et Nouvelles tirées de la bouche de marins Hollandais et Portugais de la navigation aux Antilles et sur les Côtes du Brésil: Manuscrit de Hessel Gerritsz traduit pour la Bibliothèque Nationale de Rio de Janeiro," *Annaes da Bibliotheca Nacional do Rio de Janeiro* 29 (1907): 99–179, esp. 177.

85. Another map with an extensive text by Gerritsz. records the findings of Bouwen Heyns (Hendricksz.) on the coast of Brazil in the summer of 1627. The text begins with the explanation that what followed was a declaration by Heyns himself, interviewed October 1627; NA, Verzameling buitenlandse kaarten 682.

86. Quoted from J. H. J. Hamelberg, *Documenten behoorende bij "De Nederlanders op de West-Indische Eilanden," 1: Curaçao, Bonaire, Aruba* (Amsterdam: J. H. de Bussy, 1901), 10–11.

87. Maurice van Durme, *Les archives générales de Simancas et l'histoire de la Belgique (IXe–XIXe siècles)*, 4 vols. (Brussels: Académie Royale de Belgique, Commission Royale d'Histoire, 1964–90), 2:60.

88. NA, WIC 49, fol. 166, Instructions to the pilots Albert Smient and Colster, October 1631.

89. Joannes de Laet, *Iaerlyck verhael van de Verrichtingen der Geocroyeerde West-Indische Compagnie in derthien boecken*, 4 vols., ed.

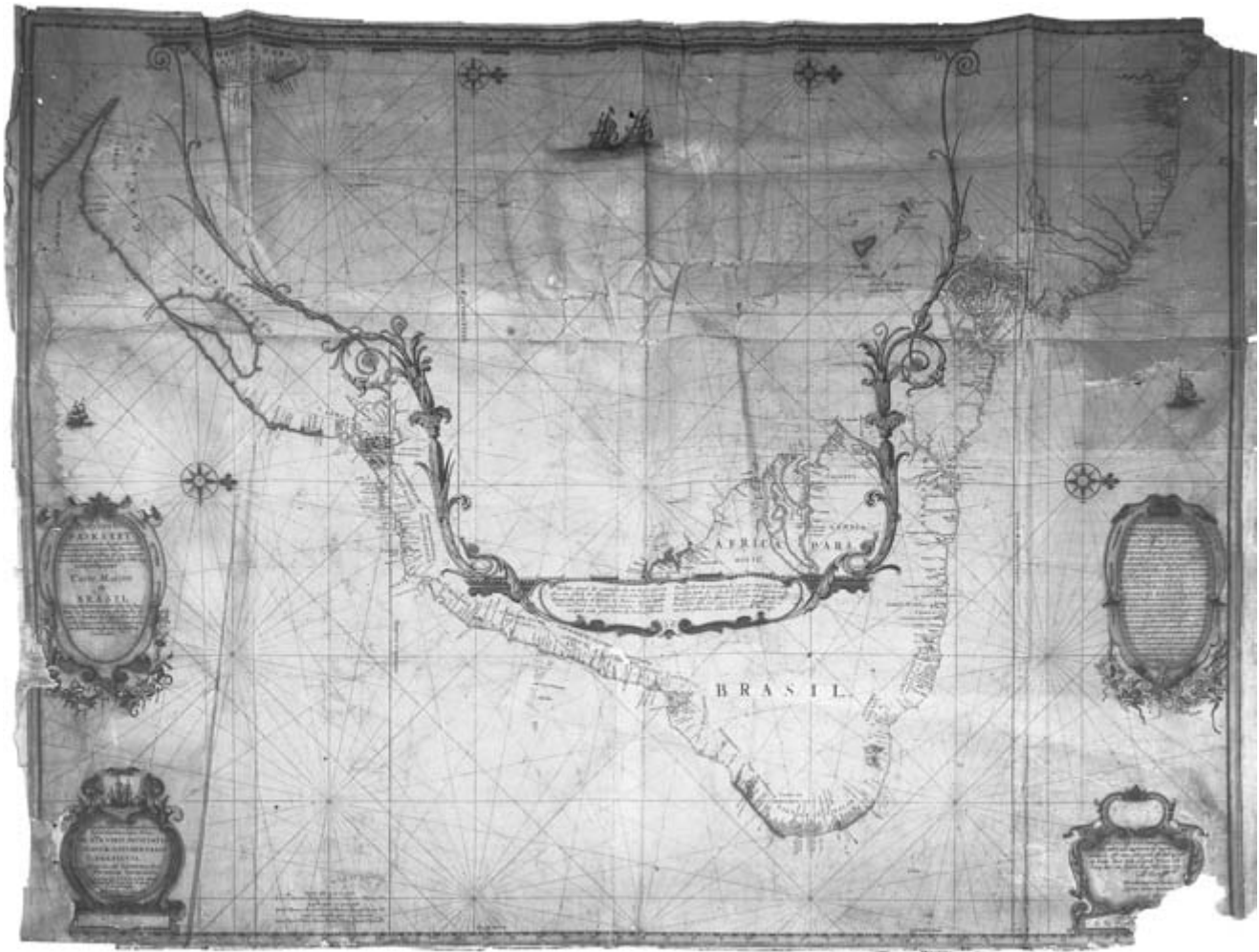


FIG. 46.7. GERRITZS.'S *BRASILYSCHE PASKAERT*, 1637. Completed in 1631, but published after Gerritsz.'s death in 1637 by Philips and Joannes Vingboons, this chart shows the crossing from Africa to Brazil, with much of the Atlantic

drawn within South America; west is at the top. Bibliothèque de l'Institut de France, Paris (MS. 1288, fol. 23). Photograph courtesy of Bridgeman-Giraudon/Art Resource, New York.

manuscript copies of this chart, made by Joannes Vingboons, have survived.⁹⁰ The title of one of the copies mentions that it was sent to the Netherlands by the Governor, Johan Maurits van Nassau, who arrived in Recife in 1637.

Charts for the Atlantic Area Produced in the Dutch Republic after 1633

In 1631, Hessel Gerritsz. completed two charts of the Caribbean and Atlantic as a pair, meeting at Cape Nassau on the north coast of South America. The Atlantic chart, showing the crossing from Africa to Brazil, was published after his death in 1632 by the brothers Joannes and Philips Vingboons.⁹¹ This *Brasilysche paskaert* (1637) provided pilots with information about the prevailing winds and ocean currents during the various seasons (fig. 46.7). In

crossing from the African coast, the captain used not only the wind, but the east-west ocean current. Ships crossing from Africa aimed at Cape Augustine, the most easterly point of South America (where the current splits and travels southwest and northwest), and from there they headed

S. P. L'Honoré Naber (The Hague: Martinus Nijhoff, 1931–37), 4:58 and 68. De Laet mentions the reconnaissance of the coast south of Recife by a fleet under the command of Lichthart in 1634 and mentions another reconnaissance that year, of the coast of Paraiba.

90. Wieder, *Monumenta Cartographica*, 4:113–14, pls. 85 and 86 for reproductions of the sheets in the Christina atlas in the Vatican, and 4:129 for a description of sheet 44 of the Vingboons atlas in Recife that includes Lichthart's name in the title.

91. M. Bouteron and J. Tremblot, *Catalogue général des manuscrits des bibliothèques publiques de France* (Paris: Librairie Plon, 1928), 246–47, entry 1288.

for Recife a few miles to the north while remaining safely within sight of the coast.⁹² On the home voyage, they made use of the current that travels northwest, sometimes stopping off in the Caribbean.

For a long time, the *Brasilysche paskaert* was the most advanced chart available.⁹³ It formed the basis of the map of Brazil in Joan Blaeu's atlas, first published in 1642.⁹⁴ After 1637, there was little that was new in hydrographic charting of Dutch Brazil, mainly because from 1637 to 1644, hydrographic charts and land maps of Brazil were combined to form a general map. There are indications that Joan Blaeu and Joannes Vingboons worked together on the production of large-scale prototypes for the new chart of the coast of Brazil (ca. 1639) compiled in Recife under the direction of the Admiral Jan Cornelisz. Lichthart.⁹⁵

The charts of the Atlantic and of the entire Caribbean became very popular and were reprinted several times. The *West-Indische paskaert*, which Blaeu's father had first published around 1629 and Blaeu had reprinted in 1639,⁹⁶ was revised and reprinted well into the eighteenth century and was copied by the publishers Jacob Aertsz. Colom, Anthonie (Theunis) Jacobsz. (Lootsman), Hendrik Doncker the elder, Pieter Goos, Johannes van Keulen I, Hugo (Huych) Allard, Jacob Robijn, and Johannes Loots.

The WIC director Samuel Blommaert was a leading geographical expert.⁹⁷ He wrote that he took much more care than others to obtain "detailed knowledge of whatever happened within the limits of the charter [of the WIC] as well as to continuously take information from anyone who comes from that region."⁹⁸ Blommaert's geographical interests and his activities as both a WIC director and agent of Sweden resulted in the monumental three-volume manuscript atlas by Joannes Vingboons preserved in the Vatican. This atlas once belonged to Queen Christina of Sweden and is connected to Swedish overseas activities that developed on the coasts of North America and Africa after 1635. A number of the maps in the atlas give details about Swedish settlements.⁹⁹

The Christina atlas gives an excellent impression of the level of the WIC's hydrographic knowledge at mid-century. The atlas includes a collection of fifty-six manuscript charts that together form the WIC's *padrón real* of the Atlantic Ocean, as well as a small-scale index chart of the entire chartered territory (fig. 46.8).¹⁰⁰ All the information from the overseas explorations collected by Gerritsz. and Vingboons was used for creating this *padrón*, the only complete version of which is in the Christina atlas.

All fifty-six charts forming this *padrón* were drawn at the same scale (1:500,000) and, if connected, would form a general map more than eight meters in length.¹⁰¹ The *padrón* provides an image of the coasts of North and South America, from Newfoundland down the east coasts, through the Strait of Magellan, and up the west coast as far

north as the southern point of California; it also provides an image of the west coast of Africa from the Senegal to the Cape of Good Hope (plate 56). These maps can also be regarded as a model for a navigation manual, which had already been promised to the public in 1608 by Willem Jansz. Blaeu and for which Joan Blaeu had great expectations. For various reasons, the Blaeu/Vingboons manual never materialized; Joan Blaeu probably wanted a manual of grandiose proportions, but the WIC had no intention of financing such an expensive book.

Shortly after 1650, the WIC lost its leading role in the production of its charts. There are few indications that

92. The later Admiral Michiel de Ruyter probably used the chart on his crossing from Africa to Cape Augustine in 1641. According to De Ruyter, the chart was not correct; he had "sailed 78 miles on land," according to the chart, before he actually sighted the coast. NA, De Ruyter archives 171, fols. 32–33.

93. Johan Radermacher (director of the WIC in Zeeland), in his circa 1670 portrait painted by Pieter Nason (present location unknown), holds in his right hand a partly rolled up chart that looks like the *Brasilysche paskaert*. In addition to the chart, a globe, a book (perhaps by De Laet), and a ship in the background underline his role as a WIC director. The painting was on sale in the Kunsthandel Fetter in Amsterdam in 1948 (a photo reproduction is in the documentation system of the Department of Paintings, Rijksmuseum, Amsterdam).

94. See *Brasilia*, dedicated to Arciszewski, the Polish army commander for the WIC in Brazil, in Koeman, *Atlantes Neerlandici*, 1:144.

95. A manuscript copy of the Lichthart chart is preserved in Recife, Instituto Archeológico, Histórico e Geográfico Pernambucano (Wieder, *Monumenta Cartographica*, 4:129). Lichthart's chart also circulated through the workshop of Blaeu. A manuscript title of the same chart is preserved in the file of Blaeu's assistant Dionysus Paulusz.; BL, Add. MS. 5027A.

96. C. A. Davids, *Zeewezen en wetenschap: De wetenschap en de ontwikkeling van de navigatietechniek in Nederland tussen 1585 en 1815* (Amsterdam: Bataafsche Leeuw, [1985]), 96. See also the auction catalog in Frederik Muller, *Catalogue de manuscrits et de livres provenant des collections: Baron Van den Bogaerde de Heeswijk; Jbr. Dr. J. P. Six, à Amsterdam; M[onsieur] L. Hardenberg, à La Haye; M[onsieur] A. J. Lamme, ancien directeur du Musée Boymans à Rotterdam*, 2 vols. (Amsterdam: Frederik Muller, [1901]), 2:42–43, entry 1421.

97. Blommaert served as a director in 1622–29, 1636–42, and 1645–54; based on G. W. Kernkamp, "Brieven van Samuel Blommaert aan den Zweedschen rijkskanselier Axel Oxenstierna, 1635–1641," *Bijdragen en Mededeelingen van het Historisch Genootschap* 29 (1908): 3–196, esp. 21–22.

98. Quote taken from a letter published in Kernkamp, "Brieven van Samuel Blommaert," 39–40 and 123.

99. The contents of the atlas make it possible to date it to about 1650, or fifteen years earlier than the generally accepted date given by Wieder. That the atlas was made especially for Christina suggests that it be called the Christina atlas rather than the Vatican atlas. See Zandvliet, *Mapping for Money*, 179.

100. The term *padrón real* is used because, as in the Spanish case, we have to imagine that Gerritsz. and Vingboons revised a set of large-scale master charts over a period of many years. From these master charts they could produce special charts or, as in the case of the Christina atlas, a reproduction of the entire set, covering the entire chartered area of the WIC.

101. Koeman, "Dutch West India Company," 1:305–17.

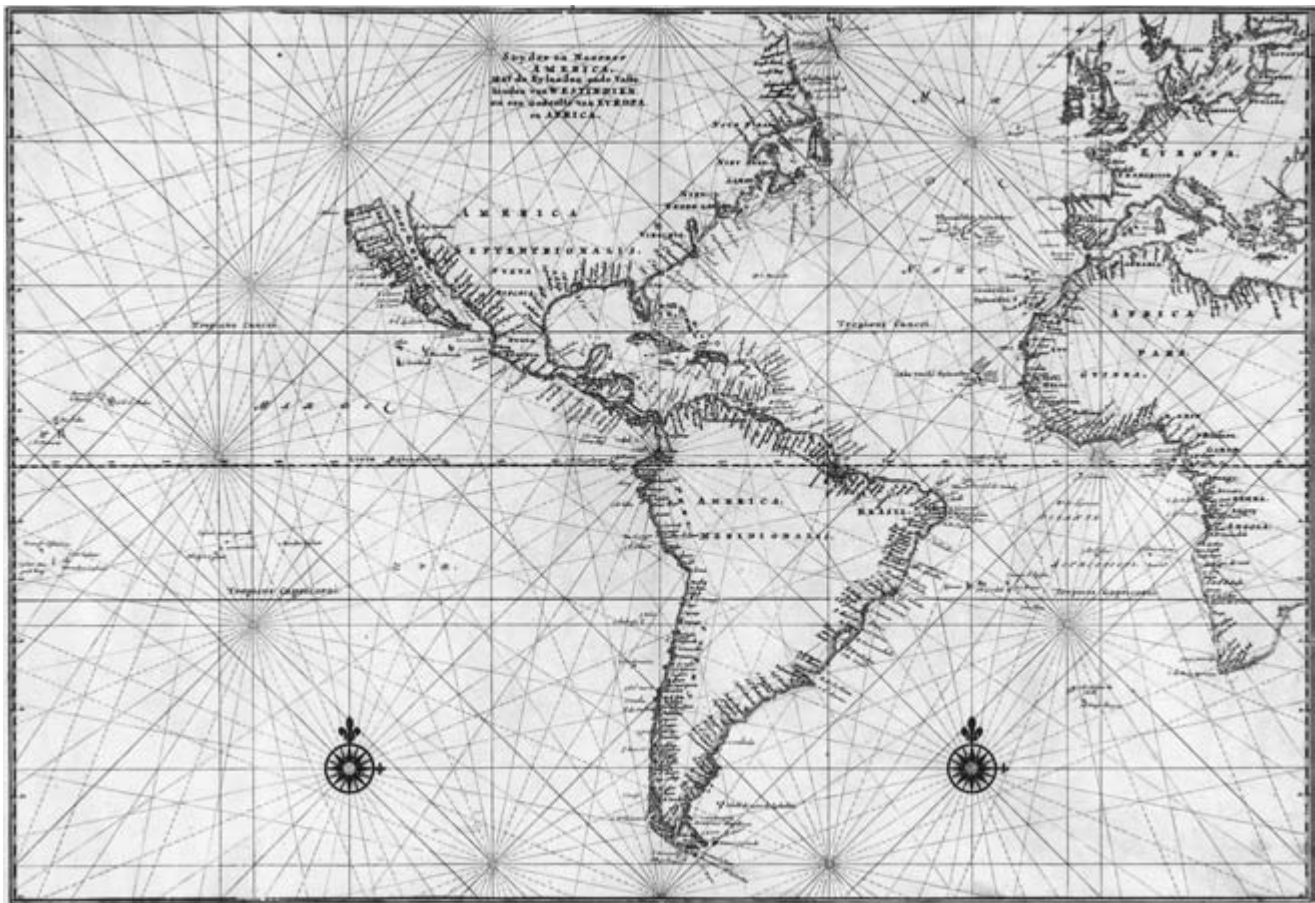


FIG. 46.8. INDEX MAP FROM THE CHRISTINA ATLAS BY JOANNES VINGBOONS, CA. 1650. Shows on a small scale the areas for which large-scale maps are included.

Size of the original: 50.5 × 76.5 cm. Photograph © Biblioteca Apostolica Vaticana, Vatican City (Reg. Lat. 2105, fol. 1r).

skippers still obeyed the instructions to hand over maps showing new explorations to the Company. The WIC's retreat in the field of maritime cartography was completed in 1674 with the founding of the second WIC, after the first had gone bankrupt. Dutch shipping in the Atlantic was liberalized. Private mapmakers then took over the cartographic task completely, which was a return to the situation prior to 1621.

The Middelburg WIC Chamber inspired the local mapmaker Arent Roggeveen to move forward with his own manual for the Atlantic rather than wait for Blaeu or other Amsterdam mapmakers. In 1668, Roggeveen obtained the privilege for his *Burning Fen* (*Het brandende veen*), to be published in Dutch, English, French, and Spanish. The *Burning Fen* was an important breakthrough: it was the first printed navigation manual with large-scale charts accompanied by coastal profiles and descriptions of the entire Atlantic territory, and it reached a broad international market.

In 1680, the Amsterdam publisher Van Keulen and his partner Claes Jansz. Vooght obtained a privilege for a

competing navigation manual, the *Zee-fakkel*, a commercial product that fit well with the creation of the free-trade area in 1674, the year the WIC was dissolved and a new WIC, with a more limited scope, was founded. Van Keulen's *Zee-fakkel* gives detailed information on the entire Atlantic region and was published in Dutch, Italian, and Spanish; a planned English edition never materialized. Volumes 4 and 5 of the *Zee-fakkel*, covering the non-European Atlantic territory, first appeared in 1683–84, prior to the completion of Jacob Robijn's second part of the *Burning Fen*, its main competitor. Van Keulen's work distinguished itself from the works of Dutch and foreign competitors by its large number of coastal views, enlarged views of estuaries, and dense shading that showed coastal relief.

GEOGRAPHY AND LAND ADMINISTRATION OF THE WIC

Unlike chartmakers, the makers of geographical maps were prepared to use noncartographic sources, and this practice was not limited to overseas areas. We know from



FIG. 46.9. NIEUW NEDERLAND COMPILED BY GERRITSZ.

Size of the original: ca. 104 × 39 cm. Photograph courtesy of the NA (VEL 519B).

a 1628 letter by Gerritsz. that he compiled a map of Scandinavia from a combination of maps and written descriptions.¹⁰² This was not a Dutch invention; for example, the Portuguese map that locates the nations living in northeast Africa—the land of Prester John, priest king of Ethiopia—was obviously compiled with the aid of local informants.¹⁰³ On the coasts of the Americas and Africa, Dutch merchants were largely dependent on local peoples, with whom it was important to develop good relations in coastal areas to generate knowledge of trade products, the topography, and population in the interior.

On Dutch maps we can see how indigenous knowledge was incorporated. Both on manuscript and printed maps of Nieuw Nederland, of which Gerritsz. was presumably the compiler, one sees explicit attention given to the location of Indian groups. Gerritsz. provided a rare attestation in the legend of a map mainly based on the observations of Cornelis Hendricksz. in 1616 (fig. 46.9), which shows how conscientiously he tried to combine information from Dutch scouts (*uytlopers*) and Indians:

Of that what Kleyntjen [a Dutch explorer] and his companion have indicated to me about the location of the rivers and the places of the nations which they have found on their outward trip from the Maquas to the inland along the New River down to the Ogehage [Oglala?], enemies of the above-mentioned Northern nations, I can at this point find only two partly finished drafts of maps. When I speculate how this and the other draft should be combined, I conclude that the locations for the nations of the Sennecas, Gachoo, Capitanasses and Jennecas should be drawn quite a bit further to the west.¹⁰⁴

As can be seen from this North American example, diplomatic considerations played an important role. The Dutch companies researched whether a given native nation was on friendly terms with the English, Spanish, or other native nations and took this into account when deciding whether to trade with one or the other of these nations. Not only was the political attitude of the nations relevant to the Dutch, but also their potential as partners for profitable trade.

102. Letter to Theodor Rodenburg, transcription in Dutch in Zandvliet, *De groote waereld*, 178–79.

103. For a manuscript copy of this Portuguese map, see the file of Dionysus Paulusz. in the BL, Add. MS. 5027A. Paulusz. copied a map of the Jesuit cartographer Manoel de Almeida of the 1640s. Almeida's map was published in Manoel de Almeida, *História geral de Etiópia alta* . . . , ed. Balthazar Telles (Coimbra, 1660); see figure 38.28.

104. In my opinion this concerns a comment by Gerritsz. of a somewhat later date. I assume Gerritsz. may have made these observations for the Compagnie of Nieuw Nederland. The observation made by Gerritsz., in which he speaks in the third person about his informer, is typical of his scrupulous way of working.



FIG. 46.10 WALL MAP OF DUTCH BRAZIL PUBLISHED BY JOAN BLAEU, 1647. Based on the 1643 map by Georg Marcgraf, the map contains new information, including results from important explorations in the interior in 1640 and 1643. The legend contains eighteen symbols—including four

types of sugar mills and two distinctions of Indian village (“ordinary” and “allied”).

Size of the original: 101 × 160 cm. Photograph courtesy of the Universitäts- und Landesbibliothek, Darmstadt (O 3051/480).

Dutch knowledge of unexplored areas through the accumulation of contacts was sometimes acquired through espionage and the use of physical force. An example is found in the case of a member of the Tiguar, Pieter Potty, who was abducted and taken to Amsterdam. In one of his rutters, Gerritsz. reported on a March 1628 interview of several Brasilians (as the Tiguar were usually called), held in Amsterdam by the director Kiliaen van Rensselaer.¹⁰⁵ The Tiguar lived in villages (*aldeias*) and were considered people that could be converted to Christianity.¹⁰⁶ Some of these “Christianized” peoples were enemies of the Portuguese and thus potential allies. Thirteen Tiguar were taken to Holland and educated to serve as interpreters and in the early 1630s were employed in this capacity in Brazil.¹⁰⁷ The Tapuyas (Tarairiu) were enemies of the Portuguese in Brazil. Because information about the friendly attitude of the Tapuyas was important in 1629/30, when the Dutch were preparing the attack on Recife, the chart

of the northeast coast of Brazil that Gerritsz. designed around 1630 indicated the residential areas of the Tiguar, the Tapuyas, and others. On the *Brasylysche paskaert* this information is expanded to more than twenty Indian peoples. After 1630, the Tapuyas indeed proved to be faithful allies. Their special status is confirmed on the map of Dutch Brazil by Georg Marcgraf (Margraff; Marggravius), which Blaeu published in 1647 (fig. 46.10). On this

105. Bondam, “Journaux et Nouvelles,” 171.

106. John Carter Brown Library, Codex Du 1, fols. 9–11, report on the Tiguar in a contemporary Dutch manuscript. See also E. van den Boogaart, “Infernal Allies: The Dutch West India Company and the Tarairiu, 1631–1654,” in *Johan Maurits van Nassau-Siegen, 1604–1679: A Humanist Prince in Europe and Brazil*, ed. E. van den Boogaart (The Hague: Johan Maurits van Nassau Stichting, 1979), 519–38, esp. 521–22.

107. Van den Boogaart, “Infernal Allies,” 522–27.

map, as is explained in the legend, different symbols are used for the villages of the Tapuyas (friends of the Dutch) and the “Indians” (Indians other than the Tapuyas: enemies or less trustworthy groups).

Espionage and Intelligence

For general topographic and economic mapping, espionage was not necessary because the information needed was usually readily available. But such was not the case when preparing maps for military operations. In the Atlantic area, large-scale maps played an important role in each military engagement. During the first decades of the seventeenth century, when Dutch expansion was targeted mainly at territories occupied by the Spanish and Portuguese, current military cartographic information was important but difficult to maintain because the enemy responded to Dutch actions by constructing new fortifications.

For military engineers working for the WIC in Brazil in the 1630s, reconnaissance of Portuguese fortresses was a routine matter: before an attack was launched, they would usually prepare a map to inform the commanders.¹⁰⁸ Such maps were usually reconnaissance surveys based on estimates and not surveyed measurements. Military engineers were also present on Dutch naval fleets sailing in European, Mediterranean, and Atlantic waters.

Town and Fortification Construction

Citadels were the center of the overseas settlements, as we have already seen in South Africa and Asia, where the policy of long-term budget cuts combined with strong citadels was most evident. In America, the Heren XIX administered areas that were strategically even more vulnerable to revolts and attacks from European enemies. To fortify entire settlements was costly, and defense against attacks from indigenous peoples, internal revolts, or European enemies proved most effective from a citadel, often located on the coast or estuary. New Amsterdam (New York) and settlements like Paramaribo in Surinam were organized this way.¹⁰⁹

From time to time, large-scale maps were made in New Amsterdam for the upkeep of military and other public works as well as for the registration of properties. Authorities in New Amsterdam were also encouraged to do so because they had difficulties in controlling the development of the town, as the wording of their decision of 25 July 1647 attempting to resolve this problem suggests: “As we have seen and remarked the disorderly manner, hitherto and now daily practiced in building and erecting houses, in extending lots far beyond their boundaries, in placing pig pens and privies on the public roads and streets, in neglecting the cultivation of granted lots, the

Director General Petrus Stuyvesant and Council have deemed it advisable to decide upon the appointment of three surveyors.”¹¹⁰

Agriculture and Land Organization

Overseas cartography played a role in matters of agriculture and land organization outside the built-up areas. From 1667, the colony of Surinam had been in Dutch hands. Planters were given land titles (*grondbrieven*, also referred to as *warrands*, a term used by earlier English administrators) when the lots were distributed. The registration and transfer of lots had to take place in the office of the colony. Uncultivated territory remained in the possession of the directorate. Parts of the wilderness were handed to planters without charge on the condition that they be cultivated. Lots never entirely became the property of colonists: the Directorate maintained the final legal ownership, so that when planters failed to cultivate their lot as required, ownership reverted to the administration.¹¹¹

Land surveyors decided on the pattern of land allocation. The establishment of colonies and the surveying and mapping of lots took place either shortly before or at the time of the land distribution. Land surveyors therefore played a prominent role in the Dutch colonies, such as Barbados, from the very beginning.¹¹²

The Dutch Practice of Land Allocation

The system of allocating land with long lots perpendicular to a river bank had its origins in the Low Countries in

108. The engineer Pieter van Buren reconnoitered the fortress of Paraiba in the autumn of 1631; NA, WIC 49, 7 October and 2 November 1631. This map survives in the NA, Verzameling buitenlandse kaarten 698. Golyath went in 1638 to spy on the Portuguese fortresses in the Bahia de Todos los Santos. The original map is in the NA, Verzameling buitenlandse kaarten 718.

109. Based on F. C. Wieder, *De stichting van New York in juli 1625: Reconstructies en nieuwe gegevens ontleend aan de van Rappard documenten* (The Hague: M. Nijhoff, 1925). See also P. Meurs, “Nieuw-Amsterdam op Manhattan, 1625–1660,” *Vestingbouwkundige bijdragen* 4 (1996): 19–31.

110. Berthold Fernow, ed., *The Records of New Amsterdam from 1653 to 1674 anno Domini*, 7 vols. (New York: Knickerbocker Press, 1897), 1:4.

111. See the law of September 1688 in Jacob Adriaan Schiltkamp and Jacobus Thomas de Smidt, eds., *Plakaten, ordonnantiën en andere wetten, uitgevaardigd in Suriname, 1667–1816*, 2 vols. (Amsterdam: S. Emmering, 1973), 1:180–81.

112. F. C. Innes, “The Pre-Sugar Era of European Settlement in Barbados,” *Journal of Caribbean History* 1 (1970): 1–22, esp. 13. For a comparison with Dutch practice, see Charles T. Gehring, ed. and trans., *Land Papers* (Baltimore: Genealogical Publishing, 1980), and R. J. P. Kain and Elizabeth Baigent, *The Cadastral Map in the Service of the State: A History of Property Mapping* (Chicago: University of Chicago Press, 1992), 265.

the eleventh century,¹¹³ and lots created in the Netherlands at that time can still be recognized in today's landscape. In the seventeenth century, the same method was still mentioned by the legal scholar Hugo Grotius as the normal pattern for land distribution.

The allocation system used for land reclamation projects in the Republic underwent changes in the sixteenth and seventeenth centuries. Usually this system involved a matrix designed on a drawing table, showing lots, roads, and ditches to be completed as short-term projects, with little attention being paid to the courses of existing creeks. In these projects, the land surveyor played a dominant role as both hydraulic engineer and land organizer; the original landscape had little influence on decisions about the layout of canals, roads, and lots. For agricultural areas, the Dutch, whether within or beyond their national borders, applied both the medieval and the modern systems.

Entire colonies were also organized as planters' lots in the WIC's chartered area, and anyone who wanted to establish a colony received land in an enormous, long lot. In a 1629 WIC charter, this policy was formulated as follows: "[Founders of colonies] may extend their limits four miles along the coast, or along a navigable river, or two miles along both sides of a river and as far inland as the ability of the occupiers will allow them."¹¹⁴ As with the distribution of planters' lots, this method of distributing land in Dutch colonies implies that a cartographic representation of the area must have been used as a basis.

Leggerkaarten

To monitor the distributed lands, the administrators of a colony needed a small-scale cadastral map (*leggerkaart*) on which the lots and rivers could be recorded in a general way. In addition to legal requirements, the *leggerkaart* was important as the basis for the levy of a land tax (*akkergeld*). The *leggerkaart*, comparable in style with estate maps and polder authority maps (*waterschapskaarten*),¹¹⁵ was made by reducing in scale the maps of the separate lots and combining them onto a basemap with emphasis on hydrography. From the very first settlements in Surinam, Essequibo, Demerara, and Berbice, the *leggerkaarten* were produced and regularly updated. Planters occasionally needed to be reminded to register their land titles, to respect plot boundaries, and to maintain them so that they would remain visible. In the late seventeenth and the eighteenth centuries, these maps from the colonies appeared in print with some regularity for the benefit of the WIC directors and the plantation owners. The owners and the location of their sugar plantations were recorded with each printing in the map legend or an accompanying register.

Leggerkaarten were made of early Dutch colonies in America, such as Brazil, by Georg Marcgraf, and Nieuw

Nederland, by Augustijn Heerman (Herrman). The maps were published by Joan Blaeu and Johannes Janssonius, respectively. Although no boundaries of the estates are given on the maps of Brazil and Nieuw Nederland, they do appear on later Dutch maps of colonies in the Guianas.

When the new Governor Cornelis van Aerssen van Sommelsdijck came to Surinam in 1683, the surveying and mapping of the colony were made priorities. In 1684, he ordered a new survey of all plantations and an improved demarcation of the borders. The survey was done by Cornelis Boogaert, who, after finishing this job, retired on his plantation.

During the summer of 1688, a *leggerkaart* of Surinam was engraved in Amsterdam by the publisher Frederick de Wit. On this map, the lots are oriented correctly for the first time, reduced proportionally, and depicted in the proper relationship to one another (fig. 46.11). On this and later maps, one can see that the described system of land allotment defines in general lines the cultivated landscape. However, we see many exceptions, such as parcels of land with the long side on a river or parcels traversed by a river. Still, the 1688 map confirms that overseas land surveyors used the method of land distribution developed in the Netherlands during the Middle Ages.

Medium-scale *leggerkaarten* of the different colonies (Dutch Brazil, Nieuw Nederland, and Surinam) were produced between 1640 and 1685 by land-registry offices. These maps summarize the various geopolitical interests of the period: they contain information about indigenous populations, their economic importance, and their political and military inclinations; the creation of settlements with citadels at the mouths of rivers or on the seaboard; the creation of agricultural areas of which the mathematical outlines were marked out by surveyors; and the balance sought between just government, accessibility, and mathematical principles, resulting in long lots.

113. Hendrik van der Linden, *De cope: Bijdrage tot de rechtsgeschiedenis van de openlegging der Hollands-Utrechtse laagvlakte* (Assen: Van Gorcum, 1956).

114. G. J. van Grol, *De grondpolitiek in het West-Indische domein der Generaliteit: Een historische studie*, 3 vols. (The Hague: Algemeene Landsdrukkerij, 1934–47), 2:266, art. V, and Oliver A. Rink, *Holland on the Hudson: An Economic and Social History of Dutch New York* (Ithaca: Cornell University Press, 1986), 94–116. Examples of this practice can also be found in Portuguese colonies. Brazil was divided into *capitanias* (provinces) in the shape of long lots, as shown on a manuscript map by Luís Teixeira, about 1586, illustrated in plate 33 in this volume. See also Max Justo Guedes and José Manuel Garcia, *Te-souros da cartografia Portuguesa*, exhibition catalog (Lisbon: CNCDP, 1997), 94.

115. For a general introduction in English on Dutch cadastral maps of the sixteenth and seventeenth centuries, see Kain and Baigent, *Cadastral Map*, 11–38.

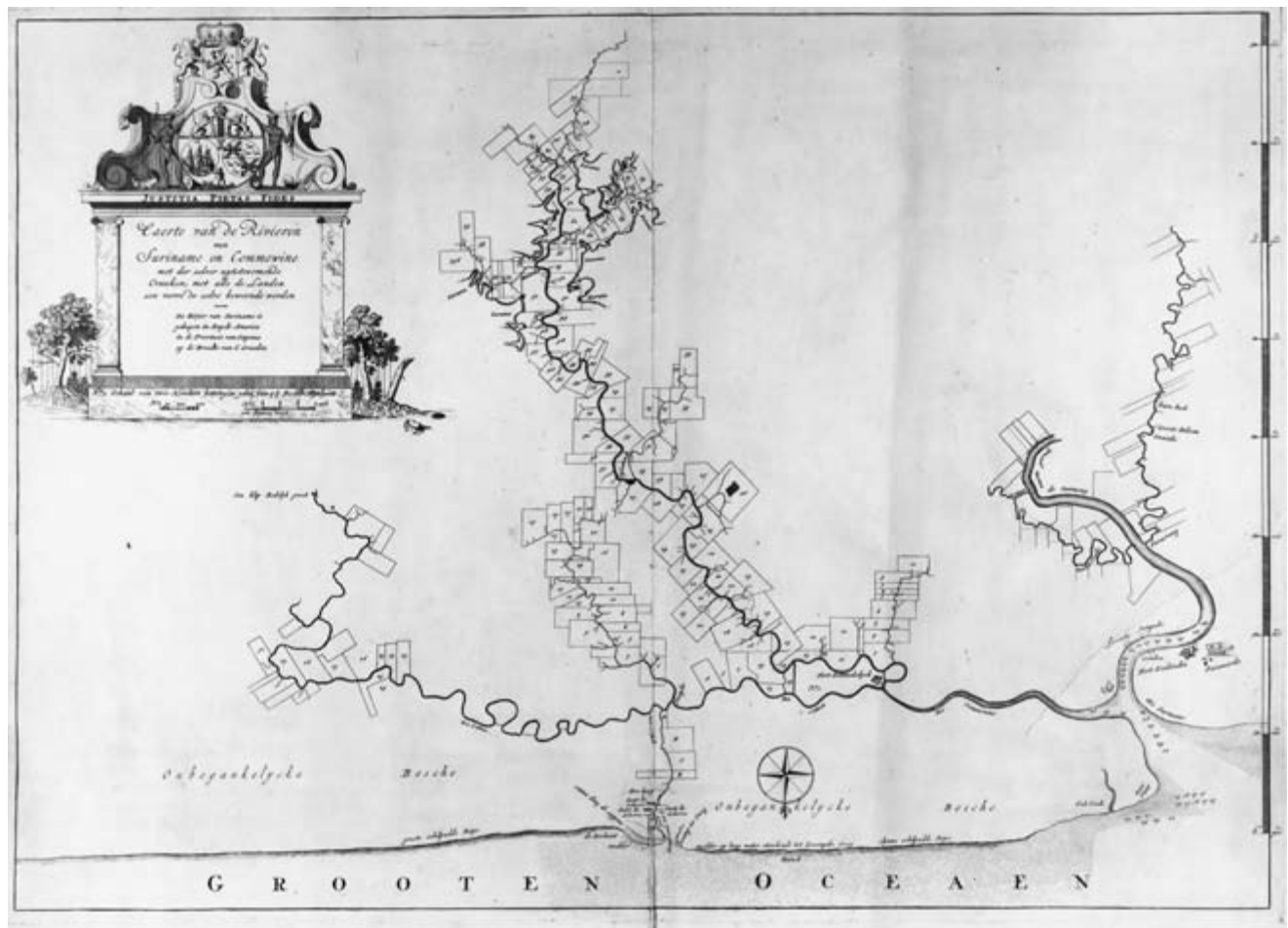


FIG. 46.11. *LEGGERKAART* OF COLONY OF SURINAM, 1688. Made by Cornelis Boogaert, land surveyor, and others; engraved and published by Frederick de Wit in Amsterdam by

orders of the WIC.

Size of the original: 50 × 69 cm. Photograph courtesy of the NA (VEL 1670A).

THE RHETORICAL ROLE OF COMPANY MAPS

The Companies' trade activities were high-risk and very lucrative. The risks were taken by an elite group of merchants who controlled overseas cartography. Not only did they need maps and charts for efficient navigation and the planning of effective fortresses, but they also considered maps and topographic paintings effective vehicles to promote their activities and to establish their historic role. In the Atlantic theater, reference maps showing places, plantations, and rivers were used to attract colonists. Semi-official news maps were published to gain support for the war overseas and to raise funds. WIC directors exercised control over the content of some of these news maps before they were printed.

Art-loving technocrats and merchants ordered manuscript maps, wall maps, and landscape paintings from a

small group of artists who specialized in views and maps that skillfully combined mathematical techniques with aesthetically pleasing drawing, a combination countering the modern view that cartography and art were separate skills or disciplines. Quite often these artists had never been to the place depicted in their scenographic view or map, using views, plans, and maps made by local servants of the Companies as sources. In the art history and cartography literature, these artists are mentioned as marine or landscape painters or as mapmakers.

Interiors richly decorated with Asian and Atlantic wall maps and topographic paintings could be found in the offices of the Companies and the palaces of the stadtholder (fig. 46.12). During the 1660s, one can estimate that each VOC and WIC office in the Netherlands was decorated with ten to sixty paintings and wall maps. At least thirty topographic paintings with overseas themes decorated the

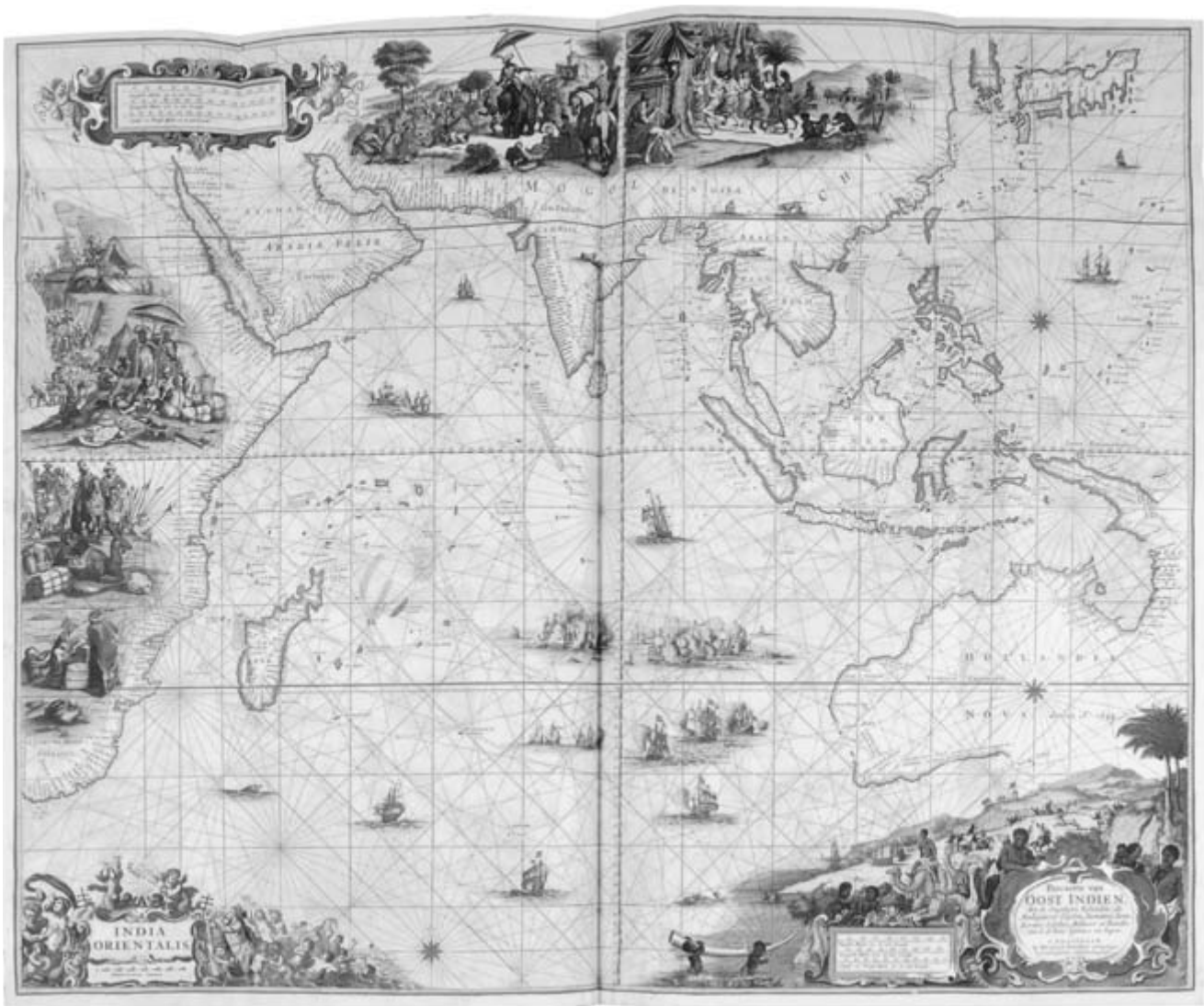


FIG. 46.12. DECORATIVE CHART OF THE INDIAN OCEAN, 1660S. This chart, suitable for framing and hanging, was published by Hendrik Doncker the elder.

Photograph courtesy of the Museum Meermanno-Westreenianum, The Hague (MMW 24 C 5).

palaces of Stadtholder Frederick Henry.¹¹⁶ A number of these paintings and wall maps were variants of one prototype, but no fewer than eighty to one hundred different prototypes must have existed. Today only a few of the actual topographic paintings exist as paintings, but we can get an idea of their appearance from other versions. The extant paintings and documents indicate that the corpus of paintings is closely related to the watercolor genre that existed in much larger numbers. In the various Vingboons collections alone, we find about 180 prototypes of horizontal views (figs. 46.13 and 46.14), perspective (scenographic) views, and orthographic plans and maps complemented by numerous other prototypes in the Atlas Blaeu–Van der Hem. Many of these watercolors also

once existed in the form of oil paintings. Painters used the Blaeu/Vingboons archives to obtain models for their paintings.

The Companies and the stadtholder saw the wall maps and topographic paintings as accurate and monumental commemorations of the overseas history of their times. These works were proudly shown to visitors, some of whom, such as Cosimo III de' Medici and Frederick Augustus I, elector of Saxony, were truly impressed and or-

116. The VOC estimates are based on archival sources; the WIC data are more sketchy but still supported by documentary evidence (Zandvliet, *Mapping for Money*, 227). On Frederick Henry's display of topographic paintings, see C. W. Fock, "The Princes of Orange as Patrons of Art in the Seventeenth Century," *Apollo* 110 (1979): 466–75.

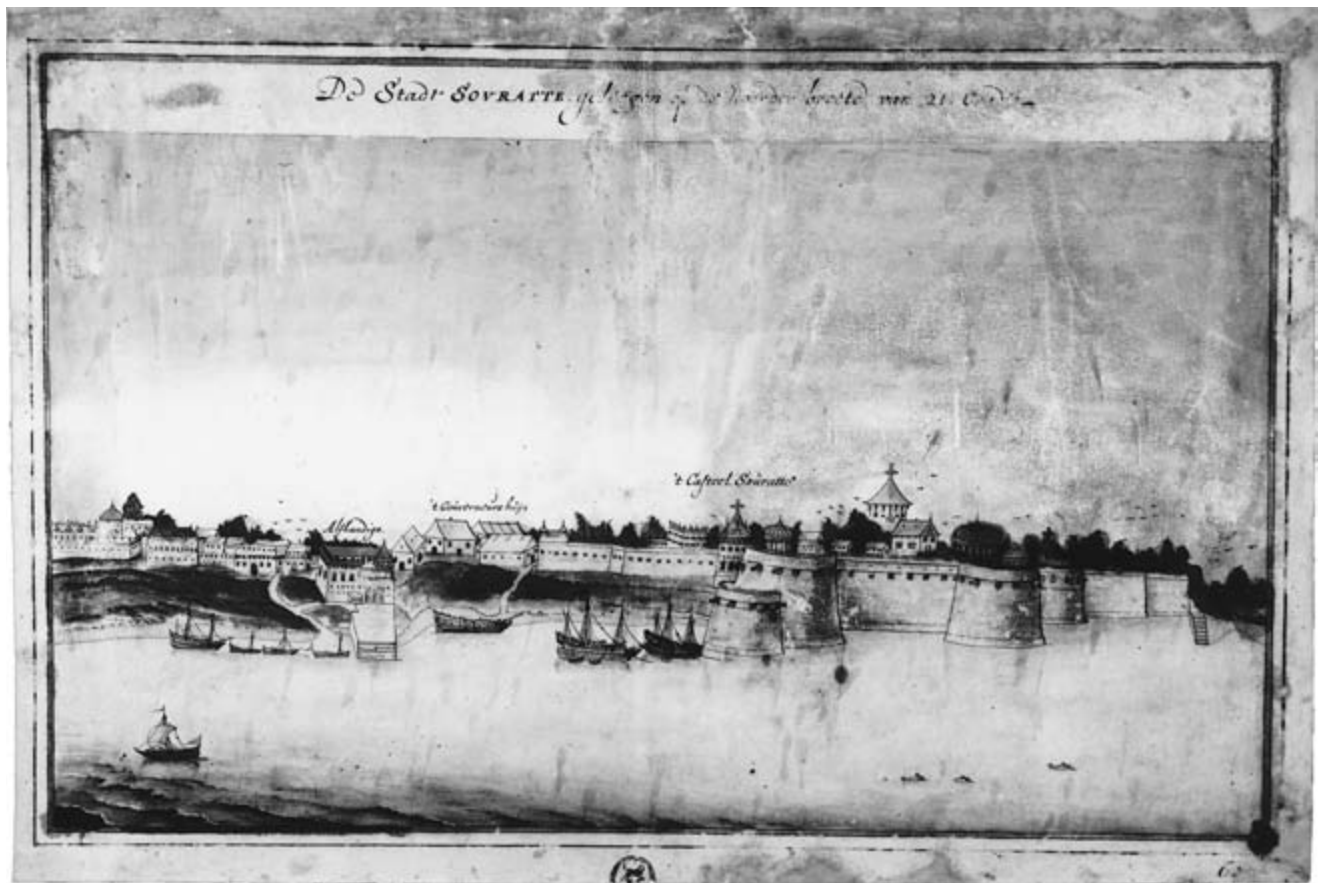


FIG. 46.13. WATERCOLOR VIEW OF A CITY CALLED SURAT BY VINGBOONS. This view, painted in the 1660s, was ordered by Cosimo III de' Medici. It is probably a view of Bijapur, a city upstream from Surat. Compare with figure 46.14.

Size of the original: 35.5 × 57 cm. Biblioteca Medicea Laurenziana, Florence (Carta di castello 58; in this library cataloged as part of the Villa Castello Collection and probably still known as a view of Surat). By concession of the Ministero per i Beni e le Attività Culturali.

dered copies of these series to decorate their own palaces.¹¹⁷

Early in the seventeenth century, these cartographic commemorations at times led to heated debates. The painted map of Amboina, dedicated to the staunch Calvinist Frederik de Houtman, was considered by a moderate director such as Aernoud van Buchell as an act of aggression against the conqueror of Amboina, Steven van der Haghen. Such conflicts may have inspired the directors and Vingboons to produce more neutral depictions of overseas places.

CONCLUSION

In the Dutch Republic, chartmaking never became exclusive to the VOC's organization. Hessel Gerritsz. and his successors remained active as independent cartographers and publishers. The Blaeu family, who succeeded Gerritsz., exploited their monopolistic position within the VOC, and to some extent within the WIC, to strengthen

their own commercial activities. The position of the Blaeus gave them access to cartographic information from around the world, and the charts they delivered to the Companies provided considerable profits. They were hardly hindered by the policy of secrecy, which lost much of its meaning shortly after 1620.

The VOC charts of the Blaeus, the manuscript atlases by Joannes Vingboons, and the manuscript sheets in the Atlas Blaeu–Van der Hem, most produced in the middle and the second half of the seventeenth century, have been considered “secret maps.”¹¹⁸ Due to the limited docu-

117. Zandvliet, *Mapping for Money*, 271, based on Wieder, *Monumenta Cartographica*, 4:130–33, and the entry, “Schilderijen behoorende aan de oostindische comp^e,” *De Navorscher* 14 (1864): 211.

118. On Van der Hem and his atlas, see Roelof van Gelder, “Een wereldreiziger op papier: De atlas van Laurens van der Hem (1621–1678),” in *Een wereldreiziger op papier: De atlas van Laurens van der Hem (1621–1678)*, exhibition catalog ([Amsterdam]: Stichting Koninklijk Paleis te Amsterdam, Snoeck-Ducaju and Zoon, [1992]), 9–21. For the arguments concerning secrecy in relation to charts, the Vingboons

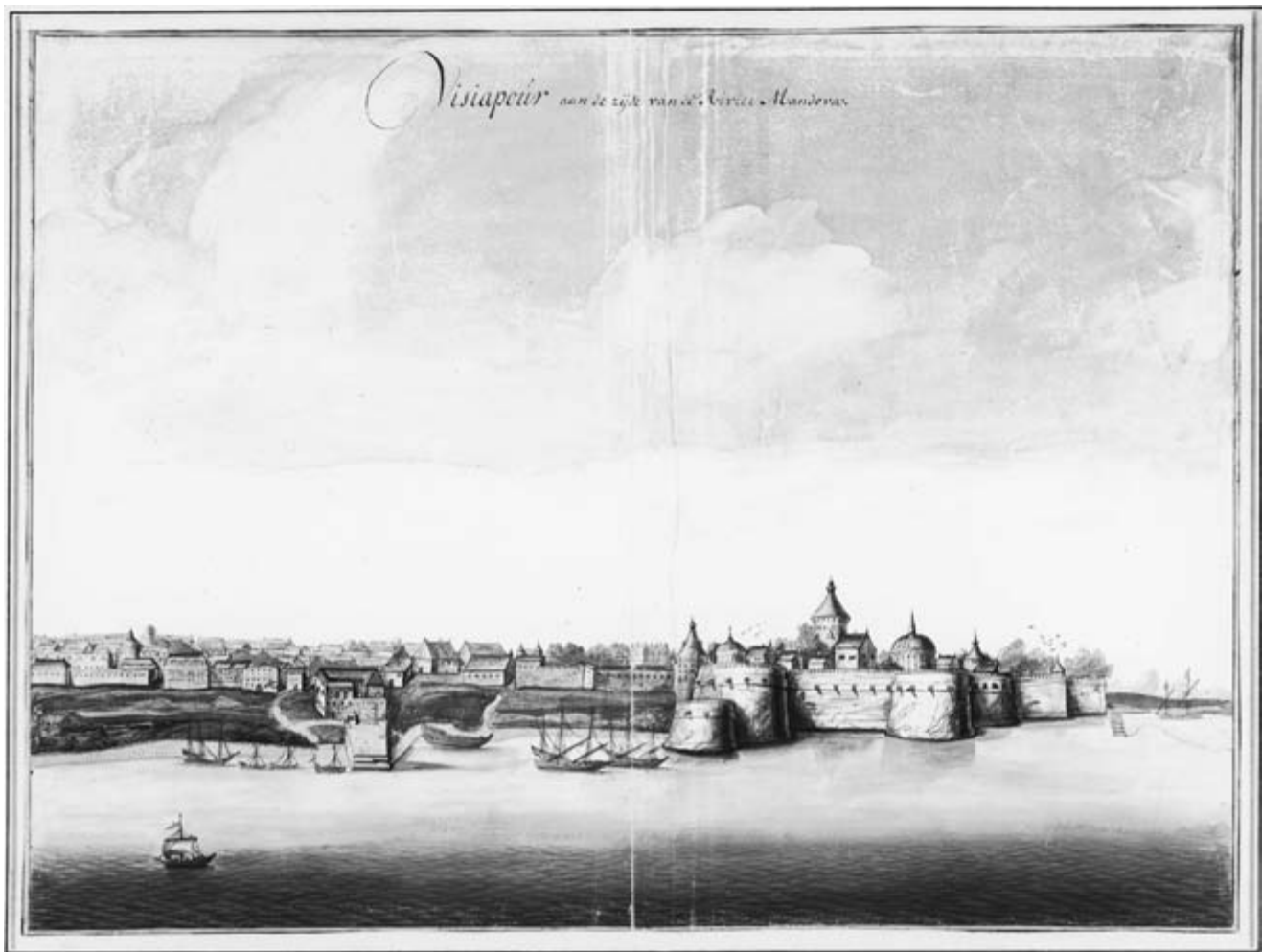


FIG. 46.14. WATERCOLOR VIEW OF BIJAPUR BY VINGBOONS, 1660S. Compare with figure 46.13. An oil painting of Bijapur, similar to this watercolor of the city, decorated the

East India House.

Size of the original: 44 × 59 cm. Photograph courtesy of the NA (VELH 619-105).

mentary sources, scholars have given too much weight to the few known VOC resolutions concerning this issue, concluding that the VOC's secrecy clause in Gerritsz.'s 1619 contract was valid for the entire seventeenth century. Other resolutions, such as those concerning the return of loaned charts, have also been interpreted as evidence for secrecy and not in terms of simple economics. However, instructions to submit charts and instruments after the return of a ship had less to do with secrecy than with improving efficiency and guaranteeing the efficient re-use of expensive supplies.

Scholars have also tried to link secrecy to the relatively large number of manuscript maps collected by Laurens van der Hem and others, reasoning that such maps were held by jealous collectors who had somehow obtained them illegally from the VOC (and WIC) archives through Joan Blaeu and Joannes Vingboons and who would show them to others only in strict confidence.¹¹⁹ It makes much

more sense to accept such maps and charts as simply exclusive rather than secret. Manuscript charts and maps almost always circulated in smaller numbers than printed maps and charts; their numbers were lower and their prices higher. As exclusive items, they were collected and prized.

The maps and charts, both printed and manuscript, reflected different conditions on the ground within the VOC and WIC jurisdictions. There was more uniformity in legislation and methodology overseas than in the Dutch Republic. This emphasis on rational planning overseas is evident from the more pragmatic town construction, land organization, and construction of fortifications based on

atlases, and the Atlas Blaeu–Van der Hem, see Wieder, *Monumenta Cartographica*, 5:145–52; Schilder, “Hydrographic Office,” 61; and Van Bracht's introduction to *Atlas van kaarten*, 4–5.

119. Schilder, “Hydrographic Office,” 70.

the ideas of scientists like Simon Stevin, who in turn were influenced by Roman and Italian thought. A “flexible pre-fab” method of town planning allowed for compromises to be made between an ideal, standardized approach and the local circumstances of the place. The entire cadastral system in the chartered territory used one standard of measurement—the Rhineland rod. The Companies regarded cadastral maps (*leggerkaarten*) and town plans as essential instruments for management and planning.

Until the middle of the seventeenth century, WIC map-makers Joan Blaeu and Joannes Vingboons dominated in both functional and decorative cartography of the Atlantic area. Impressive displays of their cartographic knowledge and skill include the printed topographic maps of Nieuw Nederland and Brazil and the manuscript maps in the circa 1650 Christina atlas.

Although the available corpus of maps of overseas territories is relatively rich, the number of paintings is ex-

tremely low, giving a biased impression of the mix and relative functions of the maps and paintings. Most large-scale maps produced and used locally, once kept in the offices of *fabrieken* overseas, have been lost, as have all but a handful of the thousands of charts once used on the VOC and WIC ships. When the Dutch Republic became a part of the French Empire, most of the cartographic material of the former Companies was moved to France; only a small portion was returned to the Netherlands.

Nevertheless, some knowledge about the lost charts can be gathered from decorated offices, topographic maps, and copies of lost oil paintings. The few artifacts that remain have allowed us partly to reconstruct and understand something of the corpus that once existed.¹²⁰

120. The most important collection can be found in the NA.