7 • The Renaissance Chart Tradition in the Mediterranean

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Introduction

Medieval nautical charts were adequate for the needs of the navigators of the day, who sailed the Atlantic and Mediterranean coasts of Europe along well-established routes that were in part determined by the nature of local winds and currents and never led to ships' losing sight of land for more than two or three days.[1] Yet in addition to being important working tools, these charts were also the documents that recorded the first achievements of Atlantic exploration, indicating newly discovered archipelagos and the gradually emerging features of the coast of Africa. Ultimately, the conquest of the oceans made navigation by the stars a necessity, and thus indications of latitude—along with the equator and the Tropics—were added to the old rhumb line charts, gradually transforming them into flat gridded charts that, even though nonisogonic (and therefore inadequate to the needs of ocean-going navigators), would remain in use for more than a century.[2] From as early as the beginning of the sixteenth century, Portugal and Spain had public bodies—known, respectively, as the Casa da Mina and the Casa de la Contratación—responsible for drawing up these large nautical world charts, which recorded each new geographical discovery and thus made regular changes to the image of the world.[3]

Within the Mediterranean area itself, ships continued to ply the same routes, and, for a century at least, the shipping trade suffered no ill effects from the opening of ocean routes. Changes, however, were felt—especially during the course of the sixteenth century: merchant galleys tended to disappear, and the large galleons gradually lost out to a significant number of small sailing ships that made frequent stops and carried all kinds of merchandise (clear proof of extended economic well-being in the area).[4]

The sixteenth and seventeenth centuries were also a period of almost uninterrupted war within the Mediterranean area, with not only such large-scale battles as those of Djerba and Lepanto, but also continuous raids, skirmishes, and acts of piracy (the latter leading to extensive patrols to protect merchant shipping). In such a situation, the need for expert navigators and adequate equipment was obvious. Sailing routes tended to hug the coast, and thus sailing them required special techniques and capacities—as Juan de Escalante de Mendoza recognized when he distinguished between sailors plotting courses for coastlines (*de costa y derrota*) and those for deep seas (*de altura y escuadría*), each group with their own skills and aptitudes.[5]

For more than two centuries the large cities and smaller ports of the Mediterranean continued the medieval tradition of producing manuscript portolan charts and atlases organized around the distribution of wind rhumbs.[6] These charts were generally produced in small family workshops; the traditional art of making charts and images for navigation was handed down from generation to

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Abbreviations used in this chapter include: *Carte da navigar* for Susanna Biadene, ed., *Carte da navigar: Portolani e carte nautiche del Museo Correr, 1318–1732* (Venice: Marsilio Editori, 1990).

1. John H. Pryor, *Geography, Technology, and War: Studies in the Maritime History of the Mediterranean, 649–1571* (Cambridge: Cambridge University Press, 1988), 87–101.

2. Joaquim Bensaúde, *L'astronomie nautique au Portugal à l'époque des grandes découvertes,* 2 vols. (Bern: M. Drechsel, 1912–17; reprinted Amsterdam: N. Israel and Meridian, 1967), and W. G. L. Randles, "De la carte-portulane méditerranéenne à la carte marine du monde des grandes découvertes: La crise de la cartographie au XVI^{e} siècle," in *Géographie du monde au Moyen Âge et à la Renaissance,* ed. Monique Pelletier (Paris: Éditions du C.T.H.S., 1989), 125–31, esp. 128. The author defines this change as a *mariage contre nature.*

3. David Turnbull, "Cartography and Science in Early Modern Europe: Mapping the Construction of Knowledge Spaces," *Imago Mundi* 48 (1996): 5–24, esp. 7.

4. Fernand Braudel, *The Mediterranean and the Mediterranean World in the Age of Philip II,* 2 vols., trans. Siân Reynolds (New York: Harper and Row, 1972–73), 306–12.

5. Juan de Escalante de Mendoza, *Itinerario de navegación de los mares y tierras occidentales, 1575* (Madrid: Museo Naval, 1985), 47.

6. "Nonetheless, manuscript cartography continued to prosper; indeed, judging from the material that has come down to us, one could say that it flourished as never before. Instead of demand dropping as a result of the availability of printed maps, it increased. All that changed was the character of such cartography." Giuseppe Caraci, "Cimeli cartografici sconosciuti esistenti a Firenze," *Bibliofilia* 28 (1927): 31–50, esp. 48.

The term "portolan chart," although vehemently avoided by some historians (see Patrick Gautier Dalché, "Portulans and the Byzantine World," in *Travel in the Byzantine World,* ed. R. J. Macrides [Aldershot: Ashgate, 2002], 59–71, esp. 59), is used here to provide continuity from its use in volume 1 of the *History of Cartography* series.

generation.[7] And the charts these family workshops produced reveal a real sense of continuity, with the Mediterranean maintaining its central position in the world even after the opening of the Atlantic and the waters beyond. Large world charts are rare and limited to the early decades of the sixteenth century. Generally, output comprised numerous charts and atlases that, as in the Middle Ages, showed only the Mediterranean area[8] and nautical atlases that included only a small world chart or dedicated just a few small sheets to the oceans and continents beyond Europe while continuing to focus on the Mediterranean, which was covered by larger and more numerous charts.

Charts of a single area—such as the Black Sea, the Aegean, or the Adriatic—were also a rarity. The reader was therefore given a picture of the Mediterranean as a unit; more than a simple, unified physical site with a common climate, the area was portrayed as a common locus of human activity, a unit held together by a fine weave of sea routes. And a key component here was less the sea itself than the people who plied it—who, in spite of the conflicts and hostilities that riddled the region, did not hesitate to move from one place to another if that gave them a better chance to practice their art or craft.[9] This was certainly true of cartographers, who during these two centuries were continually on the move from one Mediterranean port to another in search of new patrons or customers. However, except in some very rare cases, this free movement did not lead to ready exchanges with cartographers charting other areas. For example, in Spain there was a sharp separation between the cartography of the Casa de la Contratación, which focused on the New World and the production of large world charts, and the work of the Catalan cartographers, who maintained the traditional focus on the Mediterranean. The same thing can be seen in France, with an equally sharp division between the work of the so-called École du Ponent and that of the cartographic workshops of Marseilles and Toulon: very few cartographers seem to have moved from one school to the other, switching their attention from the Mediterranean to the Atlantic, or vice versa.[10] This particular feature of contemporary cartography suggests that a discussion of Mediterranean nautical charts should not deal with them according to national groups but rather look at them as a whole, covering all the charts produced in the cities and ports of the Mediterranean (which, as we have already seen, tended to focus their attention on that sea alone).

The fact that a nautical chart or atlas was produced in one of these ports must have reassured possible customers as to its quality, and this may explain why there are traces that show cartographers frequently moving from one of these cities to another but not choosing to live and work in the cultural capitals of the day (e.g., Florence), where they might have encountered many more potential clients. The extensive mobility of Mediterranean cartographers appears, in fact, to have been largely due to an unending search for better markets for their products and, even more important, for more favorable working conditions. Such conditions were often determined by the policies of local governments, which might vary from direct public control (leading to the creation of family monopolies and the emigration of excluded talent) to a more open, laissez-faire regime (favoring new input of energy from outsiders).[11]

The period under discussion, the sixteenth and seventeenth centuries, could be said to have opened with the so-called Map of Columbus (fig. 7.1) and to have closed with Filippo Francini's atlas of 1699. The former—whose exact date and attribution are matters of debate[12]—undoubtedly comes from sometime around the end of the fifteenth century and the beginning of the sixteenth and is a perfect example of the transitional phase of Mediter-

7. Giovanna Petti Balbi, "Nel mondo dei cartografi: Battista Beccari maestro a Genova nel 1427," in *Columbeis I* (Genoa: Università di Genova, Facoltà di Lettere, Istituto di Filologia Classica e Medievale, 1986), 125–32.

8. Nordenskiöld popularized the phrase "area of the normal portolan," indicating the geographic area described on portolan charts and represented on medieval nautical charts. It usually included the entire Mediterranean, the Black Sea, and a small part of the Red Sea. The coast of the Atlantic varied, extending in the south to the Canaries and in the north to "Cabo Finisterre" or to Denmark, with complete representation of Britain and in some cases southern Scandinavia (A. E. Nordenskiöld, *Periplus: An Essay on the Early History of Charts and Sailing-Directions,* trans. Francis A. Bather [Stockholm: P. A. Norstedt & Söner, 1897], 16–17 and 45). We have chosen to use "area of the Mediterranean," meaning this larger geographic region.

9. Braudel, *Mediterranean,* 276. See also Alberto Tenenti, "Il senso del mare," in *Storia di Venezia,* vol. 12, *Il mare,* ed. Alberto Tenenti and Ugo Tucci (Rome: Istituto della Enciclopedia Italiana, 1991), 7–76.

10. Among the exceptions one should mention there are, for example, Diogo Homem, who moved to Venice after a period of work in Lisbon, and Pierre Collin of St. Malo, who drew up an atlas in Marseilles in 1642.

11. This is why the chapter is divided according to centers of production rather than families of cartographers, which would have risked reducing it to a mere list of names. In fact, once one goes beyond the two family dynasties of the Maggiolo and the Oliva, there are a host of individual cartographers (or, at most, father-son pairs) who are best seen in reference to the place where they worked.

12. At the Cairo International Geography Conference, Charles de La Roncière attributed an anonymous chart—(FrP1bis)—to Christopher Columbus, claiming it must have been the very one the navigator used to convince the Spanish sovereigns during the siege of Granada. Charles de La Roncière, *La carte de Christophe Colomb* (Paris: Les Éditions Historiques, Édouard Champion, 1924); idem, "La carte de Christophe Colomb," in *Congrès international de géographie, Le Caire, avril 1925: Compte rendu,* 5 vols. (Cairo: L'Institut Français d'Archéologie Orientale du Caire pour la Société Royale d'Égypte, 1925–26), 5:79–83; idem, "Une carte de Christophe Colomb," *Revue des Questions Historiques,* 3d ser., 7 (1925): 27–41; and idem, "Le livre de chevet et la carte de Christophe Colomb," *Revue des Deux Mondes,* 8th period, 5

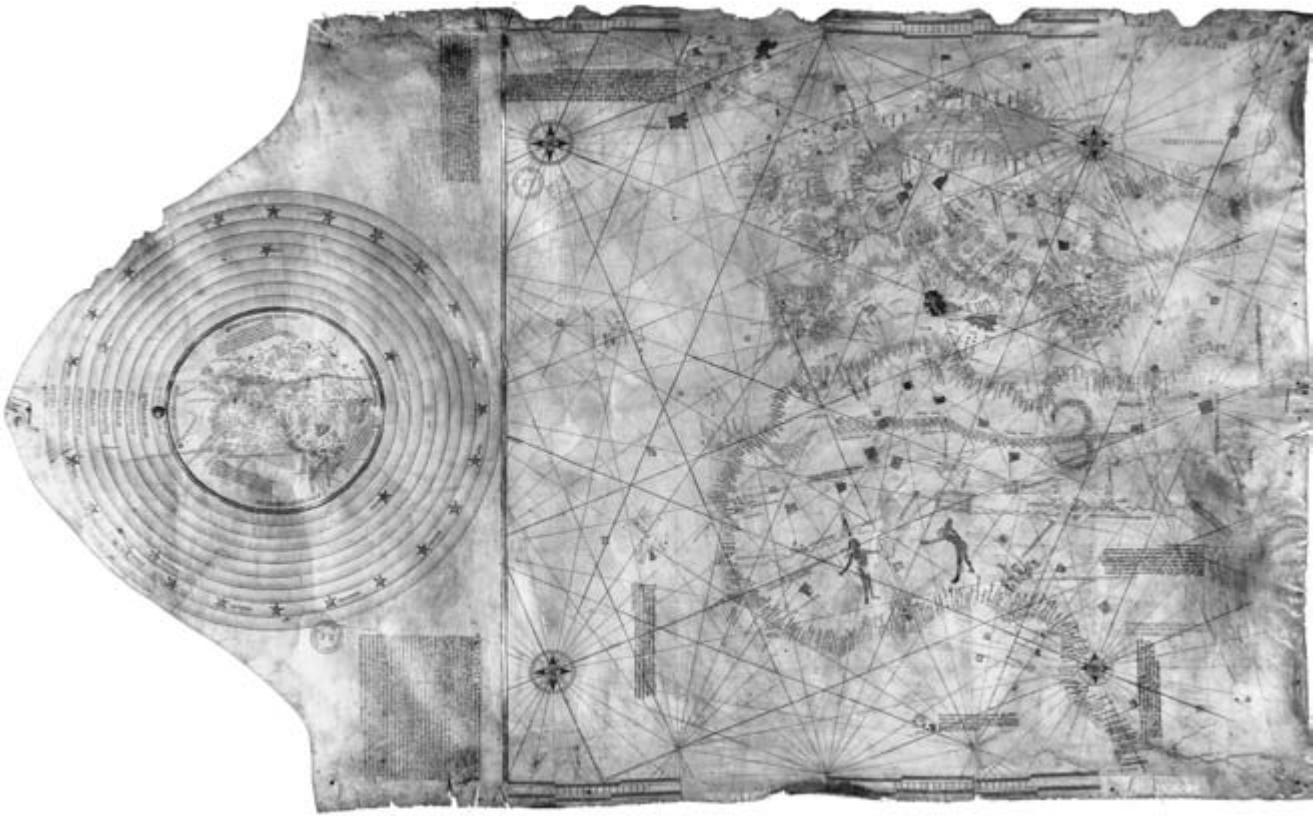

FIG. 7.1. THE MAP OF COLUMBUS. An anonymous, undated nautical chart produced toward the end of the fifteenth or the beginning of the sixteenth century. La Roncière identifies it as the map used by Christopher Columbus to outline his project of exploration to the Spanish sovereigns (Charles de La Roncière, *La carte de Christophe Colomb* [Paris: Les Éditions Historiques, Édouard Champion, 1924]).
Size of the original: 70 × 110 cm. Photograph courtesy of the BNF (Rés. Ge AA 562).

ranean cartography, when it had to take account of the Atlantic: in fact, it not only covers the area of the Mediterranean but also stretches south as far as the Zaire River (Congo) and west beyond the Atlantic archipelagos. However, it still shows the Septem Civitatum Insula—the mythical Island of the Seven Cities—while the small circular *mappamundi* on the neck of the parchment continues to reflect the Ptolemaic worldview and, though recording the results of Bartolomeu Dias's expedition, does not go beyond the tripartite division (the three continents of the Old World) traditional in medieval cartography. Francini's 1699 atlas (AW9),[13] on the other hand, is a visually appealing work that is really a demonstration

(1931): 423–40, esp. 432–40. The scholar based his argument on a series of factors, the most important of which was that the legend to the chart contains the solecism *de ibi* instead of *inde*—a form that the author argues could be found only in a postil added by Columbus. However, it is not found as infrequently as he assumed, given that it can also be found in the so-called Usodimare Letter: see Alberto Magnaghi, *Precvrsori di Colombo? Il tentativo di viaggio transoceanico dei Genovesi Fratelli Vivaldi nel 1291* (Rome: Società Anonima Italiana Arti Grafiche, 1935), 31 n. 5. The lively debate that followed involved a number of Italian scholars: Roberto Almagià, "Una carta attribuita a Cristoforo Colombo," *Rendiconti della R. Accademia Nazionale dei Lincei: Classe di Scienze Morali, Storiche e Filologiche,* 6th ser., 1 (1925): 749–73; Giuseppe Caraci, "Una carta attribuita a Colombo," *Rivista Geografica Italiana* 32 (1925): 280–87; idem, "Sulla data della pretesa carta di Colombo," in *Atti del X Congresso Geografico Italiano* (Milan, 1927), 1:331–35; Cesare de Lollis, "La carta di Colombo," *La Cultura,* 1925–26, 749–75; and Camillo Manfroni, "La carta di Colombo," *Rivista Marittima* 58 (1925): 705–13. La Roncière's claim was heavily criticized and then discarded. However, in 1952 Destombes returned to the question in Marcel Destombes, "Une carte interessant les études colombiennes conservée à Modène," in *Studi colombiani,* 3 vols. (Genoa: S.A.G.A., 1952), 2:479–87. His examination of an anonymous chart fragment in the Biblioteca Estense in Modena led him to point out several similarities between that work and the Paris chart, and finally to attribute both to Bartholomew Colombus. More recently, Pelletier has argued that one cannot rule out an attribution to the admiral or his brother, while Luzzana Caraci has argued that the chart was produced in an Italian workshop between the end of the fifteenth and the beginning of the sixteenth century. Monique Pelletier, "Peut-on encore affirmer que la BN possède la carte de Christophe Colomb?" *Revue de la Bibliothèque Nationale* 45 (1992): 22–25, and Ilaria Luzzana Caraci, "A proposito della cosiddetta 'carta di Colombo,'" in *Oriente Occidente: Scritti in memoria di Vittorina Langella,* ed. Filippo Bencardino (Naples: Istituto Universitario Orientale, 1993), 121–47.

13. The code for this chart (AW9) is found in appendix 7.1, a preliminary list of manuscript charts and atlases made in Mediterranean workshops in the period 1500–1700.

of nothing other than cartography as an exercise in style. Hence, it can quite justly be considered symbolic of the end of this centuries-old type of cartography.

Extant Works

The number of sixteenth- and seventeenth-century nautical charts and atlases that have survived to the present day is almost four times as great as that of similar works dating from the previous two centuries (see appendix 7.1 for a complete list of charts of the Mediterranean in public collections, 1500–1700). Campbell has counted a total of about 180 such charts from the Middle Ages, and, in spite of the difficulties in dating anonymous works that fall on the borderline between the two periods, his list appears to be as complete as possible.[14] Things are very different when one tries to list the works dating from the first two centuries of the modern period. The number of those in public collections alone exceeds 650—and, given that a number of works are scattered among numerous small museums and libraries (and some may therefore slip through the net), it is impossible to give an exact figure.[15] There are also those in private collections; again, although we know there are at least one hundred, an exact figure is impossible because of many collectors' reluctance to advertise the treasures in their possession. One should also bear in mind that, for some time now, at least three or four such charts have gone up for auction each year—and perhaps as many again change hands privately.

According to Campbell, the number of extant medieval charts represents a small fraction of those actually produced. Many of those used on board ship were ultimately destroyed by wear and tear, humidity, and saltwater, and many of those consulted in the safety of dry land were decimated by goldsmiths, tailors, gluemakers, and bookbinders, who were all eager to recycle their parchment.[16] The same would, of course, be true for the nautical charts produced in the early centuries of the modern period. However, it remains to be seen whether the output of that period really was four times as great as that of the Middle Ages or—for some reason—the survival rate for these later charts was much higher.

It is, in fact, possible that from the second half of the sixteenth century onward there was a gradual decline in the output of those unadorned charts produced for shipboard use, which were simply thrown away when worn to tatters, and a proportional increase in the output of decorative charts, which may have had various purposes but certainly remained ashore and were looked after with more care. The trend toward small-volume merchant shipping meant there was practically no need for nautical charts of the Mediterranean as a whole; on short coastal voyages from one port to another, what counted was the personal experience of captains and pilots.

At the same time, there was a sharp upturn in the number of people buying ornamental charts. Although, as the annotations to these charts make clear, their purchasers were often those who worked the sea, it seems highly unlikely that these decorative charts could have been used for actual navigation; not a single extant chart of this kind bears traces of such use, and the large water stains on some of the surviving charts are not necessarily proof that they were kept on board ship for a long time.[17] Indeed, given that such stains are normally accompanied by moth holes and the damage caused by rodents, they seem to indicate neglectful maintenance ashore rather than use on board a ship.[18]

The domestic conditions of the period—together with the action of parasites and the inaction of men—form the main explanation for the disappearance of such works as the "sailor's chart," which Baldassare Maggiolo sold to Don Carlo, second-born son of Prince Giovanni Andrea Doria, in 1592,[19] or the entire output of Cornelio, Nicolò, and Cornelio II Maggiolo, who were the official cartographers to the Republic of Genoa in the seventeenth century. The references in contemporary archives are the only traces of these charts.[20]

The destruction of charts from both the medieval and early modern periods has continued well into this century. During the bombing raids of the Second World War the Biblioteca Trivulziana in Milan lost two charts by Jacopo Russo (dating from 1564 and 1588), plus charts by Matteo Prunes, Pierre Bernard, and Joan Oliva (dating from 1594, 1623, and 1634, respectively). The Biblioteca Ambrosiana in the same city lost Vesconte Maggiolo's 1524 chart of the Mediterranean and his famous two-sheet world chart of 1527.[21] During the same period the Bayeri-

14. Tony Campbell, "Census of Pre-Sixteenth-Century Portolan Charts," *Imago Mundi* 38 (1986): 67–94.

15. Corradino Astengo, *Elenco preliminare di carte ed atlanti nautici manoscritti: Eseguiti nell'area mediterranea nel periodo 1500–1700 e conservati presso enti pubblici* (Genoa: Istituto di Geografia, 1996).

16. Tony Campbell, "Portolan Charts from the Late Thirteenth Century to 1500," in *HC* 1:371–463, esp. 373. The following are only some of the numerous fragments of nautical charts that have been recovered from book bindings: ItJ1, ItMn1, ItSs1, ItBr2, and ItSv2.

17. Compare John Coyne, "Hooked on Maps," *Mercator's World* 1, no. 4 (1996): 20–25, esp. 24, caption to the illustration.

18. That these now highly prized objects were not always held in great regard by those who owned them can be seen from the 1563 atlas by Jaume Olives that was purchased by the Biblioteca Ambrosiana in 1803 (ItMi2ter): on the recto of the first folio, which has come away from the original binding, an unknown hand has jotted down a few calculations and also copied a recipe for cassia water.

19. Cornelio Desimoni, "Elenco di carte ed atlanti nautici di autore genovese oppure in Genova fatti o conservati," *Giornale Ligustico di Archeologia, Storia e Belle Arti* 2 (1875): 41–71, esp. 62–63.

20. Arturo Ferretto, "I cartografi Maggiolo oriundi di Rapallo," *Atti della Società Ligure di Storia Patria* 52 (1924): 53–83, esp. 74–82.

21. Paolo Revelli, "Cimeli cartografici di archivi di stato italiani distrutti dalla guerra," *Notizie degli Archivi di Stato* 9 (1949): 1–3.

sches Armeemuseum in Munich lost all its early charts, including a 1511 work by Salvat de Pilestrina and an anonymous (probably Catalan) work generally dated from the beginning of the sixteenth century. More recently, a six-chart atlas by Julianus Graffingnia disappeared from the Marseilles Bibliothèque Communale St. Charles some decades ago.[22] Numerous works mentioned as being in private collections before 1940 have since disappeared: the Pietro Russo chart that Uzielli and Amat di S. Filippo mention as being in the collection of Conte Merenda of Forlì has been missing since the Second World War,[23] and the entire collection of the Florentine family of Orsini has disappeared without a trace.

However, there are also works that were long considered lost but have suddenly come to light: the Baldassare Maggiolo chart that Desimoni and Uzielli and Amat di S. Filippo mentioned as being in the collection of an unnamed private library in Ventimiglia reappeared after a century as one of the lots at the Macoïr-Bailly auction in Paris, while the Battista Agnese atlas mentioned by Placido Zurla as being the property of Abbé Celotti was declared by Wagner to have been lost and only recently has been identified as the atlas that formerly belonged to Prince Lobanov Rostovski and is now in St. Petersburg (RP2).[24] So there is perhaps hope that other works given up as lost will eventually make their reappearance.

Customers and Patrons

Sometimes nautical charts and atlases were commissioned directly; but perhaps it was more usual for the cartographic workshops to produce them at their own expense, in the hope of subsequently finding a purchaser. That this practice was common is clear from those atlases of Battista Agnese in which the framed section or scroll that would have borne the owner's coat of arms or heraldic device has been left blank. Wagner lists thirteen such works, to which should be added the Ambraser Atlas (AW1); the number is high enough to rule out any suggestion of mere coincidence.[25] There are other atlases in which the recto of the second sheet has been left totally blank, ready for a coat of arms or the inscription of the owner's name.[26] It is possible that even in cases where there is a coat of arms or name, these were added only after the work had been purchased or received as a gift.

Yet for all their blanks, Agnese's works are those that provide us with the most information on their illustrious purchasers or recipients. One atlas—finely illuminated and with a splendid turquoise-encrusted binding—bears the arms of Charles V on the last sheet;[27] another contains not only a portrait of the emperor and the coats of arms of Castile and Aragon but also the inscription "Philippo Caroli Aug. F. optimo princ. Providentia," and hence is held to have been a gift from Charles to his son, the future Philip II.[28] A third Agnese atlas bears the English coat of arms in one scroll and in another a dedication to Henry VIII—"Henricus octavus dei gratia Angliae, Franciae et Hiberniae rex fidei defensor"—while the inside back cover contains a setting for a small compass decorated with a wind rose (with the names given in English).[29] Other works bear coats of arms or inscriptions revealing that they were the property of such illustrious contemporary figures as Cosimo I de' Medici (ItFi13); Alfonso II d'Este, Duke of Ferrara, Modena, and Reggio (ItBo11); and Admiral Gaspard de Coligny (FrC1), or of high-ranking prelates such as Heronimus Rouffault, Abbot of St. Vaast (USW1); Cardinal Guido Ascanio Sforza of Santa Fiora (ItTo5); Sebastian, Archbishop of Mainz;[30] and Adolph von Schaumburg, Archdeacon of Cologne.[31]

22. The work is signed "Julianus Graffingnia . . . 1568." It would therefore be the oldest nautical atlas compiled in Marseilles. See J. Albanès, *Catalogue général des manuscrits des bibliothèques publiques de France: Départements-Tome XV, Marseille* (Paris: E. Plon, Nourrit, 1892), 317. The news is also given in Marcel Destombes, "François Ollive et l'hydrographie marseillaise au XVII^{e} siècle," *Neptunia* 37 (1955): 12–16.

23. Gustavo Uzielli and Pietro Amat di S. Filippo, *Mappamondi, carte nautiche, portolani ed altri monumenti cartografici specialmente italiani dei secoli XIII–XVII* (Rome: Società Geografica Italiana, 1882; reprinted Amsterdam: Meridian, 1967), 280.

24. RP2. *Bibliothèque d'un Amateur et à divers: Voyages Atlas Histoire Généalogie . . . 7 novembre 1993* (Paris: B. Clavreuil, 1993), 29, item 133. See also Desimoni, "Elenco di carte," 62; Uzielli and Amat di S. Filippo, *Mappamondi,* 154; Placido Zurla, *Di Marco Polo e degli altri viaggiatori Veneziani* (Venice: Giacomo Fuchs, 1818), 368; Henry Raup Wagner, "The Manuscript Atlases of Battista Agnese," *Papers of the Bibliographical Society of America* 25 (1931): 1–110, esp. 99–100; and Battista Agnese, *Vollständige Faksimile-Ausgabe des Portolan-Atlas des Battista Agnese (1546) aus dem Besitz der Russischen Nationalbibliothek in St. Petersburg,* ed. Arthur Dürst (Disentis: Desertina; Graz: Akademische Druck- u. Verlagsanstalt; Moscow: Avtor, 1993), including the supplement by Tamara P. Woronowa, *Der Portolan-Atlas des Battista Agnese von 1546 aus der Russischen Nationalbibliothek Sankt Petersburg,* 25.

25. Wagner, "Manuscript Atlases."

26. The recto of the first folio was generally glued to the front board of the binding. However, as we shall see, nautical atlases usually comprised a series of double sheets, so it would be more correct to speak of the right half of the first double sheet.

27. The atlas once belonged to Baron Edmond Rothschild. See Wagner, "Manuscript Atlases," 61–62.

28. USPo2. Wagner, "Manuscript Atlases," 74, and V.A. Malte-Brun, "Note sur un Portulan donné par Charles-Quint à Philippe II," *Bulletin de la Société de Géographie* 11 (1876): 625–31.

29. V7. Roberto Almagià, *Monumenta cartographica Vaticana,* 4 vols. (Vatican City: Biblioteca Apostolica Vaticana, 1944–55), 1:68, and Wagner, "Manuscript Atlases," 77–78. Here again it is difficult to say whether the work was commissioned or whether the coat of arms, dedication, and English names for the various winds were all added at a later stage.

30. Formerly in the collection of Conte Alex Mörner (Espelunda). Wagner, "Manuscript Atlases," 87. The tome seems to have been given to the archbishop by Christopher Haller of Hallerstein.

31. Harff a/Erft, Schloss-Bibliothek. Wagner, "Manuscript Atlases," 69.

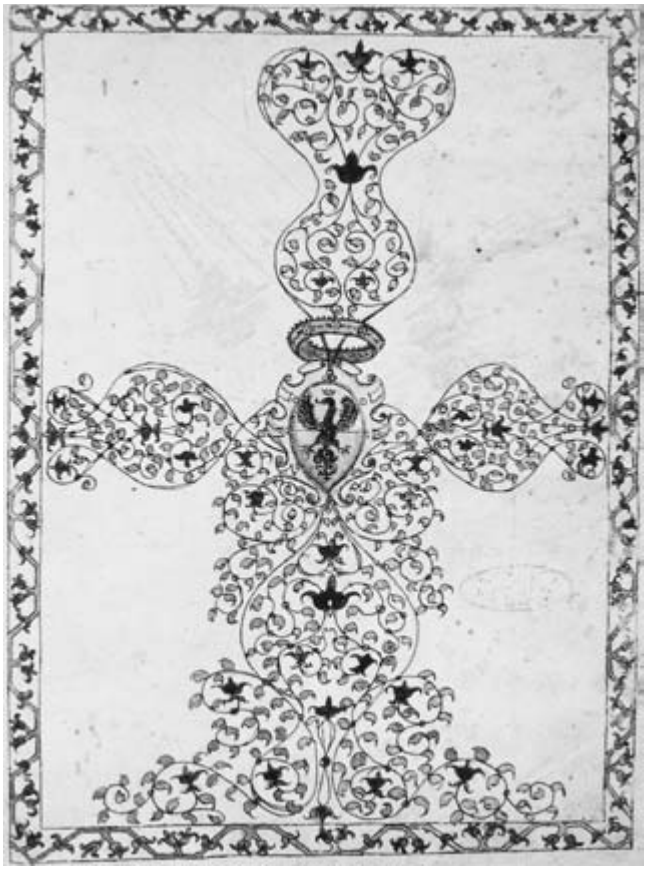

FIG. 7.2. COAT OF ARMS OF THE DORIA FAMILY. Nautical atlas attributed to Francesco Ghisolfi, second half of the sixteenth century.
Size of the original: ca. 33 × 23 cm. Biblioteca Universitaria, Genoa (MSS. G. V. 32, fol. 2r). Authorization granted by the Ministero per i Beni e le Attività Culturali.

Particular mention should be made of the atlas that Tommaso Campeggio, Bishop of Feltre, gave to the famous humanist Paolo Giovio, Bishop of Nocera, in 1541.[32] Other atlases bear the crests of such aristocratic families as the Tron, Sommaja, Barberini, and Hohenlohe-Neuenstein—who may well have come into possession of them long after they were actually produced. As for those charts and atlases in which the scroll panel was left blank, one can either assume that they were bought by nonnoble families or explain the absence of a heraldic device as the result of mere negligence.

The Medici family seems to have been the owners of a number of works by Francesco Ghisolfi, who is considered to have been Agnese's pupil.[33] The Riccardiana atlas 3616 (ItFi30) may bear an unidentified coat of arms on the front cover (which is then repeated in the middle of the decorative border running down the left and right sides of each page), but it is known to have belonged to Cosimo I, who presented it as a gift to his son Francesco (as can be seen from the curious dedication in Latin playing on the words *Cosmo* and *Cosimo*). Another Riccardiana atlas, 3615 (ItFi29), however, has a Medici coat of arms on its frontispiece—probably that of Cardinal Ferdinand de' Medici—while another (UKO8) bears a parted crest with the arms of the Medicis and the House of Austria and seems to have been one of the wedding gifts at the marriage of Francesco de' Medici to Joanna (Giovanna) of Austria in 1565.[34] One should also mention the atlas that bears the Doria coat of arms (fig. 7.2) and is claimed to have been the property of Giovanni Andrea Doria.[35] Finally, there is an atlas whose inside cover bears a long autograph annotation by its owner Andrea Baldi (FrP20). This is dated 11 May 1560 from "li Gerbi"—and so was written the very day after the Christian fleet of Philip II of Spain conquered the island of Djerba.

Uzielli and Amat di S. Filippo mention a chart in the Galleria Colonna that was the work of the Ancona cartographer Bartolomeo Bonomi (or Bonomini) and was, it is claimed, used by the admiral of the papal fleet, Marcantonio Colonna, during the Battle of Lepanto.[36] However, this appears to be a family legend, given that this chart of the central Mediterranean is nothing more than a single sheet from a complete nautical atlas;[37] it appears to have been framed in 1897 by a member of the Colonna family eager to commemorate the illustrious feats of his ancestor. The inscription to the chart makes it clear that it was produced in Ancona, but the date is illegible; Uzielli and Amat di S. Filippo's proposal of 1570 was perhaps suggested by a desire to link the chart even more closely with the Battle of Lepanto, yet that date is totally untenable. Nevertheless, the chart, though unlikely to have been used in that glorious undertaking, has probably been in the Colonna family since the sixteenth century. As I have already mentioned, archive material records that in

32. Sotheby's, *Sammlung Ludwig: Eight Highly Important Manuscripts, the Property of the J. Paul Getty Museum, London, Tuesday 6th December 1988 at 11 AM* (London: Sotheby's, 1988), 76–81.

33. Paolo Revelli, ed., *Cristoforo Colombo e la scuola cartografica genovese,* 3 vols. (Genoa: Stabilimenti Italiani Art Grafiche, 1937), 2: 407 and 423.

34. H. P. Kraus (firm), *Fifty Mediaeval and Renaissance Manuscripts* (New York, 1958): 109–11.

35. ItGe2. Giuseppe Piersantelli, *L'atlante di carte marine di Francesco Ghisolfi (Ms. della Biblioteca universitaria di Genova) e la storia della pittura in Genova nel Cinquecento* (Genoa: Edizioni de "L'Assicurazione e la Navigazione," 1947), 8.

36. ItRo19. Uzielli and Amat di S. Filippo, *Mappamondi,* 146 and 296, and Francesco Bonasera, *La cartografia nautica anconetana (secoli XV–XVI)* (Cagli: Ernesto Paleani, 1997), 221–24.

37. This fact would seem to further invalidate the tradition that claims it was used during the Battle of Lepanto. For the organization and command of such an expedition it would undoubtedly have been more useful to have a chart of the whole Mediterranean (including the eastern area). The chart actually comes to an end in the very area where the battle was fought.

1592 Prince Giovanni Andrea Doria's second son, Carlo, commissioned one "sailor's chart" and two "navigating compasses" (probably two portolan charts) from Baldassare Maggiolo.[38]

Several works by the Cretan cartographer Giorgio Sideri, known as Il Callapoda, bear the names and coats of arms of illustrious figures. Examples are the 1561 chart that belonged to "Ant. Calbo Duca C [of Candy]" (ItVe33) and the 1563 atlas owned by "Giovanni Michiel consigliere in Creta" (ItVe11), while Sideri's 1562 atlas is inscribed as "appertaining to the noble Venetian family of the Emo for their passage to Constantinople" (UKL19). And the atlas produced in 1646 by Friar Nicolò Guidalotti of Mondavio is dedicated to the knight Giovanni Soranzo, "knight and bailiff to the Venetian community in Constantinople" (ItVe7).

Such dedications in manuscript works can be safely taken to mean the atlas belonged to—or was actually commissioned by—the dedicatee. This is particularly true when a dedication is to an obscure figure such as "Signor Giovanni Tatti, fiorentino" (in Giovanni Battista Cavallini's "Teatro del Mondo Marittimo"); where the more famous names are concerned, there is a chance that the cartographer was trying to mimic the contemporary trend in printed works. For example, Giovanni Francesco Monno's "Arte della vera navegatione" (a navigational treatise, *portolano,* and nautical atlas) bears a dedication to Onorato II Grimaldi, but it does not appear to have ever actually belonged to that nobleman, while Guglielmo Saetone produced two copies of his "Stella guidante di pilotti e marinari" (a *portolano* and nautical atlas), dedicating both to Ippolito Centurione—even though he presented only one of them to the great Genoese admiral and kept the other for himself.[39]

There are cases in which one can follow the chain of changing ownership. The 1583 atlas by Joan Martines passed from "Charles Howard hig. Admyral of England," to "W.L. Burghly" (William Cecil, Lord Burghley), then to "Charles Bailly gouverneur de la Bay d'udson," and subsequently into the hands of the famous explorer "Pierre Esprit Radisson" before becoming the property of a certain "Morpin" and then returning to Radisson (USCh7). However, with the exception of the first annotation of ownership, all owners are continental and not near the Mediterranean, which is rather puzzling.

The nautical chart that Joan Riczo Oliva drew up in 1588 seems to have become the property of Giovanni Fasoni, functionary of the ducal House of Savoy, in 1594,[40] and one cannot rule out that it may have occasionally served some political-administrative purpose as well as being a source of geographical information. On the other hand, a political-military purpose is clear in the nautical chart of Sardinia drawn up by Joan Oliva in Leghorn (Livorno) in 1629 and in another chart of the island of Elba that may be attributed to the same cartographer; both of them figure among the twenty-eight various maps in a dossier put together for Cardinal Richelieu when plans were being drawn up for an attack on Spanish territories within the Mediterranean.[41]

The first sheet of the five-chart atlas that Joan Oliva drew up in Messina in 1594 bears the inscription "I H S Mar. / D.F. Luperçío de Arbizu / 1594" (USCh9)—and thus appears to have belonged to Luperzio Arbizu, knight of the Order of Malta, who the year before had taken over command of the galley *Capitana*.[42] Given that the date of the inscription of ownership coincides with that in which the work was produced, it seems likely that Arbizu either commissioned this splendid illuminated volume himself or received it as a gift (fig. 7.3).

In effect, there are very few works that can be directly linked to the Knights of Malta. Uzielli and Amat di S. Filippo mention an anonymous four-chart atlas bearing the Cross of Malta on a cardboard binding—possibly dating from the sixteenth century, this work was at the time in a private library (the Sola-Busca-Serbelloni)[43]—and there is a six-chart atlas drawn up in Marseilles by Augustin Roussin that bears an elaborate coat of arms over a Maltese cross on the recto of the first sheet (USB1).

Charts and atlases bearing the cross of the Order of Santo Stefano are more common. For two of these works one can identify the knight who was their owner. On Pietro Cavallini's 1676 atlas one reads "Del Cav I. F. P. Domenico Fabroni di pistoia, 1 Aprile 1676,"[44] and in a 1688 atlas by the same cartographer there is the inscription "This chart belongs to the knight Guglielmo Lanfranchi, Governor of His Highness's fleet of Galleys."[45]

38. Desimoni, "Elenco di carte," 62–63.

39. ItA1 and ItMi5. Gaetano Ferro, "L'Atlante portolanico di Guglielmo Saetone conservato ad Albissola," *Bollettino della Società Geografica Italiana* 94 (1957): 457–77.

40. Stefano Grande, "Attorno ad una nuova carta nautica di Giovanni Riczo Oliva," *Rivista Geografica Italiana* 21 (1914): 481–96. The chart was then in the possession of Carlo Pangella.

41. Tony Campbell, ed., "Chronicle for 1980," *Imago Mundi* 33 (1981): 108–14, esp. 112, and idem, "Chronicle for 1991," *Imago Mundi* 44 (1992): 131–40, esp. 137–38.

42. *Codice Diplomatico del Sacro Militare Ordine Gerosolimitano oggi di Malta . . .*, 2 vols. (Lucca: Salvatore e Giandomenico Marescandoli, 1733–37), 2: 278–79.

43. Uzielli and Amat di S. Filippo, *Mappamondi,* 263.

44. Giuseppe Caraci, "Inedita Cartographica—I. Un gruppo di carte e atlanti conservati a Genova," *Bibliofilia* 38 (1936): 149–82, esp. 166–67.

45. ItPi3. This was "the famous Pisan Knight of Santo Stefano who played a leading role in the naval undertakings of the late seventeenth century." Danilo Barsanti, "Le carte nautiche," in *Piante e disegni dell'Ordine di S. Stefano nell'Archivio di Stato di Pisa,* ed. Danilo Barsanti, F. Luigi Previti, and Milletta Sbrilli (Pisa: ETS Editrice, 1989), 161–66, esp. 166.

FIG. 7.3. BINDING OF A NAUTICAL ATLAS WITH THE COAT OF ARMS OF THE KNIGHTS OF MALTA. 1594 atlas by Joan Oliva, which belonged to Luperzio de Arbizu, Knight of Malta.
Size of the original: 38.8 × 25.5 cm. Photograph courtesy of the Newberry Library, Chicago (Ayer MS. Map 24).

Such decorated works befitted the rank of aristocrats and knights, who may occasionally have taken them on board ship in order to plan military maneuvers or simply to have charts at hand on which they could follow the course plotted by captains and pilots. Nevertheless, we know that similar charts and atlases belonged to sailors of much humbler rank. "Property of ship's master Giovanni Battista Montanaro" is the inscription on an anonymous chart (ItVe44), while another anonymous chart appears to have belonged to "Captain Clemente Corsamino d'arbisola" in 1603,[46] and a plate in another atlas bears the announcement "And this book belongs to Nicolo Canachi of the Island of San Gioana di Pattino, Ship's Pilot" (which is then repeated in Greek).[47] So these two captains and a pilot all owned charts of the Mediterranean that were not intended for direct practical use as instruments of navigation. Of course, this does not rule out the possibility that in their working lives they may have used similar charts—which were eventually destroyed through wear and tear—and kept these more elegant copies as souvenirs of their time at sea.

Similarly, from the end of the sixteenth century onward, the group of landlubbers who possessed manuscript nautical charts and atlases extended beyond sovereigns, princes, aristocrats, and clergy to include much humbler individuals who made various revealing and informative annotations to their new possessions. For example, in an anonymous seventeenth-century atlas the inscription "1661, property of Giasinto Filippi" is followed by another reading "Obtained from the same out of curiosity" (USCh16), and an atlas attributed to Joan Martines contains a curse on those who do not return the book if it becomes misplaced and a promise of a reward (in wine) for those who do: "Blase Voulondet 1586—whoever finds this book will give it back to me, Blase Voulondet, and if they will not return it god will punish them, and if they do return it they will have much wine" (V14).

Thus it is clear that those owners or purchasers of charts who can be identified with certainty are a very diverse group. This seems to prove that the nautical charts of the Mediterranean had lost their main functions as instruments of navigation[48] and appealed to purchasers for a number of secondary reasons. Indeed, these owners do not seem to have been particularly bothered if their charts and atlases were more than fifty years old—and therefore apparently obsolete. For example, a chart case that Crinò argues was made around the middle of the seventeenth century for a Knight of Santo Stefano contained not only a 1636 chart by Placido Caloiro e Oliva (Placidus Caloiro et Oliva) (ItRo9), but also a 1561 chart by Jaume Olives (ItRo5) and 1561 and 1567 charts by Jacopo Maggiolo (Giacomo Maggiolo) (ItRo4 and ItRo6). It may seem strange that the owner of the case kept three charts that were around seventy years old, but one should emphasize that they are actually more accurate than the fourth, and later, chart.[49] The above-mentioned Battista Agnese atlas of around 1552, which had once belonged to Sebastian,

46. ItMi2bis. A further note informs us that the atlas then passed into the possession of Guglielmo Ludovico Porta of Turin, who from 1674 to 1680 traveled the Mediterranean in the service of the Venetian Republic, the Grand Duchy of Tuscany, and the Portuguese crown.

47. UKL2, attributed to Joan Martines.

48. Although not confirmed by verifiable evidence, this can be supposed to have been their principal function based on the names by which these products were identified: *carte da navigar, cartae pro navigando, cartas de marear,* etc.

49. According to Crinò, the client then commissioned a more recent chart—that by Placido Caloiro e Oliva—to make up for the out-of-date toponymic information in the other three. Sebastiano Crinò, "Un astuccio della prima metà del secolo XVII con quattro carte da navigare costruite per la Marina Medicea dell'Ordine di Santo Stefano," *Rivista Marittima* 64, no. 2 (1931): 163–74, esp. 171–72.

Archbishop of Mainz, was in 1637 presented to the eleven-year-old Christina of Sweden by her tutor, who probably held it a fitting work from which a person of her rank might learn geography. And another Agnese atlas, dating from slightly after 1545, was bought in 1643 by Duke August of Wolfenbüttel for the hefty sum of 200 ducats.[50] This interest in precious maps regardless of their age may well explain why Amerigo Vespucci paid 130 (or perhaps 80) gold ducats for a 1439 chart by Gabriel de Valseca.[51]

It is also clear that, unlike world charts, the charts covering the area of the Mediterranean were not subject to important changes and alterations.[52] Hence, a more recent chart of the Mediterranean had no real advantages over one dating from some years earlier; indeed, it was often of poorer quality.

Materials

Like their medieval predecessors, the manuscript nautical charts and atlases of the sixteenth and seventeenth centuries were drawn on parchment, a precious material produced by skilled artisans from the hides of calves, sheep, goats, and maybe even rabbits and pigs, using a long and complex process that had not changed over the centuries.[53]

The two sides of a parchment were very different: the one that had been the outside of the animal's hide was yellowish-brown in color and retained traces of the hair follicles, while the one that had been the inner side of the hide was almost perfectly white and smooth. It was this side that cartographers always chose for the tracing of nautical charts.

A chart might use an entire hide, which was first trimmed of irregular segments. The resulting surface was roughly rectangular in shape, though it tended to narrow toward one side (forming what was known as the neck, the tongue, or the umbilicus). To the rough side was usually fixed a wooden cylinder, decorated with two end pommels, around which the chart might then be wound, fastened in place by a ribbon passing through two small parallel cuts made at the end of the neck. Very few of the charts that have come down to us are wrapped around their original wooden cylinder, and of those extant charts even fewer are today conserved in that form (they can be preserved much better rolled out on a flat surface).[54] To consult the chart, one unrolled it by gripping the narrowed end—or, as Caraci has suggested, one may even have hung the chart on a wall by the neck.[55] However, it is much more likely that, even when not consulted at sea, the nautical chart was always spread out on a flat surface for consultation. As in the case of medieval charts (from the 1330 chart by Angelo Dalorto [Angelino Dulceto] onward), the neck of the charts of the sixteenth and seventeenth centuries usually occupied the left side (if one takes the upper edge to be north).

It is generally held that this protruding side of the chart got its name from the fact that it actually corresponded to the neck of the animal from whose hide the parchment had been made. This may be true of earlier charts, but in the sixteenth and seventeenth centuries this narrow side is not only cut in a curved shape (which recalls the traditional form) but may also be cut as a triangle or a trapezoid. The fact that the neck had become a conventional attribute of parchment charts is even clearer when one looks at those charts made up of two skins joined together along the longest side (for example, the 1561 chart by Jacopo Maggiolo, ItGe9): here the two original necks on the hides have been removed, and the left side of the chart is simply cut into a curved shape. There are even charts in which the neck is actually another bit of parchment stuck onto the main sheet, such as an anonymous seventeenth-century chart (ItVe53).

Compared to medieval nautical charts, those of the sixteenth and seventeenth centuries show greater variety in size (fig. 7.4); the smallest is 40 by 20 centimeters[56] and

50. GeW2. A sheet attached to the work bears the following words: "A book of maps and seacharts surveyed by hand on clean parchment, which given to Malta cost . . . 200 ducats."

51. José María Martínez-Hidalgo, *El Museo Marítimo de la Diputación de Barcelona* ([Spain]: Silex, 1985), 90, and Julio Rey Pastor and Ernesto García Camarero, *La cartografía mallorquina* (Madrid: Departamento de Historia y Filosofía de la Ciencia, "Instituto Luis Vives," Consejo Superior de Investigaciones Científicas, 1960), 73. Compared to this sum, one can only describe as a pittance the 12 ducats Alberto Cantino paid to an unknown Portuguese cartographer for the famous world chart (Cantino wrote: "The said chart made for me in Portugal cost me twelve gold ducats").

52. In the case of world charts, the demand for updated charts may well have led some dishonest vendors to modify the date. This was the case with the Vesconte Maggiolo world chart, which has disappeared without a trace: its original 1527 date was crudely altered to 1587, undoubtedly to give the impression that it was up to date, showing all the latest geographical discoveries.

53. Claudia Consoni, "La pergamena: Procedimenti esecutivi," in *I supporti nelle arti pittoriche: Storia, tecnica, restauro,* 2 vols., ed. Corrado Maltese (Milan: Mursia, 1990), 2:277–95, and Penny Jenkins, "Printing on Parchment or Vellum," *Paper Conservator* 16 (1992): 31–39, esp. 31.

54. Among the few that are still rolled around their original cylinders, one should mention the 1622 chart by Giovanni Francesco Monno (Durazzo-Giustiniani private library in Genoa), the anonymous chart ItBo14, the 1621 chart by Placido Caloiro e Oliva (ItNa5), and another anonymous work in the same library (ItNa15)—all of them rather small in size.

55. Giuseppe Caraci, "La carta nautica del R. Archivio di Stato in Parma," *Aurea Parma* 21 (1937): 183–89.

56. This chart was made in 1622 by Giovanni Francesco Monno (see note 54). Among other small-sized charts one should mention the anonymous seventeenth-century French chart in figure 7.4 (ItBo14), the 1656 chart by Giovanni Battista Cavallini measuring 55 by 19.5 centimeters (UKGr21), another undated work by Cavallini measuring 43 by 20 centimeters (ItRo17), the 1597 chart by Vicente Prunes measuring 54 by 17 centimeters (USNY17), and the 1621 chart by Placido Caloiro e Oliva measuring 50 by 20.5 centimeters (ItNa5).

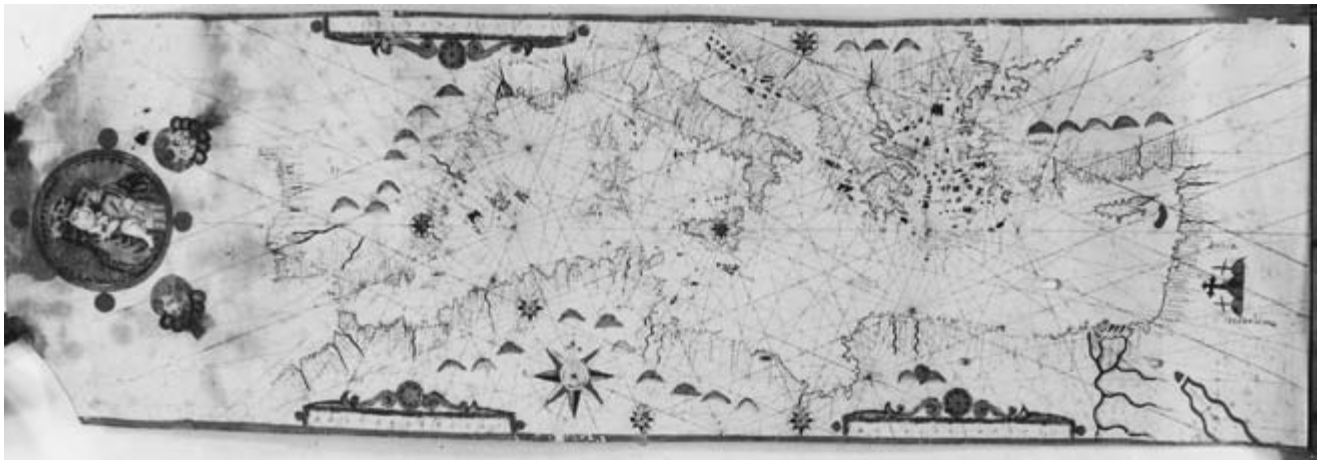

FIG. 7.4. SMALL NAUTICAL CHART. Anonymous seventeenth-century nautical chart of the Mediterranean.
Size of the original: 17.7 × 54 cm. Photograph courtesy of the Biblioteca Universitaria, Bologna (Rot. 81).

the largest 222 by 132 centimeters.[57] Particular mention should be made of the 1644 chart by Alberto de Stefano: measuring 160 by 80 centimeters, this is formed of six individual parchments stuck together on a canvas backing, so it seems to have been originally intended to hang on a wall (UKGr20). This wide variety in size reveals that charts were now losing their original function—given that outsized or undersized charts were obviously of no use to actual navigators.

Rolled-up charts were probably kept in canvas covers or in special containers. Perhaps the only surviving example of a container is that shown in figure 7.5. The interior of this wooden cylinder, faced with elaborately-worked leather, is in fact divided into four smaller cylinders of different lengths and diameters, each designed to hold one nautical chart. Under the lid (another cylinder with a rounded end) there are four different holes, so that each chart can be slid into its respective cylinder.[58] The container must date from around the period of the latest chart, that by Placido e Caloiro e Oliva made in 1636 (ItRo9), and gives us an idea of how such documents were kept and, perhaps, how they were prepared for use on board ship.

FIG. 7.5. CASE FOR NAUTICAL CHARTS. A container, in wood and finely worked leather, intended to hold four nautical charts.
Size of the original: length 84 cm; diameter 12.5 cm. Photograph courtesy of the Biblioteca Nazionale Centrale, Rome (Sez. Cartografia, Varia 5).

However, there were different ways of storing nautical charts. For example, the 1535 chart by Vesconte Maggiolo (ItTo2) is cut into two pieces and glued onto four tablets that are fastened together in accordionlike folds (fig. 7.6); however, we have no way of knowing if this was the way they were originally mounted. There seems little doubt that the odd mounting of the 1630 chart by Giovanni Battista Cavallini was original. Once in the collection of the Counts Guidi of Volterra, this was, according to the description given by Magnaghi, glued onto three wooden tablets that folded on top of one another.[59] However, given that the back of the right tablet bore a chart of the Aegean, this work should more properly be considered an atlas.[60]

Parchment was not always sold by the hide, but was sometimes sold in rectangular-cut sheets. Folded together two or more times, these then formed folios, character-

57. FrP59. It is a 1654 chart signed by Roussin (formed by four joined sheets of parchment) that shows the area of the Mediterranean. Measurements of more than 200 by 100 centimeters are also found in those rare nautical world charts produced in Italy—such as that now called the Pesaro world chart (ItPs2) or the Nicolò de Caverio world chart (FRP2), both dating from the early years of the sixteenth century.

58. Crinò, "Un astuccio," 163–74.

59. Alberto Magnaghi, "Carte nautiche esistenti a Volterra," *Rivista Geografica Italiana* 4 (1897): 34–40.

60. Two 1627 nautical charts by Joan Oliva covering the same area are also mounted in the same way to form a single object. (They are now in private ownership in Portugal.)

FIG. 7.6. NAUTICAL CHART OF THE MEDITERRANEAN GLUED ONTO FOUR PANELS. Vesconte Maggiolo, Genoa, 1535. Size of the original: 2 sheets of 45.9 × 43 cm. Photograph courtesy of the Archivio di Stato, Turin (Corte, Biblioteca Antica, Jb. III 18).

ized by the regular alternation of double white and double yellowish-brown sheets. However, as in the case of nautical charts, folio atlases were always drawn on the white face of the parchment. The sheets could be bound together at the margin (usually on the left side), but it was more usual for them to be folded vertically down the middle, with the yellowish-brown recto of one double sheet glued to the yellowish-brown verso of the next. In this way, all the undesired discolored pages were hidden, and the volume—normally consisting of a limited number of charts—was made more robust and solid.

There are also examples of charts fixed onto backing so that they unfolded in the manner of an accordion: this is the case with the 1555 (UKGr7) and 1556 (ItMa2) atlases by Angelo Freducci (fig. 7.7) and a work in a private collection in Canada, which may be anonymous but is probably the work of Giorgio Sideri and hence datable to around the second half of the sixteenth century.

I should also mention a feature that is particularly noticeable in later works: though bound together along one side, the sheets are not always of the same size (even if they are clearly all the work of the same cartographer). This is the case, for example, with an anonymous French atlas, whose larger sheets are folded over so that they do not stick out of the volume (USCh17).

Naturally enough, the book binding and format were often changed, either to satisfy the tastes of the various owners of the charts or simply for reasons of conservation. Sometimes, however, one can be certain that the extant work is in its original form: this is clear, for example, with a number of atlases by Battista Agnese that have typical sixteenth-century bindings of two hard covers in nut- or red-colored morocco leather decorated with fillet work, arabesques, and six-lobed rosettes in gold—a combination that is, in effect, the trademark of one of the most prolific cartographic workshops of the sixteenth century.[61]

The leather binding of the previously mentioned 1594 atlas by Joan Oliva is also very probably original, given that it bears the coat of arms of the Order of the Knights of Malta (to which we know the first owner belonged)

61. Often a small compass was included inside the back board of the binding. Wagner, however, cautions against using the binding to determine the attribution of an anonymous work. Wagner, "Manuscript Atlases," 6.

FIG. 7.7. NAUTICAL ATLAS WITH ACCORDION-LIKE BINDING. Angelo Freducci, Ancona, 1556.
Size of the original: 35 × 230 cm opened. Photograph courtesy of the Biblioteca Comunale, Mantua (MS. 646).

(USCh9). And the same conclusion can be drawn concerning all those atlases produced in Leghorn that still bear the arms of the Order of the Knights of Santo Stefano on their front cover. Finally, I should mention the splendid mosaic Florence-work in the leather bindings of the three atlases that are attributed to Francesco Ghisolfi and known to have belonged to members of the Medici family and the remarkable turquoise-encrusted binding of the previously mentioned atlas by Battista Agnese.[62]

Manufacture

In both the charts and atlases, part of the drawing might well be in lead pencil. This was the case, for example, with the large circle enclosing the central wind rose and bearing the sixteen peripheral wind roses—as can be seen in the first sheet of the 1512 atlas by Vesconte Maggiolo (where some of the pencil drawing of the circle is still clearly visible) (ItPr2). This procedure is confirmed by the explanation Martín Cortés gives of the drawing-up of a nautical chart: after the drawing of two straight lines that bisect each other at ninety degrees, "over the point where they bisect one must put the center and draw a circle nearly as wide as the whole chart, which is often drawn with lead because it is easy to erase."[63]

In the Braidense Atlas by Joan Martines, four sheets still bear clearly visible marks of the tracing of this large circle (perhaps by a metallic point)—though here the peripheral wind roses the circle was intended to bear are missing. And all the sheets of a Battista Agnese atlas (ItBo11) bear inscribed traces of a large double circle, with the inner circle bearing the wind roses (obviously omitted in the land maps). Therefore, it seems that all the sheets were prepared in the same way, irrespective of their final purpose.

However, the order in which chartmakers carried out all the procedures involved in drawing up a chart is still a matter of debate among scholars. Many claim that coastlines came first, followed by the indications of wind directions, while others claim the exact opposite. The fact that in the 1548 atlas by Vesconte Maggiolo (ItFi20) there are two sheets bearing only wind directions—varying according to the schema used in drawing up the charts—suggests that the wind rhumbs were drawn first. However, these are not unfinished charts but explanatory drawings and therefore do not tell us anything about the actual order in which cartographers worked.

In his chapter "De la composición de la carta de marear," Martín Cortés suggests that first all the wind rhumbs, both main and secondary, be traced in, and then transparent paper and "carbon paper" be used to copy the coastlines from a *padrón* (master copy); he also mentions that one can divide the original into a number of little squares if one needs to enlarge or reduce the image.[64] Bartolomeo Crescenzio mentioned two other methods for copying from an original: the first would have involved stretching both parchments on a frame that was then held against a light source to make tracing possible; the second, known as "pouncing," involved the perforation of the coastline with "thin needles," leaving a trace of pinpricks on the new parchment that could be dusted with soot in order to give a clear black outline to be reworked in pen.[65] The scholar criticizes these two methods as the sources of imprecision and error.

Electron microscope tests of four medieval nautical charts in the BL collection have revealed that in three cases the lines marking wind direction are beneath the others indicating coastlines and place-names—and were therefore obviously drawn first—while in the fourth case it was not possible to identify the lowest level with certainty. However, as Campbell has pointed out, the network of wind lines could not have been used as a framework for the copying—and possible reduction or

62. Corradino Astengo, "La produzione cartografica di Francesco Ghisolfi," *Annali di Ricerche e Studi di Geografia* 49 (1993): 1–15, esp. 6–7, and Wagner, "Manuscript Atlases," 62.

63. Martín Cortés, *Breve compendio de la esfera y del arte de navegar* (Madrid: Editorial Naval, Museo Naval, 1990), 215.

64. Cortés, *Breve compendio,* 214–27.

65. Bartolomeo Crescenzio (Crescentio), *Navtica Mediterranea* (Rome: Bartolomeo Bonfadino, 1602 and 1607).

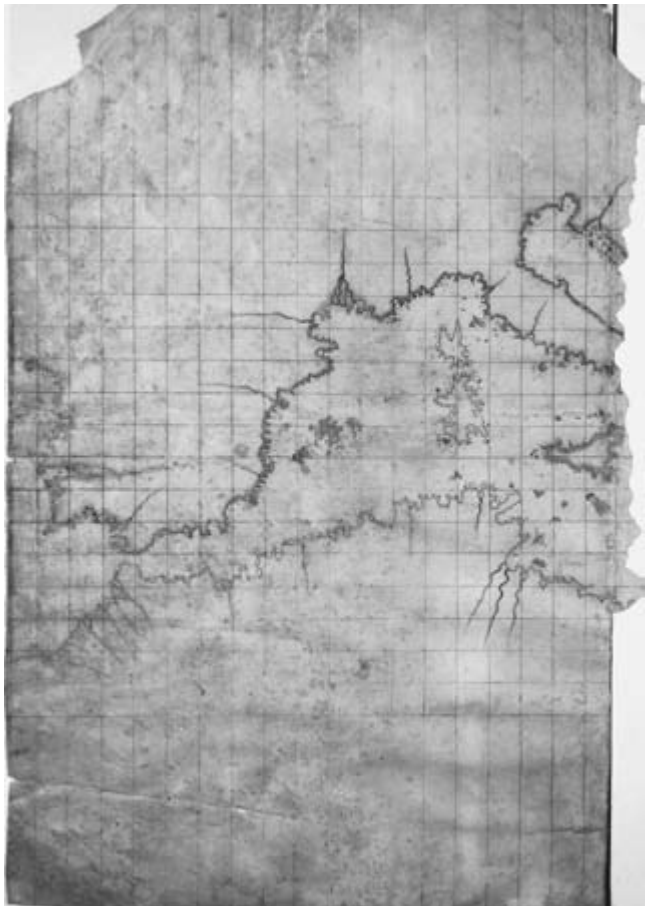

FIG. 7.8. NAUTICAL CHART OF THE EASTERN MEDITERRANEAN WITH GRID. Sheet from a nautical atlas by François Ollive, Marseilles, 1658.
Size of the original: 52 × 34 cm. Photograph courtesy of the Museu Marítim, Barcelona (inv. 10257).

enlargement—of the image, because their position with regard to the coastlines varies from chart to chart.[66]

As to the use of the method of *quadratura* (squaring) suggested by Martín Cortés, the only traces of it are to be found in a few, very late, charts: a half-sheet chart of a 1658 atlas produced by François Ollive (Francesco Oliva) in Marseilles (fig. 7.8) (SpBa8) and two sheets in an anonymous atlas that may be attributed to the same chartmaker (FrMa4). These certainly unfinished works—they show only color-highlighted coastlines, without any place-names or wind directions—are covered by a fine grid of small squares that have nothing to do with geographical meridians or parallels (apparently drawn in lead pencil, they seem to have been intended to be temporary and erasable). The 1658 atlas that Jean François Roussin drew up in Toulon (ItMo4) also contains a chart of the Mediterranean with a fine grid of squares instead of a network of wind rhumbs: however, this chart does have place-names and scrolls bearing the names of the continents (all that is missing is an indication of scale and the usual decorative features). In this case, therefore, it would seem that the grid of small squares was not intended for erasure. Given that these charts cover areas already depicted—at the same scale—by other sheets in the same atlases, their function within the volume as a whole is not clear.[67]

Naturally enough, unfinished charts give us some help in understanding the order in which they were drawn up—though even here, they tell us only about the procedure followed by a particular chartmaker and nothing about generally established rules. As a first example, one might mention an anonymous nautical chart that has been rescued from use as material for book binding (fig. 7.9) (ItSa2). This shows only the eight main winds (in black) without the half- and quarter-winds, together with a traced coastline (also in black), but without any islands (except Euboea) or place-names; there are also circles or series of concentric circles designed to contain the ornamentation for the thirteen compass roses. The chartmaker seems to have worked in the following order: first he drew the lines for the eight winds, then the outlines of land masses, and finally the circles for the ornamental roses (arranged so that they do not overlap the coastline). Afterward he would have gone on to add the other wind lines and the lines of the half-winds, place-names (both black and red), and finally the ornamental figures that this undoubtedly seventeenth-century work would have contained.

A few unfinished nautical charts are bound in one of the three volumes of manuscript charts prepared by Robert Dudley for his *Arcano del mare* and therefore probably belonged to the compiler (GeM3, GeM4, GeM5).[68] One is complete with ornamentation (but uncolored), while another lacks only the red ink place-names. A third chart is very difficult to interpret given that it has a very unusual wind system. It lacks a central wind rose and has four wind roses placed on the hidden circle at the four edges, from which originate only a few wind lines. The Mediterranean area is divided into four separate sections, each differently oriented. Rotating the chart ninety degrees at a time, each section in turn becomes aligned with north; there are no place-names or ornamental features, but the coastline is highlighted in color. Because of its quite odd nature, this chart must be considered some sort of an experiment and cannot be taken

66. Campbell, "Portolan Charts," 390–91.

67. The purpose of the odd chart drawn on the back of the first sheet of Vincenzo Volcio's 1592 atlas (SpM4) is even harder to make out. A "negative" image of the Black Sea has been drawn on this brownish side of the parchment, which normally was not used. The complete wind lines are given (in black, red, and green), the coastline is traced in black, and only the black ink place-names are given (in mirror writing). Black ink is also used to outline a wind rose and for two drawings of sovereigns.

68. Munich, Staatsbibliothek, Cod. icon. 138, 139, and 140.

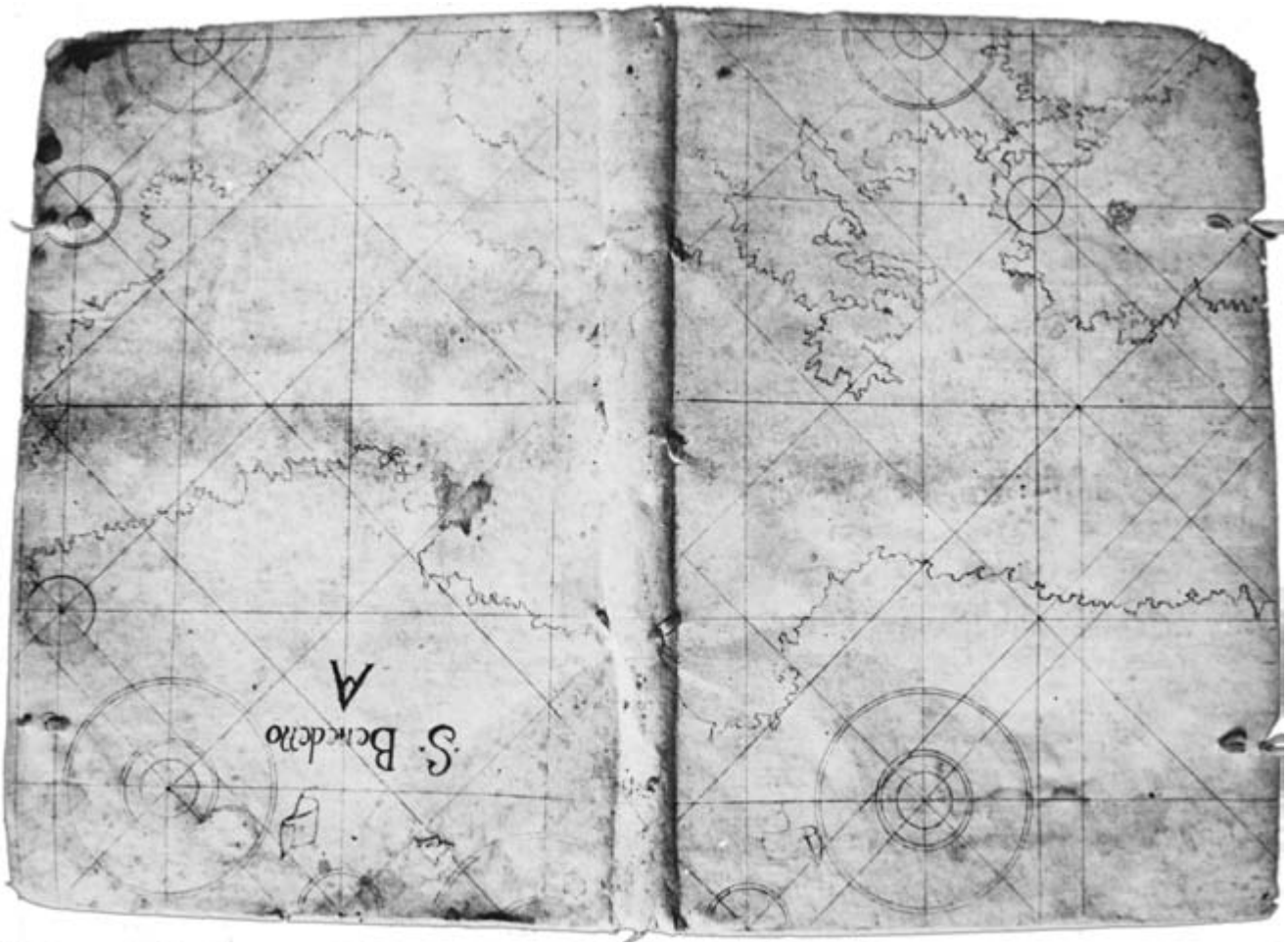

FIG. 7.9. UNFINISHED NAUTICAL CHART ONCE USED FOR BOOK BINDING. Anonymous seventeenth-century nautical chart of the Mediterranean. Size of the original: 38 × 59 cm. Photograph courtesy of the Archivio Vescovile, Savona.

as offering any clue to the normal procedures used by chartmakers.

Another anonymous nautical chart is totally without place-names (ItVe19). As usual, the wind lines are marked in black, green, and red, while the coastline (limited to the east central section of the Mediterranean) is traced in black ink (with greenish-brown underlining). There are also pen outlines for four small compass roses, plus a fifth larger and much more elaborate rose—all of them certainly intended for later decoration in vivid colors.

There is another anonymous chart of the same area, totally without ornamentation and with brown used to emphasize the coastline alone (ItVe15). Only the black ink place-names have been inscribed, while all the red ink names are missing (though the cartographer has left space to add them later).[69]

Another particularly interesting anonymous chart perhaps dates from the beginning of the seventeenth century (ItVe44). Richly decorated with compass roses and miniatures of cities and various animals, the work, however, is totally without place-names. This may well mean that the coastal place-names in red and black were the last things added to a chart—though this one example is hardly enough to establish that this was the general rule. There is also the possibility that this chart—entirely finished in all other respects—had left the cartographer's workshop for the studio of some expert or scholar who was responsible for inscribing the place-names, perhaps in Greek (some-

69. Two other anonymous charts without red ink place-names have come on the market: Lot 51 in the Sotheby's auction of 21 April 1983 and Lot 54 in the Christie's auction of 7 December 1988. The description of the latter points out that, though unfinished, the chart seems to have been used on board a ship. Things are further complicated by an anonymous sixteenth-century Venetian chart (ItVe30), which contains only a few place-names in red ink—except in the areas of the Adriatic, the Peloponnesus, and part of the Archipelago (where the usual black ink place-names are also found). This proves that the cartographer was following his own particular method; however, because the chart belonged to the distinguished Venetian Dandolo family, it could have been a deliberate choice to give detailed information only on those areas where Venice had interests.

thing that was far from uncommon).[70] However, one would seem to be justified in claiming that the coloring of decoration and ornamentation was the last operation carried out before the addition of the cartographer's signature, together with the place and date of completion—though of course not all finished works are signed.[71]

As for atlases, it is more probable that each sheet was completed before being bound in a volume—even if this general rule seems to be contradicted by an anonymous atlas that Wagner, with many reservations, attributes to Battista Agnese.[72] Not only is the traditional scroll intended for the owner's coat of arms incomplete (with the pencil outline only partially inked in); there are also a number of incompletely colored sheets and numerous gridded white sheets that have been left entirely blank.[73] Similarly, doubts are raised by the previously mentioned 1512 atlas by Vesconte Maggiolo (ItPr2), given that the blue used to color the Canary Islands on the fourth sheet has left a clear outline on the opposite page, suggesting that the book was shut before the paint was dry. However, these are only isolated cases from which one cannot generalize.

What does seem clear is that the individual charts in the volumes must have been drawn on rectangles of parchment that had already been cut to size. Atlas charts were therefore very different from those that were divided into sections—such as the previously mentioned Munich chart (GeM5) or an anonymous chart auctioned at Christie's on 21 June 1989, which shows the Mediterranean divided up into six panels (there is absolutely no indication that these were then to be cut up and bound as a volume).[74] As already mentioned, the last phase, for either individual charts or atlas sheets, was in all probability that of coloring and decorating. The brushes used to paint decorative figures, the backgrounds of the smaller islands, and the highlighting of coastlines were made with hairs of vair (squirrel fur) bound together, cut to various shapes, and held in a handle made from a feather (often a vulture feather).

In both charts and atlas sheets, the cartographer used black ink to trace the lines indicating the eight main winds, the coastlines, the outline of ornamental figures, and coastal place-names. This ink was made using ferrous sulfide and finely ground oak nuts dissolved in rain water, vinegar, or wine, with gum Arabic used to thicken the resulting mixture. Red ink was used for the sixteen quarter-winds and the names of the most important coastal locations. It was made using shavings of brazil wood infused in vinegar with gum Arabic, but it might also have been produced using cinnabar or red lead. Green ink, which the cartographer used to mark in the eight half-winds, is not mentioned in medieval or Renaissance treatises; one may assume it was made by diluting verdigris in vinegar and then adding gum Arabic.

The pigments and binding agents used to make the materials that cartographers used to color decoration, create background relief for smaller islands, and highlight coastlines cannot have changed much from the medieval to the Renaissance period. Information on these technical aspects can be gleaned not only from well-known medieval treatises on the matter,[75] but also from two Renaissance works: Giovanni Paolo Lomazzo's *Trattato dell'arte della pittura* (published in Milan in 1584)—a work that "takes up and completes recipes and mixtures from Cennini, Alberti and Leonardo, complementing them with new mixtures"—and Cristoforo Sorte's *Osservazioni sulla pittura* (published in Venice in 1580)—in which, among other things, the author "deals with chorography."[76]

The range of paints available was very wide, but it would take an analysis of a great number of charts to establish which paints were actually used by the various cartographic workshops. One study has focused on Martin Behaim's famous globe, which, as it is drawn on parchment, allows one to suppose that the cartographer—Georg Holzschuher—used the same paints as those used for nautical charts. Analysis shows that the green was produced using verdigris, the red using cinnabar, the white using white lead, the blue using azurite, and the yellow using ochre, with liquid gold and silver plus various organic colorants also used. Hence, no use was made of the more expensive pigments, such as malachite or lapis lazuli, or of coloring agents formed by the mixture of different ingredients.[77]

70. There are three known charts and two atlases that give all place-names in Greek: FrP36, ItL2, USNY1, GrA2, and the Nicolaus Vourdopolos chart that was once in the Archives of the Guidi family in Volterra (Alberto Magnaghi, "L'Atlante manoscritto di Battista Agnese della Biblioteca Reale di Torino," *Rivista Geografica Italiana* 15 [1908]: 65–77 and 135–48).

71. That the inscription was added at the conclusion of the work is shown by the fact that it often includes a date that can refer only to the day on which the chart or atlas was completed. What is more, the long inscription in Jacopo Russo's 1528 chart (UKBi1) is clearly squeezed in between two figures of saints, so it must have been written after they were finished. See Roberto Almagià, "I lavori cartografici di Pietro e Jacopo Russo," *Atti della Accademia Nazionale dei Lincei: Rendiconti Classe di Scienze Morali, Storiche e Filologiche,* 8th ser., 12 (1957): 301–19, esp. pl. X.

72. USCh2. Wagner, "Manuscript Atlases," 102.

73. The anonymous atlas ItBe1 also seems to be unfinished. Gaetano Ferro, "L'Atlante manoscritto della scuola di Battista Agnese conservato a Bergamo," *Rivista Geografica Italiana* 91 (1984): 501–20.

74. Indeed, the drawing in one panel runs over into the next panel. The chart could date from the end of the fifteenth century.

75. See David Woodward, "Medieval *Mappaemundi,*" in *HC* 1: 286–370, esp. 324.

76. Silvia Bordini, *Materia e immagine: Fonti sulle tecniche della pittura* (Rome: Leonardo–De Luca Editori, 1991), 59–60.

77. Bernd Hering, "Zur Herstellungstechnik des Behaim-Globus," in *Focus Behaim Globus,* 2 vols. (Nuremberg: Germanisches Nationalmuseums, 1992), 1:289–300, esp. 298–99.

So, even though we cannot be certain, it seems likely that charts and atlas sheets also made use of low-cost pigments. However, detailed analysis might well bring out regional variations in the use of different pigments and also reveal the use of new substances made available thanks to geographical discoveries and contemporary developments in decorative techniques.[78]

The production of manuscript nautical charts and atlases must have required a great deal of time: for example, the inscription "a Kal Xbris ad Kal Maias 1646" reveals that Friar Nicolò Guidalotti took five months to complete his atlas (ItVe7). However, that is the work of an amateur who probably copied similar works by Placido Caloiro e Oliva,[79] so it does not tell us anything about the output rate of a highly professional cartographic workshop such as that of Battista Agnese (which in the year 1542, we know, turned out completed atlases signed and dated 15 May, [?] June, 28 June, and 25 September).[80]

Workshops, Individual Production, and Anonymous Charts

In discussing medieval cartography, Campbell warns against blanket statements such as "No chartmaker ever worked alone."[81] And two of the previously mentioned works seem to bear out that in the sixteenth and seventeenth centuries there were two possible systems of production: charts might have been turned out either by large workshops (where there was a certain division of labor) or as the occasional products of someone who earned his living in a different field.[82] Only occasionally is the fact that charts or atlases were the fruit of a joint effort made explicit in the actual signature of the work (for example, in the 1525 chart cosigned by Vesconte Maggiolo and Giovanni Antonio Maggiolo, ItPr3). However, even here, given that four years later Vesconte would apply to the Senate for his sons Giovanni Antonio and Jacopo to be formally recognized as his fellow cartographers, the double signature may have had an ulterior motive: to demonstrate that the young man was a fully fledged assistant rather than a mere apprentice.

Similar problems are raised by the Leghorn-produced atlases signed jointly by Joan Oliva and Giovanni Battista Cavallini and by Giovanni Battista and Pietro Cavallini (in 1636 [USCh13] and 1654 [ItPr8], respectively). Given that in both cases the works date from approximately the early career of the younger of the two cartographers concerned, it seems more likely that the double signatures are less the recognition of collaboration between teacher and pupil than the official presentation of the successor designate—and therefore it cannot be ruled out that the atlases in question were really the work of the older of the two. The situation is rather different when one looks at the 1592 chart produced in Majorca and signed by Reinaut Barthollomiu de Ferrieros and Matteo Prunes (ItFi9). Caraci ruled out that Ferrieros may have simply been the chart's owner and suggests that he may well have been Prunes's assistant—in which case the double signature served to make the chart appear more authoritative in the eyes of a potential purchaser.[83]

There are also atlases that are not the result of direct collaboration but merely consist of sheets produced by different chartmakers and then bound together. Examples of these are the atlas consisting of charts by Joan Riczo Oliva and Baldassare Maggiolo (SpM8 and SpM9), one with charts by António Sanches and Giovanni Battista Cavallini (NG4), and another with charts by François Ollive and Augustin Roussin (ItTr3 and ItTr4). In these cases, each chartmaker worked independently without ever moving from his own workshop, and the fully finished charts were bound together at a later date (perhaps at a much later date).

That a distinction was made between the work of a chartmaker and that of a copyist is clear from the inscription on a chart by Jacopo Russo: "Iacobus russus messanensis me fecit in nobili civitate Messane anno DNI 1563 per ioanes Antonio Talamo composta amen,"[84] which clearly differentiates between the intellectual task

78. Catherine Hofmann, "'Paincture & Imaige de la Terre': L'enluminure de cartes aux Pays-Bas," in *Couleurs de la terre: Des mappemondes médiévales aux images satellitales,* ed. Monique Pelletier (Paris: Seuil / Bibliothèque Nationale de France, 1998), 68–85.

79. Handwritten note by Marcel Destombes.

80. These are USNY33, GeKa1, V6, and UKG1, respectively. Wagner dates another four atlases without inscriptions (or with partially illegible inscriptions) as produced in the year 1542. Wagner, "Manuscript Atlases," 64–69.

81. Campbell, "Portolan Charts," 429.

82. Caraci claims that cartographers such as Joan Oliva and Vincenzo Volcio—who seem to have been constantly on the move from one Mediterranean port to another—could have been sailors who worked as mapmakers during their long stop-overs in port (Giuseppe Caraci, "Gio. Batta e Pietro Cavallini e una pretesa scuola cartografica livornese," *Bollettino Storico Livornese,* anno. 3, no. 4 [1939]: 380–88, esp. 385). However, the very opposite seems to be true—particularly for the likes of Oliva, whose work was so extensive and full it can have been produced only by a professional, and whose peregrinations from city to city ended with his settling permanently in Leghorn. So it seems possible that a professional cartographer like Joan Oliva may have spent, for reasons unknown to us, some years of his life on board ship as a sailor or pilot. Obviously one can speak of "part-time" cartographers when the author of a map himself gives his profession as other than cartography (this is the case, for example, with "ship's captain" Guglielmo Saetone or "surgeon" Giovanni Francesco Monno).

83. Giuseppe Caraci, "A proposito di alcune carte nautiche della Biblioteca Nazionale di Parigi," *Estudis Universitaris Catalans* 14 (1929): 259–78, esp. 272–73.

84. Osvaldo Baldacci, *Documenti geocartografici nelle Biblioteche e negli Archivi privati e pubblici della Toscana,* vol. 3, *Introduzione allo studio delle geocarte nautiche di tipo medievale e la raccolta della Biblioteca Comunale di Siena* (Florence: Leo S. Olschki, 1990), 71 n. 1, and Almagià, "I lavori cartografici," 306.

of cartography (*fecit*) and the manual one (*composta*). In this case, the hand that actually drew the chart belonged not to a member of the cartographer's family or to an apprentice destined to become a cartographer in his own right, but to a simple copyist, who limited himself to reproducing a given model.[85]

Scholars have recognized that at least within the more important workshops there was a further division of labor. Baldacci refers to the presence of amanuenses and draftsmen, but admits that our insufficient knowledge of the way such workshops were organized prevents us from going any further.[86] Campbell points out that a medieval illuminated manuscript was normally the work of a scribe, a rubricator, and at least one painter.[87] Almagià seemed to confirm the extension of this practice to cartography when in his examination of an anonymous chart (V15bis) he found that the scribe had omitted the initial letter from the legends—presumably leaving the space to be filled in by a rubricist or a miniaturist—and that the actual initials were a crude addition by a later hand trying to complete the unfinished text.[88] The same conclusion might be reached in studying the previously mentioned chart that lacks all the red ink place-names (ItVe15); however, another explanation for their absence might be that the amanuensis or cartographer who completed the place-names in black fully intended to go on to those in red, but for some reason or another never did.

The work of an inexperienced worker would seem to be the best explanation for the incomplete erasure of the lead pencil circle in the plate of Vesconte Maggiolo's 1512 atlas or the heavy tracing of the double circles in the sheet of the Battista Agnese atlas (ItBo11). Rosselló Verger argues that the lines of the wind rhumbs must have been drawn by apprentices.[89] However, this claim is acceptable only if one holds that the wind lines were always drawn in before the coastlines; otherwise there was the risk that some inexperienced trainee would ruin the just-completed work of a master cartographer.

The presence of apprentices and specialized assistants such as draftsmen, amanuenses, and miniaturists in the larger cartographic workshops perhaps throws some light on the relation between signed and unsigned works, and helps to explain why so many of the extant charts and atlases are anonymous. On the basis of the material listed by Uzielli and Andrews, Caraci calculates that some 36 to 38 percent of all charts produced over the period from the thirteenth to the seventeenth century must have been anonymous.[90] Recently Baldacci raised the figure to as high as 60 percent.[91] However, Caraci's estimate seems more realistic, especially when one considers that a survey of the extant material from the sixteenth and seventeenth centuries puts anonymous works at around 40 percent of the total.[92] Nevertheless, even Caraci's figure is too high for the absence of signatures to be explained by mere forgetfulness or chance. In many cases, it must have been intentional and dictated by reasons that may not be immediately obvious.

In a workshop, only the master cartographer or master cosmographer was in a position to sign a chart or atlas and thus underwrite its authenticity and reliability; however, it is possible that apprentices and assistants produced further copies that—precisely because they were unsigned—sold at a lower price. Probably such copying took place when, in the absence of commissioned works, the alternative was to leave the workshop staff idle. Nor can one rule out that, once they had finished their apprenticeship, trainees drew up charts on the basis of workshop models and then sold them off—unsigned and undated—to buyers attracted by their bargain price.[93] So in effect the anonymous works are authorized or unauthorized copies of the works drawn up in the main cartographic workshops.[94]

Of course, one cannot help wondering why so accomplished a cartographer as Ghisolfi never signed any of the ten atlases that are now attributed to him. And, while it is true that his works bear a certain resemblance to those of Agnese—so much so that Revelli did not hesitate to declare him Agnese's pupil—it is hardly likely that the Doria or Medici families would have bought pirate or second-rate copies simply in order to save money.[95] All in all, there is simply no convincing explanation for Ghisolfi's choice of anonymity.

85. In the well-known Pizigani chart of 1367 the meanings of the two terms seem to be opposite: *compoxuit* refers to the plotting and planning of the chart, while *fecit* indicates the actual work of drawing it. Giuseppe Caraci, "A conferma del già detto: Ancora sulla paternità delle carte nautiche anonime," *Memorie Geografiche* 6 (1960): 129–40, esp. 138–39.

86. Baldacci, *Introduzione allo studio,* 71–72.

87. Campbell, "Portolan Charts," 429.

88. Almagià, *Monumenta cartographica Vaticana,* 1:33, 34–35 n. 6. It should be added that the chart Almagià dates as a fifteenth-century product of the Fra Mauro workshop, Caraci argues is a sixteenth-century work by one of the Freducci family of cartographers—in which case it would fall within the area covered by this study. Giuseppe Caraci, "The Italian Cartographers of the Benincasa and Freducci Families and the So-Called Borgiana Map of the Vatican Library," *Imago Mundi* 10 (1953): 23–49.

89. Vicenç M. Rosselló Verger, "Cartes i atles portolans de los col·leccions espanyoles," in *Portolans procedents de col·lecions espanyoles, segles XV-XVII: Catàleg de l'exposició organitzada amb motiu de la 17a Conferència Cartogràfica Internacional i de la 10a Assemblea General de l'Associació Cartogràfica Internacional (ICA/ACI), Barcelona, 1995* (Barcelona: Institut Cartogràfic de Catalunya, 1995), 9–59, esp. 47. (Rosselló Verger's article also appears in Spanish, French, and English).

90. Giuseppe Caraci, "Di alcune carte nautiche anonime che si vorrebbe attribuire a Girolamo da Verazzano," *L'Universo* 39, no. 3 (1959): 307–18 and no. 4 (1959): 437–48, esp. 437.

91. Baldacci, *Introduzione allo studio,* 71.

92. Astengo, *Elenco preliminare.*

93. Caraci, "Di alcune carte nautiche anonime," 439.

94. Baldacci, *Introduzione allo studio,* 71.

95. Revelli, *Cristoforo Colombo,* 2:407.

Comparison of individual workshops also reveals idiosyncratic differences: though only 30 percent of the works now considered to have come from the Agnese workshop are actually signed, the figure rises to more than 90 percent for the charts and atlases attributed to the Genoa workshop of the Maggiolo family. It is possible that this difference is due to the fact that the former was an entirely private workshop, while the latter was approved and privileged—that is, in part subject to state control—and therefore may have had a different way of working.

Collaboration in both large and small workshops may well explain the extremely long working life of such cartographers as Battista Agnese, Jacopo Russo, and Jacopo Maggiolo. Perhaps the master's pupils went on using his signature after his death[96] or else the aged master simply limited himself to signing works turned out by his workshop.[97]

Finally, there is the question of whether the actual navigation charts were signed or not. Given that these were low-cost copies, one might be inclined to say no; however, since these charts were used on board ship, the guarantee provided by the cartographer's signature would seem to have been indispensable.[98]

A large workshop might draw on the services of a number of amanuenses—and even nonprofessional cartographers may have employed an amanuensis who also worked for others—so it is clear that handwriting offers no conclusive proof in identifying the author of a particular anonymous work. Hence, one can no longer accept the claim of Destombes that while all other features—and the drawing of coastlines, in particular—changed over time, handwriting remained immutable and therefore serves to identify the author of anonymous charts.[99] Here one has to agree with Caraci, who, after showing that the same handwriting might be associated with different cartographers (or that two distinct handwritings might be associated with the same cartographer), argued that script was only one of a number of features, such as coastal outline, structure, place-names, and decorative details, that the scholar must take into consideration if he wants his identification of a chart's author to carry any real weight.[100]

Technical Features: Rhumbs, Wind Roses, Scale

The systems of wind rhumbs used in the nautical charts of the sixteenth and seventeenth centuries differ very little from those found in the charts of the late Middle Ages: around a central rose, generally showing thirty winds, sixteen peripheral wind roses (in which the number of winds might vary) lay along the circumference of a "hidden circle."[101] Often, because of the elongated form of the chart, another wind rose might be added to the left or right of that circle. In one case, Alvise Gramolin's 1624 chart of the Adriatic (ItVe47), the chart is so long and thin that the system of rhumbs is actually halved: half a wind rose is shown on one side of the chart, and nine peripheral roses form a large semicircle around it. As in earlier centuries, a wider variety of schema can be found within atlases. For example, there are sheets in which there is only a central wind rose and no peripheral roses (Alberto de Stefano's 1645 atlas, UKL45) or in which the rhumbs are drawn only in the space within this hidden circle (Vesconte Maggiolo's 1548 atlas).[102]

96. Almagià, "I lavori cartografici," 313. The suggestion that the inscription was sometimes added by an assistant rather than by the master cartographer himself is borne out by those cases in which the latter's name is actually spelled incorrectly. For example, one atlas (ItVe13) is signed *Baptista Palnese* instead of Battista Agnese, and a chart (FrMa1) bears the name *Joan Oliva alias Arizon* instead of Joan Oliva alias Riczo. It is hardly likely that such errors were made by someone writing his own name.

97. Giuseppe Caraci, "Le carte nautiche del R. Istituto di Belle Arti in Firenze," *Rivista Geografica Italiana* 37 (1930): 31–53, esp. 39.

98. The real—undecorated—navigation charts destined for use on board ship have, obviously enough, not survived. However, the 1567 chart by Jacopo Maggiolo does seem to have the characteristics of such working charts: it shows a limited area—the Sea of Liguria and the northern Tyrrhenian—on a large scale without any ornamentation, if one excludes the miniature of Pisa (which may have been added later and is certainly by a different hand). The chart is inscribed and signed, but given that it is the product of the official *magister cartarum pro navigando* (master of charts for sailing), whose workshop was approved and privileged by the Republic of Genoa, the fact does not seem to be conclusive proof.

99. Marcel Destombes, "Nautical Charts Attributed to Verrazzano (1525–1528)," *Imago Mundi* 11 (1954): 57–66, esp. 59–60.

100. "Those with some experience of old nautical charts know very well that the distinctive characteristics of a cartographer or a school of cartographers generally include such features as drawing (the way the coastlines are drawn and colored), frame of reference (lines of direction, wind roses, parallels, Tropics and/or Equator, or the 'raya' etc.), and scale—as well as the decorative or verbal elements included either inside or outside the drawing (the former elements including such things as flags, standards, city views, figures of sovereigns, landscapes, animals, and legends, etc.; the latter including inscriptions, figures of the Madonna or saints, explanations of scale, drawings of ships, marine monsters, and so on). In signed maps of certain attribution, these features usually occur with monotonous repetitivity, and though they might change a little they never disappear altogether. It is as if they are an ingrained part of the personality or experience of a particular cartographer, or one of the habitual characteristics of a certain school." Caraci, "Di alcune carte nautiche anonime," 313.

101. In the charts of Matteo Prunes and in the Vesconte Maggiolo world map (ItFa1), Baldacci identifies a whole series of innovations in the gridwork, describing them as "inexplicable attempts at geometrical symmetry." However, looking more closely one sees these are really only apparent innovations: what looks like a new grid is actually the result of the fact that the green-brown lines indicating the half-winds stand out more than the black lines tracing the courses of the main winds (partly because they are drawn in more thickly, partly because they have faded less). Baldacci, *Introduzione allo studio,* 38.

102. In all the sheets of this atlas (ItFi20) covering Europe and the Mediterranean, both the network of rhumbs and the geographical outlines are contained within the hidden circle, while the sheets depicting the oceans follow the normal practice—with rhumbs and geographical outlines extending right to the edge of the sheet.

It has often been said that the compass roses were not just decorative details designed to fill in empty spaces but rather an essential component of any nautical chart—given that their reproduction of the points of the compass made coordinated use of chart and compass possible.[103] In effect, however, the color-coded lines of the wind roses already formed the cognitive framework necessary for the alignment of the chart and actual plotting of a ship's course. This is borne out by the fact that the first known complete compass rose occurs in the 1375 Catalan Atlas—that is, almost a century after the birth of nautical chartmaking—and thereafter a number of charts continued to do without one. What is more, it seems likely that the charts actually used on board ship never contained compass roses.[104] So their appearance seems to be directly linked to the growing taste for cabinet nautical charts, which had either a didactic purpose or no nautical purpose at all. This would also explain their great variety in size and form and the lack of any clear color coding. However, given that compass roses did apparently have some role in explaining the use or structure of nautical charts, I prefer to deal with them here rather than along with what were obviously decorative features and no more.

Winter claims that the design of compass roses is one of the most important clues to identifying the workshop and date of many anonymous charts,[105] but Rosselló Verger doubts this, observing that "it would seem that every author, at every opportunity and on every single page, is trying to demonstrate that the combinations of circles, points, rules, letters, fleurs-de-lis, and colours . . . are simply infinite."[106] Campbell, for his part, accepts that compass roses are important in establishing the date and place of production of nautical charts, but points out that Winter's research is flawed because it is based largely on undated charts (which are clearly of little use in dating others).[107] In effect, what is needed is an exhaustive catalog of compass roses, given that the table accompanying Winter's study reproduces only twenty-two—and only four of those come from the period under examination here: those of Pilestrina 1511, Maggiolo 1512, Freducci 1556, and an anonymous work now in Dijon that is considered Portuguese. What is more, of the two types of compass roses normally used by the Maggiolos, Winter gives the less significant, the one which is more similar to other contemporary designs.[108]

In another work Winter suggests a division between Italian and Catalan compass roses on the basis of the symbol used to indicate north—a blunted triangle or wedge in the former, a lily (often emerging outside the rose) in the latter.[109] The Catalan symbol is said to be of Portuguese origin, while the Italian wedge (drawn within the circumference of the rose itself) is said to derive directly from the face of the nautical compass. However, one can find both symbols for north in the works of a single cartographic workshop: the Maggiolo family of cartographers (from Genoa) used the lily in small compass roses and the wedge in large, while the Catalan cartographer Joan Martines seems to have followed the opposite rule. Similarly, the same initials are used to identify the six main winds—Greco, Scirocco, Ostro, Libeccio, Ponente, and Maestro (northeast, southeast, south, southwest, west, and northwest)—and a cross is used to indicate east, probably a reference to the location of Jerusalem, or even the site of the Garden of Eden.[110]

So without a full catalog one cannot establish general rules, nor can the intricacy or sobriety of design be used to distinguish between the Catalan and Italian compass roses of the sixteenth and seventeenth centuries.[111] However, there are some broad chronological guidelines: seventeenth-century roses are generally more numerous, larger, more gaudily colored, and less accurately drawn than earlier ones. From the end of the sixteenth century onward, north was indicated almost exclusively by the symbol of the lily, which got larger and larger until it began to look like some sort of multicolored plume.[112]

103. "In order to find our way successfully, it is not enough just to have a map. We need a cognitive schema, as well as practical mastery of way-finding, to be able to generate an indexical image of the territory." David Turnbull, *Maps Are Territories, Science Is an Atlas: A Portfolio of Exhibits* (Geelong, Australia: Deakin University Press, 1989), 51.

104. Rey Pastor and García Camarero claim that with time this scientific tool became a purely decorative feature; its total lack of function is proved by the increase in size and number of the wind roses given. Rey Pastor and García Camarero, *La cartografía mallorquina,* 14.

105. Heinrich Winter, "A Late Portolan Chart at Madrid and Late Portolan Charts in General," *Imago Mundi* 7 (1950): 37–46, esp. 37–40.

106. Rosselló Verger, "Cartes i atles portolans," 47.

107. Campbell, "Portolan Charts," 395.

108. Vesconte, Jacopo, Giovanni Antonio, and Baldassare Maggiolo use two different wind roses: a small eight-point rose and a larger white disk framed by a narrow ring on which a total of thirty-two points are marked (eight of them identified by the initials or symbols of the eight main winds).

109. Heinrich Winter, "On the Real and Pseudo-Pilestrina Maps and Other Early Portuguese Maps in Munich," *Imago Mundi* 4 (1947): 25–27, esp. 25–26.

110. Giovanni Marinelli, review of *La carta nautica di Conte Ottomanno Freducci d'Ancona conservata nel R. Archivio di Stato in Firenze,* by Eugenio Casanova, *Rivista Geografica Italiana* 2 (1895): 126–28, esp. 128.

111. While the wind roses in Battista Agnese's work are characterized by a certain sobriety, those in the charts and atlases drawn up by another foreign cartographer at work in Venice—Giorgio Sideri, known as Il Callapoda—are noteworthy for their complicated system of concentric rings and the great taste shown in the combination of colors. The roses in many of Joan Martines's atlases, on the other hand, are generally small, with a single external ring and the initials of the winds inscribed in the inner disk.

112. Think, for example, of the work produced in Marseilles by François Ollive toward the end of his career.

Unlike compass roses, scales are always given on the charts in a rigidly codified form: invariably there was an alternating sequence of white and dotted spaces (each corresponding to fifty miles), with the dotted spaces internally divided into five short bars (each corresponding to ten miles).[113] At most there might be a slight variation in the symbol used to highlight the alternation between the larger spaces (sometimes it is a dot within a circle, sometimes a semicircle accompanied by two vertical lines). The differences in style that have been highlighted by scholars involve not the scale itself but the ornamental work containing it, which might be a simple frame, an unfurling banderole, or a complicated composition decorated with floral motifs.[114] Generally, the scale is given along the top or bottom of the chart, though in some rare cases it might be along the right or left margin. In atlases, it is sometimes placed, without any containing scrollwork, diagonally at one or more corners of the chart (as in works by Battista Agnese) or else between two series of parallel segments (as in Freducci's charts).

Caraci has pointed out that in some of Domenico Vigliarolo's charts the scale is laid out so the four components form the letter "M" (fig. 7.10)—a feature that, along with other significant details, made it possible for him to identify the anonymous Borgiano VI chart (V16) as the work of the Calabrian cartographer.[115] As in the case of medieval charts, those of the period under discussion do not give any indication of the unit of measure actually used in the scales. An exception is the previously mentioned chart auctioned at Christie's on 21 June 1989: this shows the Mediterranean in six different panels, each one of which is to a different scale based on a local "mile," and this variation seems to be the main reason for the unusual form of the chart.[116]

Another exception seems to be the manuscript nautical charts drawn up in Genoa by Francesco Maria Levanto in the years 1661–62 and bound as a single volume sometime in the following century: the scales use Italian miles, Dutch leagues, and English leagues.[117] However, given that these works were derived from Dutch nautical charts, and the work of Anthonie Jacobsz. in particular, they cannot really be classified as belonging to the tradition of Mediterranean cartography.

As to the actual ratios of reduction used, there do not seem to have been many changes since the Middle Ages. Frabetti's study, which covers ten portolan charts of the sixteenth and seventeenth centuries, shows that the ratio can vary from 1:5,500,000 to 1:8,500,000.[118] However, from atlas to atlas—or even between the sheets of a single atlas—there were much more striking variations in scale. Rosselló Verger's examination of the atlases in Spanish libraries and museums revealed that for the western Mediterranean the most usual scale was 1:7,000,000, though there were wide variations.[119]

During the course of the sixteenth century, a scale of latitude began to make its appearance in nautical charts produced in the Mediterranean area. This innovation, derived from Spanish work, is perhaps to be seen for the first time in two charts of the Atlantic: that by Conte di Ottomanno Freducci (dated around 1514–15) (ItFi7), which shows latitude from 60°N to 15°S, and the 1516 chart by Vesconte Maggiolo (USSM1). From this time onward, a scale of latitude became an essential feature of all nautical world charts and oceanic charts, such as those in Battista Agnese's atlases (which often also contain indications of longitude). By the second half of the century, latitude was also being given in nautical charts of the Mediterranean. The scale, which generally extended from 10–15°N to 50–60°N, was given in the Atlantic just off the coast of Europe or Africa and generally puts Gibraltar at between 35° and 36°N. However, even later in the century, those charts that do not extend beyond Gibraltar contain no indication of latitude, which shows that such a scale was applied only to the oceans and not to the

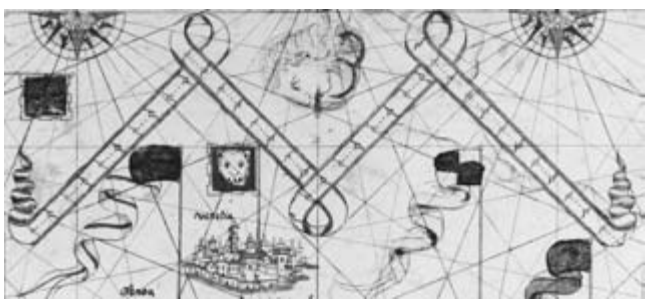

FIG. 7.10. INDICATIONS OF SCALE ARRANGED TO FORM THE LETTER "M." Detail of a nautical chart of Italy by Domenico Vigliarolo, Palermo, 1577. (See also fig. 7.23.) Size of the detail: ca. 11.1 × 23.8 cm. Photograph courtesy of the Map Collection, Yale University Library, New Haven (*49 1577).

113. As one would expect, scale bars are usually not given in the nautical or terrestrial world charts included in nautical atlases. However, in the three charts of the oceans that normally feature in Battista Agnese's atlases, which together form a sort of nautical world chart, there is a scale bar placed diagonally across one corner: it consists of a series of closely spaced dots and the legend "one hundred miles from dot to dot."

114. Rosselló Verger, "Cartes i atles portolans," 46–47.

115. Giuseppe Caraci, "Le carte nautiche anonime conservate nelle biblioteche e negli archivi di Roma," *Memorie Geografiche* 6 (1960): 155–245, esp. 167–93.

116. Tony Campbell, ed., "Chronicle for 1989," *Imago Mundi* 42 (1990): 120–32, esp. 128.

117. Durazzo-Giustiniani private library, Genoa.

118. Pietro Frabetti, *Carte nautiche italiane dal XIV al XVII secolo conservate in Emilia-Romagna: Archivi e Biblioteche Pubbliche* (Florence: Leo S. Olschki, 1978). Obviously this is not the case with regional nautical charts, such as that of the Aegean produced in 1601 by Vincenzo Volcio (ItBo4), in which Frabetti calculates the scale to be 1:1,500,000.

119. Rosselló Verger, "Cartes i atles portolans," 47.

Mediterranean Sea (further proof of the different techniques of navigation in these two different worlds, and that those who applied them were well aware of the difference). Hence, one might say that the scale of latitude formed a sort of link between the enclosed sea and the open ocean, a bridge linking the old ports of the Mediterranean and the rest of the world.

Often—as in Jacopo Russo's 1563 chart—the scale of latitude is given divided into two or three parts, probably to facilitate its insertion in the chart as a whole; in fact, in the Russo chart the central section of the scale of latitude, from 34° to 48°N, is shifted to the right so as not to overlap the large wind rose (SpV1).

The Nordenskiöld Collection contains a 1568 chart by Domingo Olives in which the scale of latitude is interrupted at 29°N, and the lower section, from 14° to 29°N, is rotated approximately five degrees counterclockwise with respect to the upper section, running from 29° to 62°N. According to Winter, this is a very early attempt to correct the usual rotation of the axis of the Mediterranean.[120]

The Axis of the Mediterranean

As is well known, in medieval charts the Mediterranean is depicted with its axis rotated eight to ten degrees counterclockwise. Scholars have generally attributed this shift to magnetic declination, or rather to the desire to make north as indicated on a chart coincide with north as indicated by a compass needle.[121] However, it has also been argued that the rotation is due to the difference in length between the two parallels supposedly used as the bases for a trilateral grid,[122] or simply to the cartographer's desire to include within the rectangular parchment countries such as Flanders and England, which would otherwise be excluded.[123]

Whatever the reason, the shift in the east-west axis of the Mediterranean remained practically unchanged throughout the Middle Ages, with the rotation varying between seven degrees and eleven degrees, fifteen minutes (that is, up to an entire rhumb). And in spite of the great advances in nautical knowledge made during the age of the great geographical discoveries, no correction was made to the discrepancy—as can be seen, for example, from the first large manuscript world charts, which, although extended to include all recently discovered lands, still show the Mediterranean with the usual medieval inclination.

However, the aberration in the axis of the sea does seem to have been corrected in a large anonymous world chart produced by the Casa de la Contratación and donated to Cardinal Giovanni Salviati. Dating perhaps from the years 1526–27, this work shows Gibraltar aligned with Crete and Cyprus for the first time. The same alignment can also be seen in the large anonymous world chart known as the Castiglioni world chart and the world maps produced in Seville by Diogo Ribeiro in 1527 and 1529.[124]

Nevertheless, such changes seem to have gone unnoticed by the cartographic workshops of the Mediterranean, which went on depicting the sea in the traditional way. Even a cartographer like Vesconte Maggiolo, who was very attentive to contemporary advances in geo-

120. Winter, "Late Portolan Chart," 44–45. In fact, it is in no way certain that this scale of latitude divided into two different segments with different inclinations was intended to correct the error in the orientation of the Mediterranean. That aim could have been achieved more effectively with two differently oriented scales placed in the Atlantic and the eastern Mediterranean, respectively. It is therefore fairly probable that this original scale of latitudes was intended to indicate a magnetic variation in the Atlantic.

121. A note on magnetic declination is to be found in a margin of the Leiden Universiteitsbibliotheek codex of Maricourt's "Epistula de magnete," which dates from the first half of the sixteenth century: "Note that we must deviate the southern needle one point to the west in proper use [*usus directorii*]. And this must be on account of a deviation of the southern part to the east, since the southern part of the instrument lacks divisions [markings]. Note that the magnetic stone or even the needle rubbed with the same stone does not directly point to the poles, but we believe that the part that points to the south deviates somewhat to the west, and we believe that the part that points to the north to the same extent, deviates to the east." Pierre de Maricourt (Petrus Peregrinus de Maricourt), *Opera: Epistula de magnete, Nova compositio astrolabii particularis,* ed. Loris Sturlese and Ron B. Thomson (Pisa: Scuola Normale Superiore, 1995), 53.

122. James E. Kelley, "Perspectives on the Origins and Uses of the Portolan Charts," *Cartographica* 32, no. 3 (1995): 1–16, and Jonathan T. Lanman, *On the Origin of Portolan Charts* (Chicago: Newberry Library, 1987), 23.

123. David Woodward, personal communication, October 1992.

124. See figures 30.25, 30.28, 30.29, and 30.30. In the legend, the famous *cosmógrafo real* explains the reasons for this modification and shows that he is fully aware of the difficulties caused for the cartographer by the move from compass-based navigation to astronomical navigation, which necessarily meant introducing meridians and parallels oriented to true north into wind rhumb maps and charts based on magnetic north (see Randles, "La carte-portulan méditerranéenne"). His correction, therefore, is limited solely to the axis of the Mediterranean in order to avoid excessive alterations to an already familiar picture.

To explain what he had done, Ribeiro wrote: "Note that the *Levante,* which we usually call what is contained inside the Strait of Gibraltar, is situated and laid down by its height [i.e. latitude], according to people who have been in some of its parts and taken (the height of) the Sun; and in the rest I follow the cosmographers who have specially spoken of the latitude of some places; and the degrees of longitude in it cannot correspond to the parts which they measured in the equinoctial, by reason that the parallels are smaller, because in reality from Cairo to the Red Sea or from Damascus or Jerusalem to the Persian Sea there is very little distance, and it is made great here on account of the smallness of the parallels, as I have said; I have therefore considered this a lesser inconvenience than not to disproportion the sea and land of the *Levante* against what is already established and conceived in the mind." Quoted in 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 da Moeda, 1987), 1:93 (brackets in original).

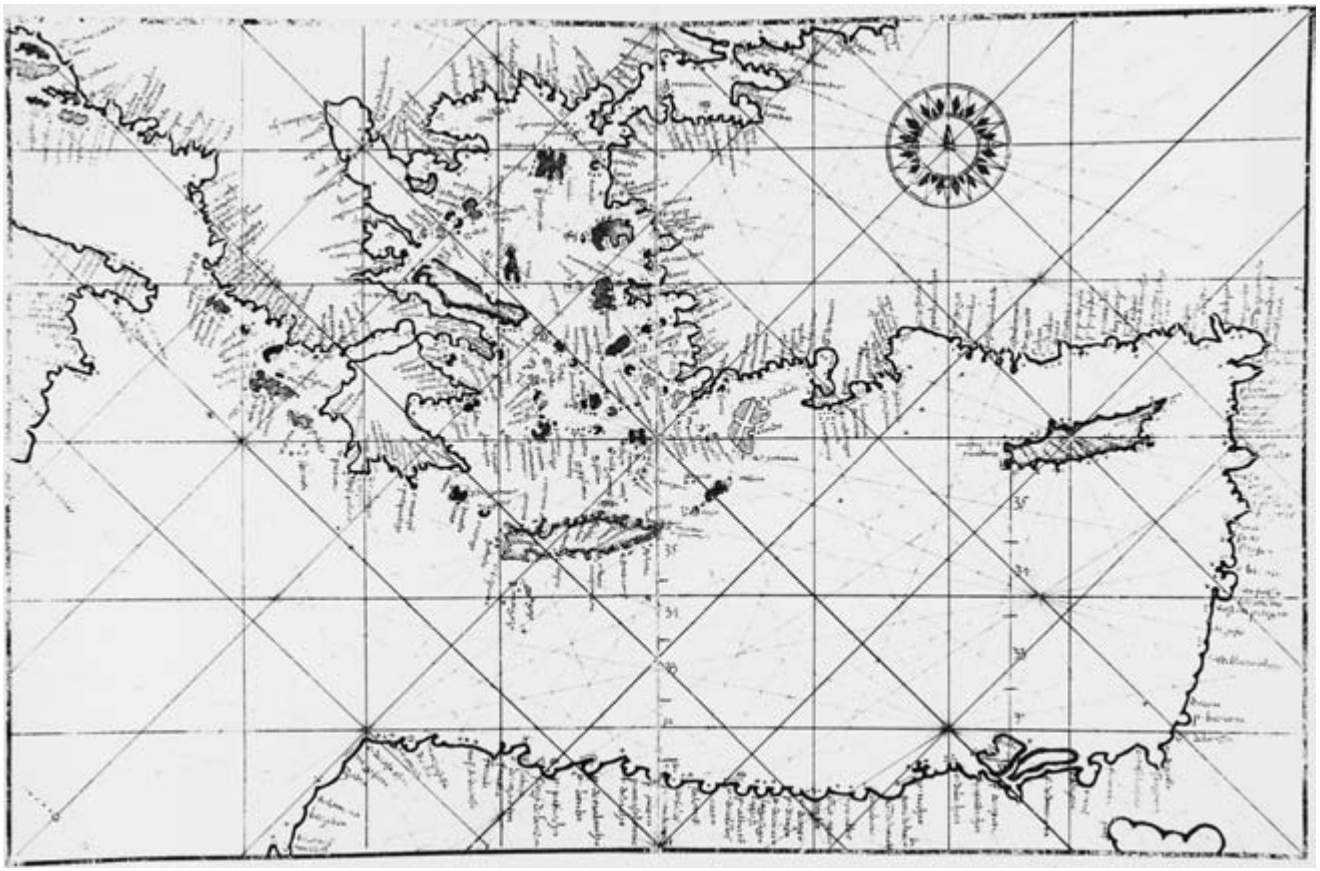

FIG. 7.11. NAUTICAL CHART OF THE MEDITERRANEAN WITH A SCALE OF LATITUDE. A sheet from an atlas attributed to Battista Agnese. Size of the original: 24.5 × 35 cm. Photograph courtesy of the Newberry Library, Chicago (Ayer MS. Map 10).

graphical knowledge, persisted in drawing his charts of the Mediterranean with the sea's axis rotated some ten degrees counterclockwise and then transferred this error to his large world charts—even though he based these works largely on Spanish and Portuguese sources.[125]

One should also remember that, according to recent studies, it seems that while from 1300 to 1500 the eastern bias of magnetic declination in the central Mediterranean was somewhere between eight and ten degrees east, during the course of the sixteenth century this value began to fall—so much so that it was around four degrees in 1600, leveled out at zero degrees around 1650, and thereafter became a western bias.[126] Around the middle of the sixteenth century, the isogonal zero must have passed along the coast of Palestine, while by the beginning of the seventeenth century it passed through Rhodes, and by the mid-seventeenth century it had shifted to Sicily.[127] Hence, the charts drawn up using the traditional representation of the sea no longer corresponded with empirical compass readings.

An atlas attributed to Agnese, which should be dated around 1543–45,[128] contains an interesting detail. The fifth sheet (fig. 7.11), showing the eastern Mediterranean with the usual rotation, also contains two scales of latitude marked in black ink: the first runs from the Nile Delta to the western tip of Cyprus and the second from the coast of the Marmarica to the eastern coast of Crete, with the readings starting from 31°—at two, almost perfectly aligned, points on the African coast—and ending

125. Such as the 1527 world chart in Milan, Biblioteca Ambrosiana, which was destroyed during the bombing of the Second World War, or that dated 1531 and now in a private collection.

126. The variations in magnetic declination over the centuries have been measured through studies of the lava flows of Etna. Ricardo Cerezo Martínez, "Incidencia de la declinacion magnetica en el desarrollo de la cartografia portulana," *Quaderni Stefaniani* 4 (1985): 97–128; Lanman, *Origin of Portolan Charts,* 27–30; and Robert Bremner, "Written Portulans and Charts from the 13th to the 16th Century," in *Fernando Oliveira e o Seu Tempo Humanismo e Arte de Navegar no renascimento Europeu (1450–1650): Actas da IX Reunião Internacional de História da Náutica e da Hidrografia [1998]* (Cascais: Patrimonia, 2000), 345–620.

127. Woronowa, *Der Portolan-Atlas des Battista Agnese,* 29.

128. USCh1. The work is listed as no. XXXVI in Wagner, "Manuscript Atlases," 76–77.

at 35° at both islands, even if it is clear that Cyprus is farther north than Crete (the equal numerical reading for their latitude is possible thanks to the difference in the segment lengths the two scales use to mark each degree). Though one cannot attribute this odd addition to the Agnese workshop, the writing is undoubtedly from the sixteenth century. So the author of this very early attempt to correct the inherited distortion in the cartographic representation of the Mediterranean had realized that Crete and Cyprus were aligned on the same parallel, but seems to attribute the faulty picture given by the chart to an error in calculating the distance between Damietta and Cyprus, which resulted in the location of the island too far to the north of the African coast. The same belief can be seen in the *portolano* written by Barnardo Baroncelli around twenty years later, which explicitly states that Cyprus is generally shown one hundred miles too far north, and that is why the pilots of many ships who thought they were heading for the island ended up on the coast of Egypt: they were misled by the charts they were using.[129] So it is clear that the distortion in cartographic representations had been noted but was attributed to erroneous calculation of distances within the eastern Mediterranean.

Hence, Domingo Olives's 1568 chart and, even more so, the 1586 atlas by Antonio Millo are of particular interest.[130] The latter work, in fact, contains the first extant representation of the Mediterranean with the shift in the axis corrected and Gibraltar, Crete, and Cyprus shown as almost perfectly aligned: the cartographer, aware of the distortion, has not simply corrected it by changing the distance between Cyprus and the African coasts but has rotated the entire axis of the sea, moving the eastern Mediterranean and the Black Sea toward the south.[131] A scale of latitude along the left margin indicates that Gibraltar is 36°N and the two islands are 35°N—readings that are fairly close to modern values. This is the latest extant work by Millo, and it is strange that the correction it contains is not included in other works by him, which date from only slightly earlier—for example, the atlas that dates from 1582–84 (ItRo8). Whatever the explanation for this, there can be no doubt that the change in the later work was certainly a novelty for those Venetians who purchased the chart, accustomed as they were to the traditional medieval representation. Hence, the nature of the error and the way in which it should be corrected were already known to Mediterranean cartographers before the appearance of the printed works by Willem Barents (Barentsz.) and Crescenzio that contained an explicit discussion of the problem.

In 1595 Cornelis Claesz. printed the *Caertboek vande Midlandtsche Zee* by the famous navigator Willem Barents in Amsterdam, and for the first time the pilots of northern Europe were provided with a nautical chart of the Mediterranean that met their requirements. The general chart of the sea, the work of the cartographer Petrus Plancius, may have been drawn up in the style of similar charts being produced in southern European centers of nautical cartography, but it corrects the axis shift in the Mediterranean and shows Gibraltar, Crete, and Cyprus almost perfectly aligned.[132]

Seven years later, in 1602, Bartolomeo Crescenzio's *Nautica Mediterranea* was published in Rome by Bartolomeo Bonfadino.[133] The author states that he has personally experienced the errors in traditional charts thanks to his period as a hydrographer on the galleys of the papal fleet (from 1588 to 1593) and other voyages made as a passenger and observer in the period 1594–95.[134] Crescenzio argues that magnetic declination was zero in the Azores and rose gradually and uniformly from Gibraltar to the

129. Baroncelli wrote: "Mind that in the nautical charts this island is located badly: it should be almost 100 miles further south, because it is barely at 35° latitude, which I have often proved myself using the astrolabe. Damiata, which lies exactly on a line south-north, is at 31 degrees, which is a difference of only 4 degrees—that equals 280 miles—and charts give Cyprus as 390 miles from Damiata. And this is why many ships have put to land between Rossetto and Damiata thinking, thanks to the charts, to be 100 miles away from where they actually are." Sebastiano Crinò, "Metodi costruttivi ed errori nelle carte da navigare (A proposito di un gruppo di carte della Biblioteca Olschki)," *Bibliofilia* 34 (1932): 161–72; idem, "Portolani manoscritti e carte da navigare compilati per la Marina Medicea, I.—I portolani di Bernardo Baroncelli," *Rivista Marittima* 64 (supp. September 1931): 1–125; Simonetta Conti, "Un'originale carta nautica del 1617 a firma di Placidus Caloiro et Oliva," *Geografia* 9 (1986): 77–86; idem, "Le carte nautiche 'doppie' della famiglia Olives-Oliva," in *Momenti e problemi della geografia contemporanea: Atti del Convegno Internazionale in onore di Giuseppe Caraci, geografo storico umanista* (Rome: Centro Italiano per gli Studi Storico-Geografici, 1995), 493–510; and Corradino Astengo, "L'asse del Mediterraneo nella cartografia nautica dei secoli XVI e XVII," *Studi e Ricerche di Geografia* 18 (1995): 213–37.

130. GeB2. Antonio Millo, *Der Weltatlas des Antonio Millo von 1586,* commentary by Lothar Zögner (Süssen: Edition Deuschle, 1988).

131. Corradino Astengo, "La cartografia nautica mediterranea," in *L'Europa delle carte: Dal XV al XIX secolo, autoritratti di un Continente,* ed. Marica Milanesi (Milano: Mazzotta, 1990), 21–25, esp. 25.

132. Plancius is mentioned in the Latin legend: "Thalassographica Tabula totius Maris Mediterranei . . . A. P. Plancio." This legend is also given in Dutch, without any indication of the author's name. There is a presentation copy of this chart, printed on parchment (as was the custom in Holland with such works) and now in the Maritiem Museum, Rotterdam. C. Koeman, "Bibliographical Note," in *Caertboeck vande Midlandtsche Zee, Amsterdam, 1595,* by Willem Barents (Amsterdam: Theatrum Orbis Terrarum, 1970), V–XXI.

133. Osvaldo Baldacci, "Le carte nautiche e il portolano di Bartolomeo Crescenzio," *Atti della Accademia Nazionale dei Lincei: Rendiconti Classe di Scienze Morali, Storiche e Filologiche,* 8th ser., 4 (1949): 601–35, esp. 607.

134. For example, he mentions how the cliff of La Sapientza, shown in maps as being on the same parallel as Cape Spartivento, was in fact one quarter rhumb to the east toward the southwest, and also how he had realized that this error was due to magnetic declination or what he calls "eastern bias" of the compass. Baldacci, "Le carte nautiche," 618–19.

eastern Mediterranean, reaching a maximum value of one rhumb, that is, eleven degrees, fifteen minutes, around the Antioch meridian. He proposes to correct this by rotating the axis eight degrees clockwise around the Azores as fixed center (this figure was calculated as the average for the declination of the Mediterranean).[135]

The work is accompanied by a printed nautical chart, which dates from 1596[136] but is the result of the application of the theories subsequently outlined in detail within the 1602 publication itself. The end result is a satisfactory chart, even if the very decision to use an average value for the correction of the rotation means that the adjustment within the eastern Mediterranean is still insufficient.

A manuscript nautical chart produced in Barcelona by Gerolamo Costo goes to the opposite extreme: it actually rotates so far in the opposite direction that Cyprus is shown some distance to the south of Crete (ItGe14). Though this, the only extant work by the Genoese cartographer, is undated, we do know that in 1605 Costo took over from Jacopo Maggiolo as the official *magister cartarum pro navigando* to the Republic of Genoa, holding the post until his death in 1607; and since the *magister* was required to live and work exclusively in Genoa, the Barcelona chart must date from before his appointment (and perhaps from before the publication of *Nautica Mediterranea*).

Genoa was also where, in 1613, Giovanni Francesco Monno produced a nautical chart bearing the following inscription: "A chart of the Mediterranean purged of ancient errors now with the correct latitude of places as well as the strength of the winds" (ItGe16). The work has a corrected axis and a scale of latitude, running from 22 to 52°N, that shows Gibraltar, Crete, Cyprus, and the Nile Delta all correctly located. The same can be said of Monno's charts of 1622[137] and 1629 (UKL39) and of the general and individual charts illustrating his treatise "Arte della Vera Navigatione," produced in 1633 (ItGe3). Though he does not explain the procedure he used to correct the traditional error, Monno's results are more than satisfactory.

The problem was then tackled by the cartographer Joan Oliva, whose fifteen-chart atlas produced in Messina in 1614 (SpP6) contains two charts of the eastern Mediterranean drawn to slightly different scales. One of these uses the traditional medieval rotation of the axis counterclockwise, and the other has a corrected axis (showing Crete and Cyprus aligned on the same parallel). Two almost identical sheets are to be found in Oliva's much more famous 1616 atlas, produced at either Messina or Leghorn.[138]

Proceeding in chronological order, one then comes to the double nautical chart (fig. 7.12) produced in Leghorn in 1618.[139] This large parchment is divided into an upper half showing the area of the Mediterranean with the traditional medieval rotation of the axis and a lower section with a corrected view of the Mediterranean basin; thus it is possible to compare the two directly. Both parts have a scale of latitude, and that in the lower chart shows the Straits of Gibraltar at 36°N; Crete at 35°30′N; and Cyprus at 35°N (hence there has been excessive compensation in the eastern Mediterranean). It has been pointed out that in drawing the lower chart Oliva rotated the axis of the upper chart through an average nine degrees clockwise, though the correction diminishes slightly from west to east; clearly this—rather than Crescenzio's—represented the generally held opinion as to the distribution of magnetic declination over the Mediterranean.[140]

Joan Oliva's successor in the Leghorn cartographic workshop was the Genoese cartographer Giovanni Battista Cavallini, whose copious output is characterized by the new schema for representing the Mediterranean. As in the case of its predecessor, the correction of compass lines appears to be exaggerated so that Cyprus lies more to the south than Crete, which proves the difficulty of assessing either the margin of error or the degree of local cartographic distortion. The most notable example is of the island of Cyprus, which is correctly oriented in traditional charts but appears in modified charts as rotated clockwise and erroneously turned from east to west.

In spite of the traditional conservatism of many cartographers and seamen in general, the depiction of the Mediterranean aligned with geographical north gradually became widespread and was taken up, for example, in the 1644 chart by the Genoese Alberto de Stefano, which bears the inscription "This chart was made to give a cor-

135. Baldacci, "Le carte nautiche," 620–21, and Giovanni Maria Mongini, *Una singolare carta nautica "doppia" a firma di Joannes Oliva (Livorno 1618)* (Rome: Università di Roma, Facoltà di Lettere e Filosofia, Istituto di Geografia, 1975), 9.

136. *Chartam Mediterraneam . . . ab antiquis erroribus purgatam . . . Romae anno a Virginis Partu 1596. Inventor Prothei.* The "Inventor Prothei" is Crescenzio himself, who the previous year had devised this rather odd multiuse instrument. Baldacci, "Le carte nautiche," 605–7. A manuscript nautical chart by Crescenzio (FiH3) also dates from 1596.

137. Durazzo-Giustiniani private library, Genoa.

138. ItFi34. Corradino Astengo, "L'Atlante nautico di Giovanni Battista Cavallini conservato presso il museo di storia della scienza di Firenze," *Quaderni Stefaniani* 4 (1985): 139–56, esp. 151.

139. ItRi1. Mongini, *Una singolare.*

140. Another example of the double depiction of the Mediterranean can be found in a 1617 chart drawn up in Messina and signed by Placido Caloiro e Oliva. Now in a private collection, this work is described in Conti, "Un'originale." The layout is very similar—though not identical—to that of a 1618 chart by Joan Oliva, but the work is much richer in decoration (this is a constant feature in the work of Placido Caloiro e Oliva, who was totally lacking in originality as a cartographer, eschewing innovation in favor of simple adherence to models that were already out of date). This led Conti to suggest that, judging from the layout, the double chart of 1617 must be the work of Joan Oliva—perhaps one he left unfinished, which was then completed and signed by the other member of this famous family of cartographers.

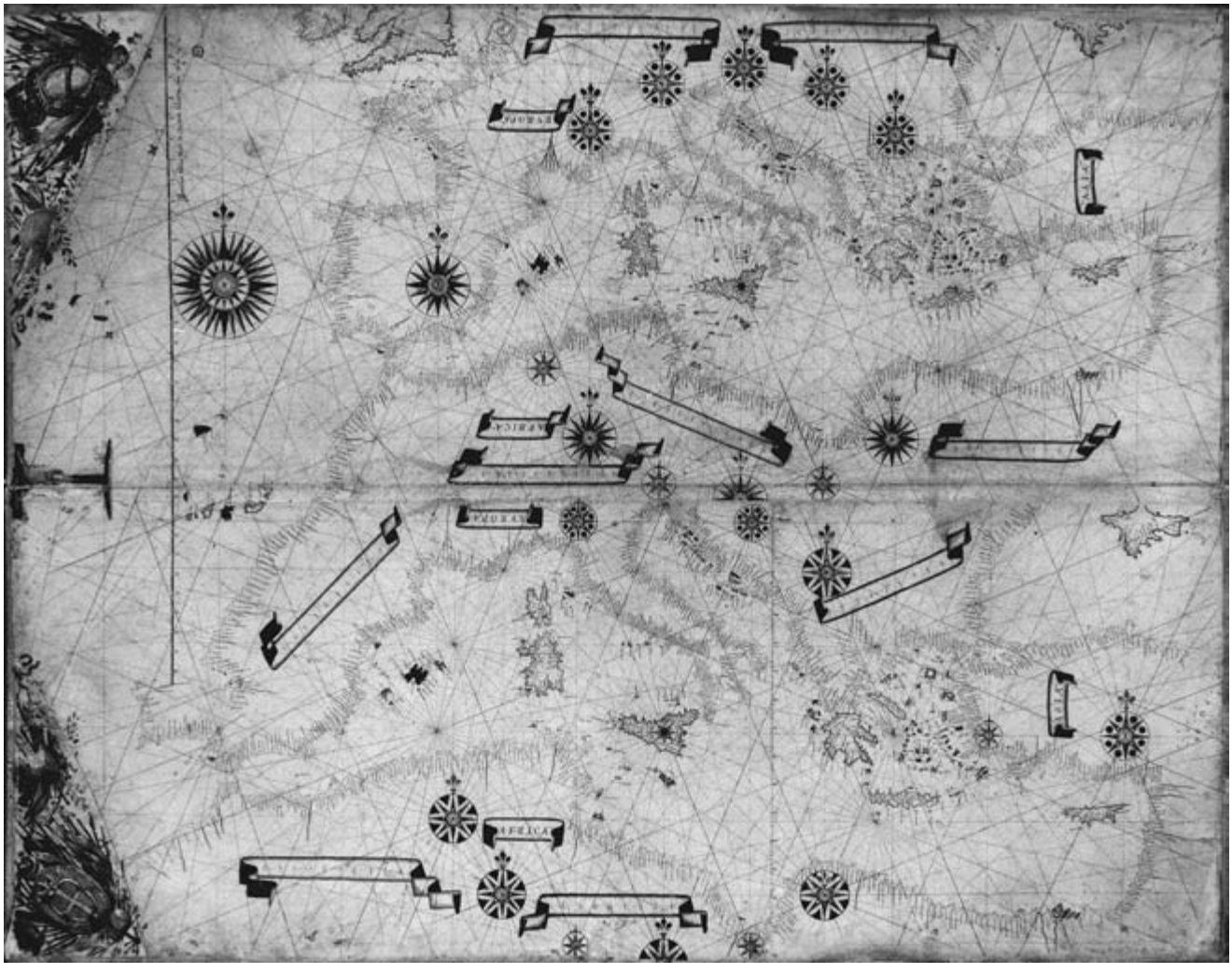

FIG. 7.12. DOUBLE NAUTICAL CHART OF THE MEDITERRANEAN. Joan Oliva, Leghorn, 1618. Size of the original: 72.4 × 92.7 cm. Photograph courtesy of the Biblioteca Civica Gambalunga, Rimini (Manuscript Room).

rection of one rhumb."[141] The correction of the axis of the Mediterranean can also be seen in the works produced by the Marseilles cartographic workshop, the last to engage in Mediterranean cartography before it too ultimately ceased production.[142] Given that this feature became so frequent in seventeenth-century charts of the

141. UKGr20. The work bears the inscription "Navigation chart by the hand of Alberto de Stefano, navigator of the noble city of Genoa, Year 1644." Crinò, "Metodi costruttivi," 161. Curiously enough, the rotation of the Mediterranean is the same as that in a small atlas produced by the same cartographer in Genoa in 1645—a work that once belonged to Baron Walckenaer and is now in the BL (UKL45).

For an interesting study on the BL's acquisition of fifteenth-century manuscript charts from Venice through a Swedish private collector in Florence, see Francis Herbert, "Jacob Gråberg af Hemsö, the Royal Geographical Society, the Foreign Office, and Italian Portolan Charts for the British Museum," in *Accurata descriptio* (Stockholm: Kungl. Biblioteket, 2003), 269–314.

142. In an atlas produced in Marseilles around 1620 (USB1), Augustin Roussin depicts the Mediterranean with the traditional medieval counterclockwise rotation; but in the left margin he gives a scale of latitude that is inclined at an angle to the axis—and thus makes it possible to correct it. However, the correction goes too far in the opposite direction: if one rotates the entire chart so that the scale of latitude is aligned north-south, Crete and Cyprus are at around 35° north, which is roughly correct, but Gibraltar ends up at 39°N, which is three degrees off.

During the period 1640–65 Marseilles was also home to François Ollive, another member of the illustrious family of cartographers, who probably took over the workshop of Salvatore Oliva, who had been active in the first half of the century. François must have been particularly prolific, given that there are more than thirty extant works that are either signed by or can be attributed to him with certainty (due to the unmistakable rich style of the floral decoration and the predominance of the colors orange and green). Most of his charts show the Mediterranean with the usual medieval counterclockwise rotation. However, at a certain point in his career, the cartographer seems to have become aware of the error and tried to make empirical corrections—as one can see in the large 1662 chart (FrP50) and the 1664 chart (FrP61). In both works, however, his correction of the inclination goes just a bit too far. Astengo, "L'asse del Mediterraneo," 234.

Mediterranean, some scholars have used it as a criterion for dating works without clear authorship.[143]

In 1661–62 Francesco Maria Levanto drew up a general chart of the Mediterranean and a number of regional charts that were subsequently bound together as a single-volume atlas.[144] Here the clockwise rotation to correct the traditional axis seems to pivot around Malta rather than Gibraltar or the Azores. Though good, the end result is not entirely satisfactory, and Levanto himself seems to have realized as much, given that in his nautical manual *Specchio del Mare Mediterraneo* (published in Genoa in 1664) he recommends that pilots make more use of astronomical navigation. However, his work, entirely based on material published in the Netherlands, can hardly be considered original.

In effect, all the Mediterranean cartographers made the mistake of attempting to correct the distortion in charts on the basis of a contemporary—and, what is more, average—value for magnetic declination, without taking into consideration that it varied over time and space. A precise chart of the Mediterranean would be possible only when new measurements were taken, no longer based on directions and distance (that is, on navigational routes) but on the coordinates of various places (that is, on astronomical observations). Work on such new measurements began around 1680 and lay the basis for modern nautical charts of the Mediterranean.

Ornamental Features

Ornamental features are an important part of these charts, which were designed for a public of aristocrats, prelates, merchants, scholars, and rich bibliophiles (fig. 7.13).[145] It has been argued that, more than other features, decorative features may serve to identify the author of an anonymous chart or at least establish its workshop of provenance; Caraci himself does not deny that one might draw up a table of these aspects that facilitate identification, giving more weight to those for which the author was not bound by standard cartographic practice and could give free rein to his own personal taste.[146] However, he points out the need for caution here, because a number of anonymous charts are fakes by people who obviously tried to imitate such superfluous features. Baldacci makes the further point that richness of decoration does not necessarily help when it comes to establishing the author or workshop that produced an anonymous chart, as it may well have been added much later.[147]

Similarly, the level of decoration within a single cartographer's work can vary according to the requirements or financial means of the person commissioning a particular chart or in response to market demands.[148] Take, for example, the two charts Joan Oliva produced in Leghorn in the year 1624 (CeO1 and CeO2): one has only a number of compass roses, a representation of Golgotha with the Cross (to indicate the position of Jerusalem), and a further image of Christ on the Cross decorating the neck of the chart, while the other has not only the roses and depiction of Golgotha but also the monogram "IHS" inscribed within a rose (on the neck), two large roses within which the two hemispheres are inscribed, thirty-four miniatures of cities, and, within Africa, six animal figures. The scrolls containing the scales also vary, with flowing banderoles in the former, elaborate multicolored frames in the latter. However, in spite of these necessary reservations, an analysis of the decoration of nautical charts is clearly important, and it is regrettable that so far this aspect has received only scant attention. A general index of these features (preferably illustrated) would be most useful.

During the course of the sixteenth century, the custom of decorating the neck of the chart with a religious image became the norm (it had first started around the middle of the previous century).[149] Baldacci argues that crucifixes, Madonnas, and saints are the expressions of a typically Mediterranean exuberance in religious faith; indeed, he goes so far as to suggest that they are "a clear and confident declaration of Catholicism, in deliberate opposition

143. Winter, for example, concluded that an anonymous nautical chart (SpM5) that had previously been held to be medieval was, in fact, from the seventeenth century because it contained a striking attempt to correct the inclination of the axis of the Mediterranean: "We can see at the first glance that the mouth of the Nile is lower than the Strait of Gibraltar! The intention was, therefore, to correct the old, false orientation. In correct orientation the horizontal line representing the 36th parallel, cited above, must run to the south of the Bay of Iskanderun. Here, on this chart, it happens to appear as the central horizontal of the net of lines, but it is found exactly as far to the north of the bay as it ought to be to the south! The turn back to the right here made therefore goes too far! Nevertheless the effort towards a correction has to be acknowledged as a step forward." Winter, "Late Portolan Chart," 43.

144. Durazzo-Giustiniani private library, Genoa.

145. Probably the definition "purely ornamental features" is not totally exact, given that many of them (miniature views of cities and depictions of sovereigns, plants, animals, and flags) complete the information given by the chart, even if with nonnautical details. They "provide geographical, general, physical, anthropological, and economic information for people who would have been interested in general political information on the countries of Europe and on the Asian and Africa nations bordering on the Mediterranean and the oceans." Baldacci, *Introduzione allo studio,* 61.

146. Caraci, "Le carte nautiche anonime," 171.

147. Baldacci, *Introduzione allo studio,* 60.

148. Decoration must have had a sizeable influence on the prices charged for charts and atlases. According to Rey Pastor and García Camarero, "Each rose, each king, each ship and each monster, pushed up the price" (*La cartografía mallorquina,* 14 n. 2).

149. Campbell points out that the 1464 chart by Petrus Roselli is the first in which the miniature of the Madonna and child appears, while the 1464 chart by Nicolò Fiorino bears only the monogram IHS (Campbell, "Portolan Charts," 398).

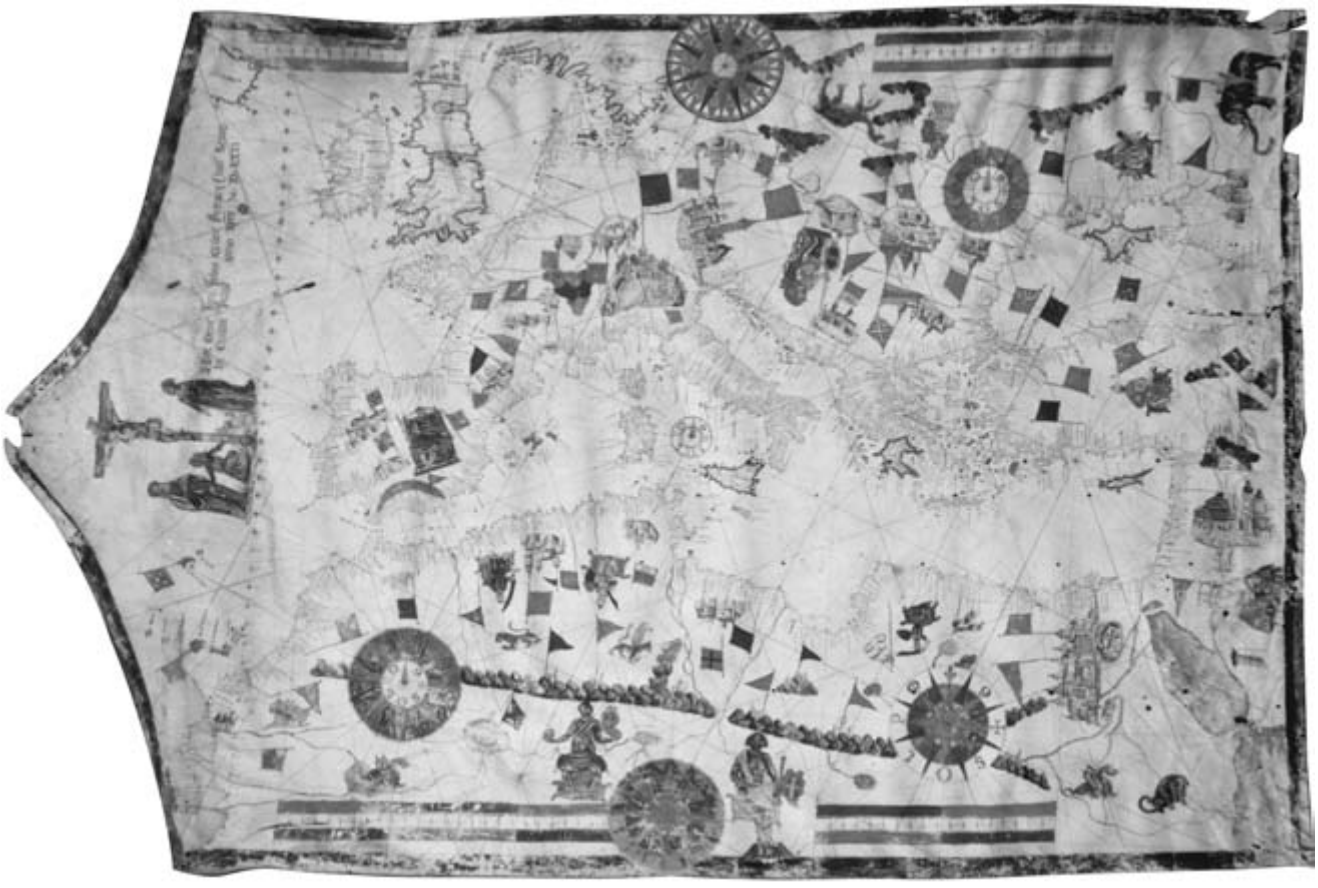

FIG. 7.13. EXAMPLE OF A RICHLY DECORATED NAUTICAL CHART OF THE MEDITERRANEAN. Giulio Petrucci, Pisa, 1571. Size of the original: 62 × 93 cm. Photograph courtesy of the Museo della Specola, Department of Astronomy–University of Bologna (inv. MdS-101).

to an increasingly widespread Protestantism."[150] Whatever the reason behind them, these religious images most commonly take the form of a Madonna and child, and within the wide variety of poses and styles there are some that can be identified with one particular cartographer, family of cartographers, or workshop.

The Genoese cartographers Vesconte and Jacopo Maggiolo seem to have favored an enthroned Virgin with the Christ child in her arms, while the other members of the family—Giovanni Antonio and Baldassare—represent the Virgin either standing or seated on a cloud as she holds the Christ child. Images of the Blessed Virgin standing on a crescent moon appear on the neck of some charts by Jaume Olives and Joan Martines[151] and in many of the works of Giovanni Francesco Monno. The Madonna of the Letter, the object of particular veneration in Sicily, often appears in the charts of the later members of the Oliva family and in those produced by the Caloiro e Oliva family in Messina,[152] while Vincenzo Volcio tended to prefer an oval miniature of the Virgin holding the Christ child that is enclosed within a richly decorated rectangular frame.[153] Baldacci has pointed out that the image that often occurs in the charts of the Catalan Matteo Prunes—a standing Virgin holding the Christ child in her left arm while in her right hand she holds a bunch of long-stemmed lilies—is very similar to that of the effigy of Nuestra Señora del Buen Suceso, which was venerated at Palma de Mallorca.[154]

Naturally enough, perhaps due to the express desire of a client, a cartographer might opt for something other than his usual religious image. For example, Jacopo

150. Baldacci, *Introduzione allo studio,* 84. The saints accompanying the Madonna or the scene of the Crucifixion are figures such as Saint Nicholas, Saint Clare, and Saint John.

151. Caraci, "Le carte nautiche anonime," 199.

152. Caraci, "Le carte nautiche anonime," 205.

153. Caraci, "Le carte nautiche anonime," 200.

154. The latter figure holds a scepter rather than a lily in her right hand. Osvaldo Baldacci, *La geocarta nautica pergamenacea catalano-sassarese [Biblioteca Universitaria di Sassari, MS. 248]* (Rome: Pubblicazioni dell'Istituto di Geografia dell'Università di Roma "La Sapienza," 1989), 25.

Russo generally uses full or half-figure images of Virgin and child, often enclosed within a circle or a wind rose, but in his 1528 chart produced in Messina he includes two unidentified male saints and depicts the Madonna holding the child in her left arm while with a knotty club in her right hand she beats off a demon that threatens a smaller-scale human figure clinging to her gown.[155] It is curious that though extremely unusual, this image also appears in a 1571 chart Matteo Prunes produced in Majorca (ItGe11).

A blood-soaked Christ on the cross is rather common in the charts of Joan and Francisco Oliva, and also appears occasionally in other contemporary charts. Sometimes the Crucifixion scene also includes the Virgin, Mary Magdalene, and Saint John.[156] A curious variation on this theme is to be found in an anonymous chart in the Biblioteca Apostolica Vaticana, which Caraci attributed to Domenico Vigliarolo: the neck is decorated with a Pietà, with the Virgin cradling her dead son at the foot of the cross.[157]

Religious images are less common in atlases. Where they do appear, they are sometimes a sort of frontispiece, usually occupying the entire recto of the second sheet (that is, the right half of the first double sheet). The compositions here tend to be more complex, as in the scenes of the Crucifixion in the 1580 atlas by Joan Riczo Oliva (SpM8), the 1582 atlas by Joan Oliva (SpP5), and the 1600 atlas by Vicente Prunes (SpBa6), or in that of the Annunciation in the 1592 atlas by Joan Oliva (SpBa3).

Overall, these illustrations hardly reflect the painting of the period and are much closer to more popular religious images, such as an *ex voto*.[158] Indeed, in later works—such as the 1639 atlas by Placido Caloiro e Oliva (ItVe21) and two anonymous atlases (ItGe5 and ItGe6)—the miniatures are actually popular religious prints just stuck onto the parchment and so should perhaps be considered as expressing the religious piety of the owner rather than that of the cartographer.

Another equally important feature comprises the various small pictures of cities. Generally, these are economic, standardized representations of a city, an ideogram that shows a defensive wall, a gateway, a few houses huddled together, and a few tall buildings (such as towers and bell towers) that give the image a certain upward thrust and thus convey the idea of prosperity and power.[159] A blue line along the bottom of the drawing indicates that this is a coastal city—or, in the case of such cities as Avignon and Paris, which are far from the coast, the line may indicate a river.[160] Along with these conventional representations of cities there are also the more realistic views of the very important cities, incorporating one or two characteristic details that serve to identify them (fig. 7.14). As early as the second half of the fourteenth century, nautical charts contained views of Genoa and Venice that were

FIG. 7.14. MINIATURE OF GENOA, WITH THE PORT AND THE LANTERNA. Detail from a sheet in a nautical atlas by Vesconte Maggiolo, Naples, 1512.
Size of the original: 33.5 × 48 cm. Biblioteca Palatina, Parma (MS. Parm. 1614). By concession of the Ministero per i Beni e le Attività Culturali.

recognizable—the former thanks to its curved harbor, its quays, and the Lanterna (lighthouse), the latter thanks to the square and bell tower of St. Mark's. During the period under consideration here, there would also be rec-

155. UKBi1. The miniature is badly damaged, and thus Almagià was misled into interpreting it as showing Saint George fighting the dragon (Almagià, "I lavori cartografici," 304).

156. As is the case, for example, in the chart drawn up in Pisa by Giulio Petrucci in 1571 (ItBo10).

157. V16. Caraci, "Le carte nautiche anonime," 167–93.

158. Caraci, "Le carte nautiche anonime," 200 n. The *ex voto,* made in response to a promise, is an artistic form typical of the Mediterranean basin. In general, such images are small paintings that contain religious subject matter commissioned from modern artists or local artisans to be donated to churches or sanctuaries to fulfill a promise made to the Blessed Virgin or a saint.

159. Paul Zumthor, *La Mesure du monde: Représentation de l'espace au Moyen Âge* (Paris: Éditions du Seuil, 1993), 122–24.

160. Rosselló Verger, "Cartes i atles portolans," 27.

ognizable depictions of Marseilles (with its Vieux Port and the windmills above the old city), Barcelona (with Montjuic and its signaling tower), and Ragusa (with its fortified harbor). Jerusalem was often identified by the dome of the temple and the three crosses of Calvary.

The style of these urban vignettes also varied somewhat according to cartographer and workshop or even from chart to chart by the same cartographer.[161] For example, in a 1560 chart (ItVe39) Matteo Prunes shows Venice enclosed by a nonexistent wall, while in his 1578 chart (ItVe40) he still gives a rather fanciful account of the city but does include the realistic detail of the *piazzetta* alongside the doge's palace with its two columns.[162]

It is clear that these urban images were of no use to sailors; in fact, they are generally oblique aerial views and so do not even coincide with what one might see upon approaching the city from the sea. What is more, the details given, such as the Lanterna, Montjuic, or St. Mark's bell tower, were so well known that they were indelibly fixed in the memory of each and every sailor. Thus, the pictures must have served merely as general information—and also as fill-ins that were pleasing to the eye. So as not to interfere with the uninterrupted sequence of place-names given along the coasts, maritime cities are actually depicted inland, totally out of geographical context and apparently floating above the ground;[163] in some ways they recall those relief models of cities held in the palms of patron saints in medieval and Renaissance depictions. Lack of space also meant that important maritime centers such as Messina,[164] Naples, and Palermo were omitted, while Ancona and Rome, two cities that were important in the business interests of the Benincasa family, make an appearance (in two minuscule vignettes) only in the 1508 chart by Andrea Benincasa. In contrast, the huge empty space of northwest Africa between the Gulf of Sidra and the Gulf of Guinea was in Jacopo Maggiolo's 1561 chart filled with a good twenty-nine drawings of cities—most of them imaginary.[165]

In sixteenth-century nautical charts, the urban vignettes in Europe are aligned northward and those in Africa southward, thus forming a mirror image on either side of the Mediterranean, while in those of the seventeenth century (and in the work of the Oliva, Caloiro e Oliva, and Cavallini families in particular) they all tend to be aligned westward, so that the neck of the chart has to be facing upward if one is to see them properly—a fact that would seem to bear out Caraci's claim that this neck was used to hang nautical charts from the wall.[166]

Framed realistic views of cites are found in the 1620 Marseilles atlas by Charlat Ambroisin. Along the upper edge of the chart showing the western Tyrrhenian Sea and the Channel of Sicily are images of Palermo, Messina, Trapani, and Malta (La Valletta).[167] However, the chart is not original but is a general copy of that in Willem Barents's *Nieuwe beschryvinghe ende caertboeck vande Midlandtsche Zee*. This custom of aligning views of cities along the margins of nautical charts undoubtedly came from Dutch wall maps and was also taken up in François Ollive's 1664 chart, the upper border of which bears vignettes of Marseilles, La Ciotat, and Toulon, with the lower border bearing vignettes of Algiers, Tunis, Tripoli, and Alexandria (important ports of call for Marseilles shipping in that period).

As in the fourteenth and fifteenth centuries, multicolored flags were used to indicate cities and place-names of special importance. Although the studies of earlier scholars have shown how the medieval flags were particularly accurate from a heraldic point of view, Campbell's work has raised questions about the claim that they were an indication of political allegiances that provided sailors with a source of precise information.[168] During the course of the sixteenth and seventeenth centuries, these flags became much more vague and repetitive, often using such frankly imaginary symbols as a host and chalice to indicate Jerusalem (e.g., ItMi2bis) or a cockleshell to indicate Santiago de Compostela,[169] thus limiting themselves to giving religious and cultural—but certainly not political—information. Much more care and detail can be seen in the coats of arms used to identify the emergent states of the day.

The custom of emphasizing coastlines with different colors continued, and during the course of the seventeenth century these colors not only became more vivid but also (as in the later Marseilles charts) served to indicate different historical regions. In line with a tradition that undoubtedly dates from the medieval *mappaemundi,* the Red Sea is colored red, with a caesura to the north that symbolizes the Jews' passage out of Egypt. River deltas and the less important islands are always fully colored using red, blue, green, and gold, while Majorca, for

161. Caraci, "Le carte nautiche anonime," 173 n. 12.

162. Giandomenico Romanelli, "Città di costa: Immagine urbana e carte nautiche," in *Carte da navigar,* 21–31.

163. Romanelli, "Città di costa," 21.

164. There is, however, a detailed, realistic view of Messina in the frontispiece to the 1596 atlas by Joan Oliva (SpM16).

165. Probably the large depiction of Cairo sprawling along the banks of the Nile, which can be found in the work of the Ancona cartographers Conte di Ottommano Freducci and Rocco Dalolmo, is only such a size (it is larger than the miniatures of Venice and Genoa put together) because of the space available. Baldacci, *Introduzione allo studio,* 113.

166. Caraci, "La carta nautica del R. Archivio di Stato in Parma," 183.

167. FrP37. In this case, these are not so much views as actual city plans with perspective rendition of details—the whole realistically located in the surrounding territory.

168. "Many a Christian sailor would have ended up a galley slave had he relied on his chart to distinguish friend from foe." Campbell, "Portolan Charts," 401.

169. The shell against a red background appears in some charts by Jaume Olives and Bartomeu Olives.

example, is generally in the colors of the House of Aragon: red and gold. The island of Rhodes is shown in red with the silver cross of the Knights Hospitaller of Jerusalem, and would go on being so even after the island had fallen to the Ottoman Turks, so that from the second half of the sixteenth century to the end of the seventeenth century the same colors would be used for both Rhodes and Malta, the order's new headquarters. A similar persistence can be seen in the depiction of Chios, which fell to the Turks in 1566 but was still shown with the Genoese symbol of a red cross on a white background. Apparently there was a certain reluctance to register these territorial defeats of Christianity as final.

The figure of the sovereign was another decorative feature, though of no practical use to sailors and often out of date.[170] Such figures are fairly common in the works of Pietro and Jacopo Russo, Vesconte and Jacopo Maggiolo, and Battista Agnese, as well as being sometimes found in works by the Prunes, Oliva, Caloiro e Oliva, and Roussin families. European monarchs are depicted either enthroned or standing alongside an escutcheon bearing their coat of arms, while African or Asian monarchs are shown seated on a carpet or cushion (often in front of an Arabian-style pavilion). The African sovereigns are partly imaginary: for example, the ruler of an area along the southern stretch of the Nile is given as Prester John, a mythical medieval figure who would disappear from nautical charts only at the end of the sixteenth century.[171]

White spaces are filled with pictures of large ships, galleons, and carracks adorned with the flags of the major European powers as they crisscross the oceans with billowing sails. In atlases, and those of the seventeenth century in particular, the ships within the Mediterranean also include galleons flying the flags of the religious orders of knights. Nevertheless, the drawings are so basic and generalized that they provide no real information on the types of shipping actually being used at the time.

Generally there are no images of sea monsters, which may in part be due to contemporary confidence in man's ability to achieve dominion over the seas (the monsters were a symbol of that terror of the unknown that the sea had inspired in previous centuries). Only in the later works of the two Cavallinis do such images make a reappearance, but here they are more fanciful than threatening and include not only large whales but also sirens and the horses drawing the chariot of Neptune.

The area of North Africa contains drawings of such real or imaginary animals as lions, elephants, camels, monkeys, ostriches, dragons, and unicorns. This type of decoration would become very common from the second half of the sixteenth century onward, to fill in the white space left by the removal of the "Carena"—that erroneous extension of the Atlas Mountains all the way from Morocco to the Nile. Baldacci has pointed out that these drawings are closer to the classical tradition than to the images in medieval bestiaries and has also observed that some animal images tend to recur in the works of a particular cartographer: for example, the figure of an ostrich with a knotted neck appears frequently in the works of Matteo Prunes.[172]

Other decoration might include the heads of wind-blowing putti, frames decorated with geometric motifs, stylized fronds or laurel leaves, or corner pieces and scrolls decorated with floral motifs. And, as the seventeenth century progressed, the baroque taste for overabundance made itself felt here as well. In effect, the variety is such that, in spite of the widespread practice of copying, it is practically impossible to find two charts that are perfectly identical, even within the work of the same cartographer.

Numerous other ornamental features occur only exceptionally, for example, the dividers decorating three sheets in the 1592 atlas by Joan Oliva (SpBa3), the astrolabe on the last sheet of the atlas attributed to Francesco Ghisolfi (fig. 7.15) (ItGe2), and the three pictures of mythological subjects in the 1546 atlas by Battista Agnese (RP1).[173] These illustrations helped to make the products of cartographic workshops unique; and perhaps it is this feature that explains why the business of manuscript nautical cartography flourished in spite of competition from printed maps. In the *studiolo* or *Wunderkammer* of a prince, just as in the humbler dwellings of the bourgeoisie, the rare and the exclusive still occupied a place of honor.

Place-names

The works of the sixteenth and seventeenth centuries undoubtedly bear out Campbell's claim that place-names are "the lifeblood of nautical charts."[174] Such names are an essential feature of all maps, but particularly of nautical charts: not only do they form a key link with the oral tradition of seafolk, which is one of the bases on which they are constructed, but they also serve to link together chart and *portolano* (and thus make combined use of these two navigational instruments possible). However, perhaps even more important, place-names were the very

170. For example, Jacopo Maggiolo's charts continued to have two figures, for the Re de Rossia and the Re de Moscovia, when Ivan IV was both czar of Russia and duke of Muscovy.

171. Prester John was still being portrayed in a Jacopo Maggiolo chart of 1602. However, the date does seem to have been altered.

172. Baldacci, *Introduzione allo studio,* 84, and idem, *La geocarta nautica,* 21–22.

173. The three pictures show the departure of the Argonauts, the escape of Aeneas's fleet from the storm and its heading for Carthage, and the two Atlases.

174. Campbell, "Portolan Charts," 415.

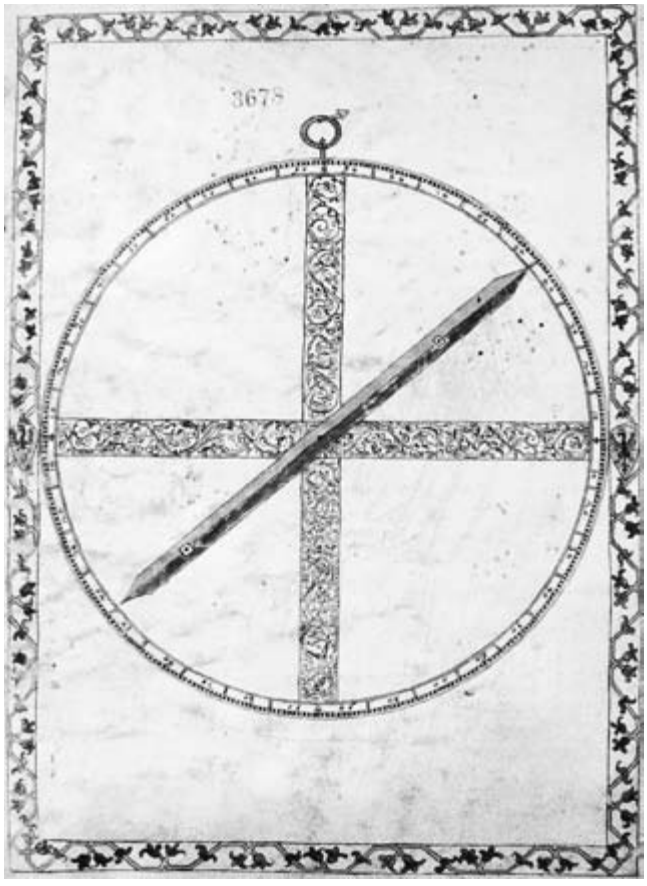

FIG. 7.15. NAUTICAL ASTROLABE. Sheet from an atlas attributed to Francesco Ghisolfi.
Size of the original: ca. 33 × 23 cm. Biblioteca Universitaria, Genoa (MSS. G. V. 32). Authorization granted by the Ministero per i Beni e le Attività Culturali.

key whereby contemporary scholars and men of culture could interpret the geographical information contained in a chart. Hence, the argument that place-names are, in effect, an ornamental feature and, from a technical point of view, are much less important than the tracing of coastlines is totally unfounded.[175]

What was important was not the choice of place-names or their correct spelling but rather their ordering in an exact sequence along the coast. It is this feature—more than the precision of geographical details or of the network of wind rhumbs—that most strikes the observer. That cramped list of place-names, each written perpendicular to the coastline, is the essential characteristic of nautical charts. This is how the Arab historian Ibn Khaldūn put it in his *Prolegomeni:* "All the countries that are on the two shores of the Rūmī Sea (the Mediterranean) are written on a sheet in the form they actually have and in order of the position they occupy on the shores of the sea; together with these all the various places from where the winds blow and the different directions of the winds are drawn in on the sheet, which navigators call a *kunbās,* and which they use as the basis for their voyages."[176]

Comparing the outline of the Italian peninsula as shown in two charts drawn up in Naples by Joan Riczo (alias Oliva) in 1587 and 1588 respectively, Caraci calculated that there were apparently inexplicable variations in around 20 percent of the place-names given (though the total of such names was practically identical).[177] Though this would seem to be an exceptional case, even here there are no errors in sequence or important omissions. It is therefore possible that when charting the Italian coastline the chartmaker had more place-names at his disposal than actual space to write them, and so chose different ones on each occasion.

Caraci also observes that these late products also reveal a certain care in keeping information up to date with contemporary shipping. This would account for the fact that in the charts of the second half of the sixteenth century and later about 20 to 30 percent of medieval place-names on the Italian peninsula disappear,[178] and 15 percent of the names given are those of ports and towns that either were newly founded or had grown during the early modern period (and, in some cases, are the names of small bays that had acquired importance due to the increase in very low-tonnage shipping). Campbell questions this, pointing out a number of omissions in Kretschmer's list of medieval place-names that Caraci uses as the basis for his comparison; according to him, the new additions account for only 6 percent of the total—but even that is not an entirely negligible figure.[179]

The name of a place might differ according to the nationality of the chartmaker, the source he used, or the place in which he was working. Clearly there was a tendency to write at least some geographical names in one's own language or dialect, and Rosselló Verger argues that the most serious errors occurred when the chartmaker (or his amanuensis) understood (or thought he understood) the literal meaning of the original name and tried to translate it, causing nothing but confusion.[180] What is more, frequent misspellings and distortions—above all in later charts—go hand in hand with imprecise renditions of the coastline and rather shabby decorative features.

Baldacci tries to explain these variations in place-names by suggesting that the copyists were illiterate and

175. Alberto Capacci, *La toponomastica nella cartografia nautica di tipo medievale* (Genoa: Università degli studi di Genova, Centro Interdipartimentale di Studi Geografici Colombiani, 1994), IX.

176. Quoted in Carlo Alfonso Nallino, "Un mappamondo arabo disegnato nel 1579 da 'Alî ibn Ahmad al-Sharafî di Sfax," *Bollettino della Reale Società Geografica Italiana* 53 (1916): 721–36, esp. 734.

177. Caraci, "Inedita Cartographica," 169.

178. Caraci, "Inedita Cartographica," 170.

179. Campbell, "Portolan Charts," 422 n. 348.

180. Rosselló Verger, "Cartes i atles portolans," 24.

when transcribing what they could not actually read had no qualms in altering it to fit the space available.[181] Caraci, on the other hand, puts forward the idea that the copyists and apprentices may well have written to dictation rather than following a list of place-names.[182]

Overall, place-names refer either to coastal settlements or to geographical features. In analyzing representations of the coast of the Mediterranean from Narbonne to Cartagena, Rosselló Verger points out that more than 50 percent of these geographical features are headlands or promontories, a figure that seems to apply to the whole area of the Mediterranean: a headland was not only an obvious landmark for the sailor but often also provided safe harborage. He also points out that the names for physical features, such as promontories, bays, or the mouths of rivers, are never given in red ink (that is, are never considered of particular importance).[183] This claim does not, however, hold for charts outside the area covered by his study: in numerous works by Giorgio Sideri, Joan Martines, Joan Oliva, and François Ollive, the cliff of La Sapientza—an important landmark for those making toward the Greek port of Modon (Methone)—is indicated in red ink. And in other charts, along the Atlantic coast of Africa, where settlements were few and far between, numerous promontories, bays, and rivers are given in red.

Rosselló Verger also points out that between Narbonne and Cartagena there can be from three to six place-names of less important settlements, hence written in black ink, between each pair of red ink names. This might lead one to suppose the cartographers were aiming for a certain symmetry and were therefore partially guided by aesthetic considerations; but here again this distribution of differently colored names does not apply in other areas: along the coast of Africa there are often long uninterrupted sequences of names written in black, while on the coast of Liguria or in the Adriatic one can find two or more red ink names one after the other.[184]

The conservatism that was so clearly a feature of medieval nautical charts became even more pronounced during the sixteenth and seventeenth centuries, particularly where the names of important settlements were concerned. Leghorn, which first makes its appearance in a 1426 chart by Battista Beccari,[185] continued to be indicated in black ink throughout the first half of the sixteenth century, even though it had long supplanted Porto Pisano (Pisa) in importance. Only in the second half of the century was its name given in red, though not always: in the charts of Joan Martines and Battista Agnese it continued to be indicated in black, while in the charts of Olives-Oliva the change to red seems to have become final.

On the other hand, all the charts in the period under discussion continued to use red ink to indicate Altologo and Palatia, which corresponded to the ancient Ephesus and Miletus. Both had enjoyed an economic boom under the fourteenth-century emirates (thanks to dealings with the Venetians, who established trading posts there). But they had then gone into irreversible decline when they were taken by the Ottoman Turks at the beginning of the fifteenth century, and thereafter rapidly became insignificant small towns. Nevertheless, this dramatic change in their fortunes was not reflected in the nautical charts of the Mediterranean.

Contrary to the tendency in the medieval period, at the same time as the scale of charts became larger in the sixteenth and seventeenth centuries, one sees an increase in the number of towns named along the coastlines.[186] This is clear, for example, in Jacopo Maggiolo's 1567 nautical chart of the Tyrrhenian Sea (fig. 7.16, ItRo6), which is calculated to be to a scale of around 1:1,000,000.[187] There are nearly three times as many place-names between Nice and the river Magra as are found in Jacopo's "standard" charts; then from Sarzana to Anzio, and in Sardinia, they thin considerably, even if they remain a little more numerous than usual. Along the coastlines of Corsica, the growth in the number of toponyms is even more notable, because they multiply by more than a factor of six.[188] The cartographer, therefore, seems to have concentrated on the coastal areas best known to him and served by a lot of Genoese shipping.

The regional chart of the Aegean drawn up in Portoferraio by Volcio in 1595 is another that contains almost double the number of coastal place-names as the cartographer's usual charts,[189] and the three regional charts of the Italian coast of the Tyrrhenian Sea in Giovanni Battista Cavallini's 1652 atlas (plate 6) contain three times as many place-names as the same stretch of coast depicted in the atlas's general chart of the Mediterranean.[190] Giovanni Francesco Monno seems to have followed a differ-

181. Baldacci, *Introduzione allo studio,* 57.

182. Caraci, "Cimeli cartografici sconosciuti esistenti a Firenze," 50.

183. Rosselló Verger, "Cartes i atles portolans," 19.

184. In the charts of Jacopo Maggiolo, for example, one often finds "Arbenga" (Albenga), "Fina" (Finale), and "Nori" (Noli) written in red one after the other.

185. Campbell, "Portolan Charts," 427 n. 381.

186. Campbell, "Portolan Charts," 421–22.

187. Sebastiano Crinò, "Un astuccio," 167. The chart shows only the Sea of Liguria and a large part of Tyrrhenian, and it is almost totally without decoration; however, though there is not even the large miniature of the city of Genoa that was a sort of Maggiolo trademark, there is a miniature of the city of Pisa (which could have been added at a later date).

188. From Nice to Sarzana there are seventy-seven in the large-scale chart (ItRo6) and twenty-seven in the "standard" version used for comparison (ItRo4); from Sarzana to Anzio there are thirty-eight and thirty-one; in Corsica there are ninety-one and fourteen; in Sardinia there are forty-seven and thirty-two.

189. *Arcipelago de Conpasso Largo*. See Sotheby's, *Printed Books and Maps: Comprising Greece, Turkey, the Middle East and other Subjects . . .* , 30 June 1992, 1 July 1992, and 9 July 1992 (London: Sotheby's, [1992]), 71, lot 501, today in a private collection in Greece.

190. "Teatro del Mondo Marittimo" (ItFi35).

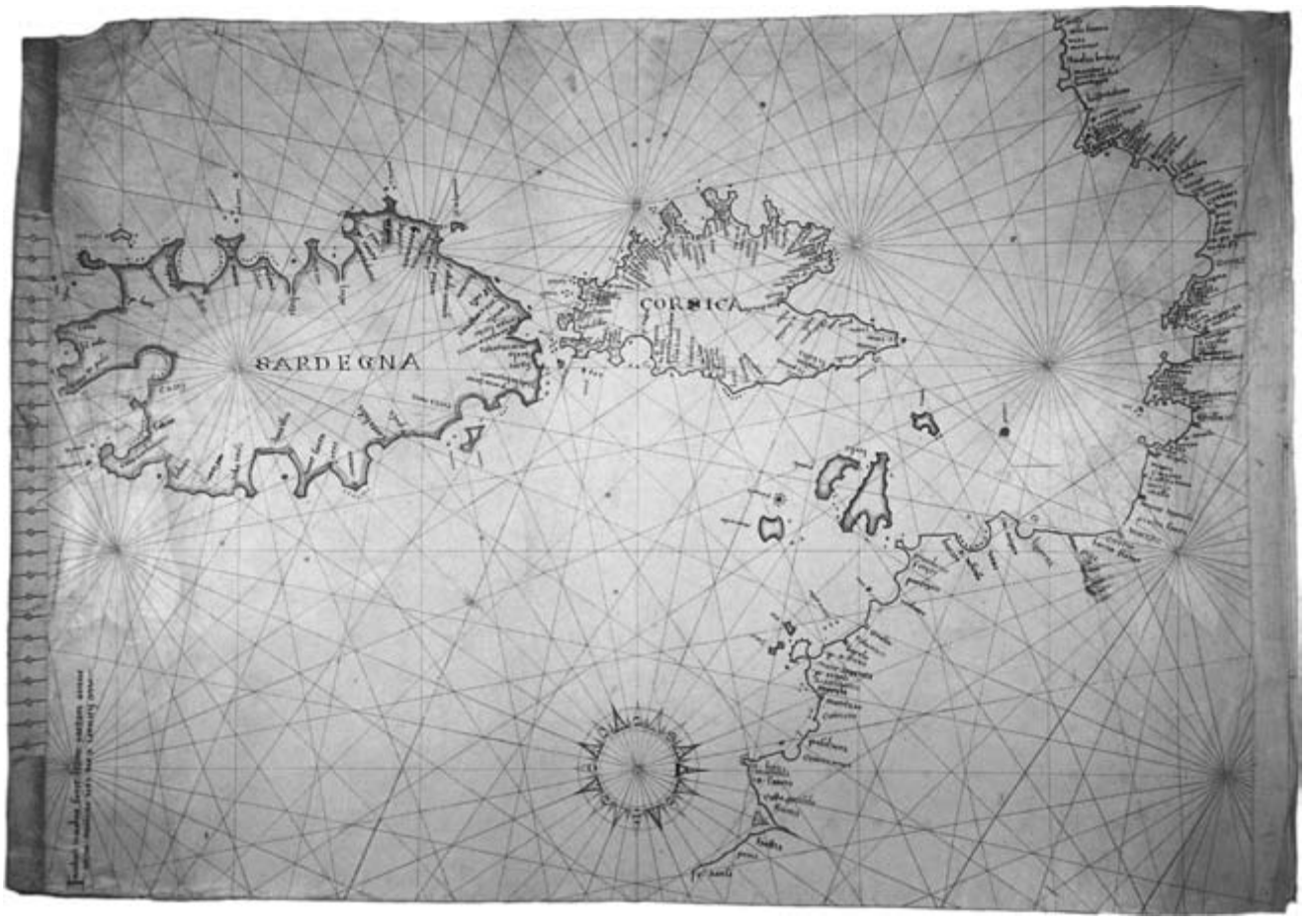

FIG. 7.16. LARGE-SCALE NAUTICAL CHART OF THE TYRRHENIAN SEA. Jacopo Maggiolo, Genoa, 1567. Size of the original: 66 × 46.9 cm. Photograph courtesy of the Biblioteca Nazionale Centrale, Rome (Nautical Charts, 5).

ent procedure: in his nautical atlas of 1632[191] the standard charts are the four that combine to cover the area of the Mediterranean,[192] while the overall chart of the Mediterranean is much smaller than usual and thus requires him to cut nearly half of the place-names.[193]

The difficulty of including all the toponymic information from a source chart within the coastline of a new chart is clear in the case of the previously mentioned nautical chart that gives all place-names in Greek characters: the amanuensis, who was probably copying from a Venetian original, may well have been rather inexperienced and did not manage to get all the names in the right position; he therefore resorted to numbers, which are then explained in legends that appear along the upper and lower borders of the chart.

It should also be pointed out that, in general, differences in scale did not affect which cities and settlements were chosen as important: the number of red ink names does not vary at all (as in the case of Jacopo Maggiolo) or only slightly (as in the case of the other three previously mentioned cartographers). One exception is to be found in the 1661 atlas by Francesco Maria Levanto, where the large-scale chart of the Mediterranean has double the number of both black ink and red ink place-names as the standard general chart.[194]

Centers of Production

In all, there were some twenty centers of production for nautical charts of the Mediterranean, but in only eight of these could one speak of one or more permanent cartographic workshops (the output in the other centers was

191. "Arte della Vera Navegatione" (ItGe3).

192. The two nautical charts of 1613 (ItRo16) and 1629 (UKL39) are at approximately the same scale.

193. One work very similar in size and scale is the 1622 chart "Cosmographia ex operibus . . ." Durazzo-Giustiniani private library, Genoa.

194. Durazzo-Giustiniani private library, Genoa.

FIG. 7.17. REFERENCE MAP OF THE MEDITERRANEAN. This map shows the places mentioned in this chapter. The eight most important centers with their own workshops in the sixteenth and seventeenth centuries were Palma de Mallorca, Genoa, Venice, Ancona, Naples, Messina, Leghorn, and Marseilles. Other places that produced charts included Barcelona, Toulon, Abisola, Porto Pisano, Siena, Portoferraio, Civitavecchia, Palermo, Malta, Candia, Alessandria, and Safad.

very slim and was probably due to the temporary presence of some cartographer who then moved elsewhere). As in the Middle Ages, the important centers were all coastal cities: the traditional ports of Palma de Mallorca, Genoa, Venice, and Ancona were joined by Naples, Messina, Leghorn, and Marseilles (which enjoyed sizeable growth during this period) (fig. 7.17).

PALMA DE MALLORCA

Majorcan cartography enjoyed its heyday in the second half of the fifteenth century, during the time of Petrus Roselli, but went into local stagnation and decline from the beginning of the sixteenth century—at the very time there was a flourishing school of Majorcan cartographers at work in southern Italy. Suffering the results of Turkish occupation of the eastern Mediterranean, the city of Barcelona had tried to establish itself as a port for shipping from the New World, but attracted only a minimal part of such trade. And from the second half of the century onward, the sea along the Catalan coast became increasingly insecure as Turkish and Barbary pirates, generally based in Algeria, raided at will. This situation turned the even more exposed Balearic Islands into what was effectively an outpost of Christianity—a situation that clearly seems to have influenced the development of cartography.

At the beginning of the century, Salvat de Pilestrina (probably of Italian origin) was at work on Majorca, producing in 1511 and 1533 two charts of the Mediterranean in Catalan style. The former, once in the collection of the Munich Wehrkreisbücherei, was destroyed in the Second World War and is known to us only through Progel's 1836 reproduction, which shows that it covered a vast area ranging from southern Scandinavia to Cape Verde.[195] The latter, on the other hand, was limited to the central and western Mediterranean and does not extend beyond Galicia and Morocco.[196]

In 1538 Bartomeu Olives was at work in Palma, producing two traditional nautical charts (ItVe1 and SpBa2)—the first known works by a member of the Olives-Oliva-Ollive family, which was of Majorcan origin (see appendix 7.2 for the Oliva and Caloiro e Oliva dynasty). However, the cartographer does not seem to have found market conditions very favorable in his native city and must have emigrated quite soon afterward: his 1552 chart does not give the site of production but does mention the cartographer's nationality ("malliorq.") (USNY9bis), which was omitted as superfluous in the first two charts actually produced "en Mallorques" but is given in all the subsequent works produced in Venice, Messina, and Palermo.

Matteo Prunes's career started around the middle of the century. Given the volume and chronology of his output,

195. BNF, Rés. Ge AA 563. See Ivan Kupčík, *Münchner Portolankarten: "Kunstmann I–XIII" und zehn weitere Portolankarten / Munich Portolan Charts: "Kunstmann I–XII" and Ten Further Portolan Charts* (Munich: Deutscher Kunstverlag, 2000), 124–29.

196. SpT1. The anonymous nautical chart ItMa1 is also attributed to Salvat de Pilestrina—though not convincingly.

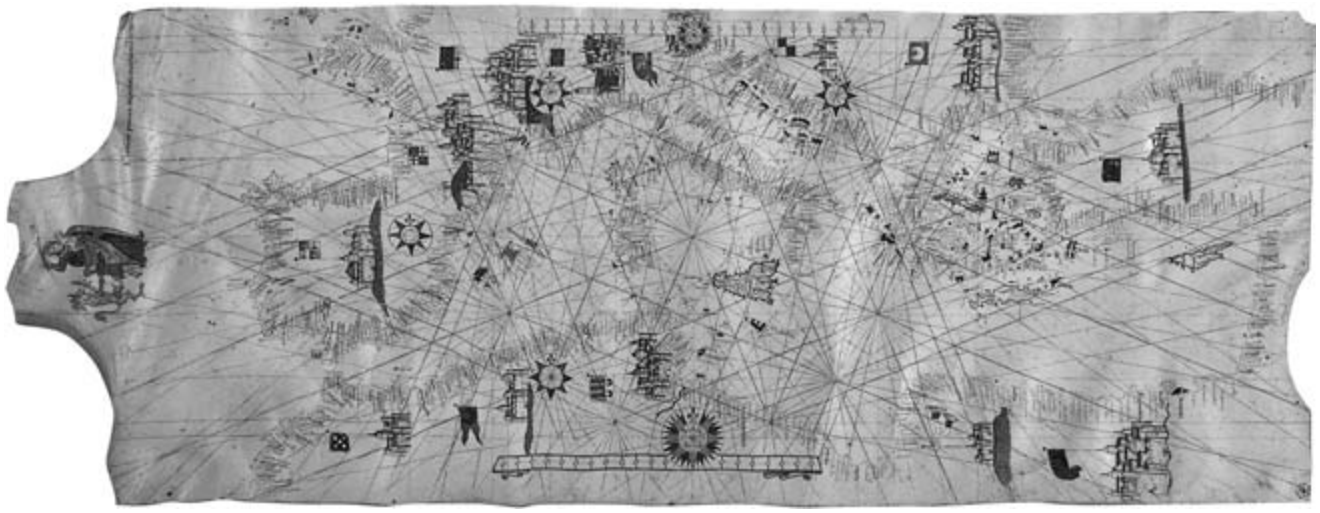

FIG. 7.18. NAUTICAL CHART OF THE MEDITERRANEAN BY MATTEO PRUNES. Palma de Mallorca, 1571. Size of the original: ca. 30.2 × 80.1 cm. Photograph courtesy of the Museo Navale di Pegli, Genoa (NIMN 4120).

he must have been at the head of a fully fledged workshop that was carried on by other members of the family. All in all, there are a dozen extant charts signed by Prunes (fig. 7.18). Rather regularly distributed over a period from 1553 to 1599, these charts are soberly decorated and are all limited to the area of the Mediterranean.[197] Baldacci, who attributes three large chart fragments (ItSs1) to Matteo Prunes, suggests that part of his output was unsigned.[198]

In 1581 Mateo Griusco was active in Palma. A cartographer we know nothing about, he has left us only one, badly damaged, chart showing the Mediterranean basin complete with a number of small city views—the largest of which is that of Venice.[199]

In 1592, toward the end of his career, Matteo Prunes produced a chart in collaboration with Reinaut Bertholomiu de Ferrieros. Having ruled out the idea that Ferrieros had simply commissioned the chart, Caraci argues that this cannot be an example of collaboration between master and pupil because Ferrieros's signature precedes that of Prunes. The precedence given seems to be intended to enhance the authority of the chart, though one fails to understand why a cartographer who had been well known for forty years should need such guarantees—especially when the chart is no different from his previous works.[200] The question is made even more mysterious by the fact that this collaboration marks Ferrieros's only appearance in the history of cartography.

Prunes signed his last chart in 1599 (ItSi3) and, given his undoubtedly advanced age, must have died soon afterward. In 1597, Vicente Prunes, whom we may suppose was Matteo's son or grandson, though we have no definite proof of this, had already produced a nautical chart in Palma (USNY17), a work that is a clear echo of the work of the older Prunes, whose workshop Vicente must have taken over. All in all, his extant output amounts to three nautical charts and an atlas of the Mediterranean in which the first double sheets contain a depiction of the western hemisphere that is at least fifty years out of date (with North America linked to northern Europe and a part of the Mar del Sur shown to the west of the mythical Isthmus of Giovanni da Verrazzano).[201]

Vicente's last dated chart is from 1601. There is then a gap of almost fifty years—that is, two generations—before the next dated work by a member of the Prunes family: that produced by Juan Bautista Prunes in Palma di Mallorca in 1649 (FrP45). The only extant works by another Prunes, Père Juan, are a three-sheet atlas produced in 1651 (ItCo2) and a signed but undated nautical chart (ItVe52).[202] Thereafter, we lose all trace of this Majorcan workshop, which we may assume continued over that almost fifty-year gap between the last work of Vicente and those of Juan Vicente and Père Juan, producing simple

197. FrP23, FrP24, ItCv1, ItFi9, ItGe11, ItSi2, ItSi3, ItVe39, ItVe40, SpM11, USW3, as well as the nautical chart once in the Biblioteca Trivulziana (Milan) but destroyed during the Second World War.

198. ItSs1. Baldacci, *La geocarta nautica,* 27.

199. ItPr6. Mario Longhena, "Atlanti e carte nautiche del secolo XIV al XVII conservati nella Biblioteca e nell'Archivio di Parma," *Archivio Storico per le Provincie Parmensi* 7 (1907): 135–78.

200. ItFi9. Caraci, "A proposito di alcune carte nautiche," 272–73.

201. ItGe13 and USNY17 as well as a chart in a private collection: Alberto Capacci and Carlo Pestarino, "Una carta nautica inedita attribuibile a Vicente Prunes," *Rivista Geografica Italiana* 91 (1984): 279–313, esp. 285–311. The atlas of the Mediterranean is SpBa6.

202. Caraci, "A proposito di alcune carte nautiche," 274–76.

nautical charts at low cost—just as did the Maggiolo workshop in Genoa.[203] However, the Prunes family monopoly was not the result of an officially granted privilege, as was the case in Genoa, but appears to have been attributable to the scarcity of demand in a crisis-ridden market. The *de facto* nature of this monopoly seems to be confirmed by the presence of Mateo Griusco, who may even have been a foreigner, and yet in the signature to his chart explicitly states that it was produced "in civitate Maioricarum" (ItPr6).

Chartmaking in Barcelona seems to have been entirely sporadic. After a long career spent working in Marseilles, Messina, Naples, and again in Marseilles, the presumably aged Majorcan cartographer Jaume Olives moved there to produce what would be his last works: a chart dated 1571 (SpP4) and a nine-sheet atlas dated 1572 (FrV1).

We also know that at the very end of the sixteenth and the beginning of the seventeenth century Gerolamo Costo of Sestri Ponente was at work in Barcelona. The chart he produced (ItGe14) is now missing the fragment that bore the year but must date from before 1605, when Costo became official cartographer to the Republic of Genoa and took up residence in that city.

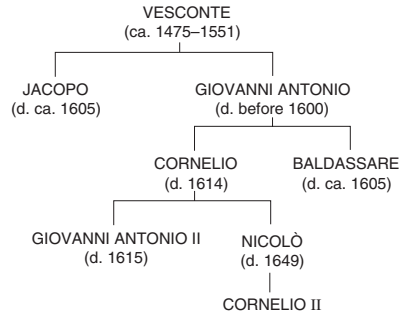

FIG. 7.19. THE MAGGIOLO FAMILY OF CARTOGRAPHERS.

GENOA

Nautical cartography can hardly have flourished in fifteenth-century Genoa if in 1448 Agostino da Noli was granted exemption from certain taxes and duties because he was the only one in the city engaged in this activity. For the second half of the century, the only recorded names of cartographers are those of Bartolomeo Pareto and Albino Canepa, along with Grazioso Benincasa from Ancona, who is known to have been active in Genoa for about two years.[204]

Probably it was this market situation that in the following century favored the emergence of a system that was halfway between that applying in Spain and Portugal (where chartmaking was the province of state organizations) and that prevailing in the other main ports of the Mediterranean (where charts were produced in private, often family-run, workshops). In Genoa, in fact, chartmaking remained a private enterprise but under a state-controlled monopoly; the result was that for about 150 years the only cartographers in the city were the Maggiolo family (fig. 7.19).

The founder of this veritable dynasty of cartographers was Vesconte Maggiolo, born in Genoa to Jacopo Maggiolo and Mariola de Salvo, probably around 1475.[205] Nothing is known of his apprenticeship, which may have been passed in a Genoese workshop of which all trace has been lost. His earliest extant work is probably the large world chart produced in Genoa, perhaps sometime around 1504 (ItFa1).[206] Thereafter, we know that by 1511 the cartographer was successfully at work in Naples. However, after taking Neapolitan citizenship and marrying a local woman, he moved back to Genoa around 1518: Spotorno gives Doge Ottaviano Fregoso the credit for having recalled to the city "excellent minds," including "a certain . . . Visconte Maggiolo, famed for his skill

203. We also know of two loose sheets from an atlas that are signed by Michel Prunes but bear no date or indication of place of production (SpP9).

204. We also have the large world chart (FrP2) based on a Portuguese model and drawn up at the very beginning of the sixteenth century. It is signed by one Nicolò de Caverio of Genoa, who is otherwise unknown to us. However, there is no certain proof for the generally held belief that the work was actually produced in Genoa.

205. The exact date of his birth is not known. However, given that the division of the father's estate took place in 1476, he must have been born before that date, but not much before, as he signed his last work in 1549 (Ferretto, "I cartografi"). All in all, we know of twenty-six works signed by Vesconte Maggiolo. These include the 1527 world chart and the 1524 chart once in the Bibioteca Ambrosiana, Milan—both destroyed by bombs in the Second World War. One can also add the anonymous chart USNH2; however, serious doubts remain about the attribution of the atlas UKL7. Corradino Astengo, "Der genuesische Kartograph Vesconte Maggiolo und sein Werk," *Cartographica Helvetica* 13 (1996): 9–17.

206. The inscription reads "ego vesconte de maiollo conpoxuy . anc Cartam de anno dominj .1 5 4. die . VIII Juny in civitatem Janua." Two small abrasions between the three numbers indicating the year suggest it must originally have read ".1.5.4." However, this is not enough to resolve the debate between scholars over the dating. Sebastiano Crinò, "Notizia sopra una carta da navigare di Visconte Maggiolo che si conserva nella Biblioteca Federiciana di Fano," *Bollettino della Società Geografica Italiana* 44 (1907): 1114–21; Roberto Levillier, "Il Maiollo di Fano alla Mostra Vespucciana," *L'Universo* 34 (1954): 956–66; idem, "O planisfério de Maiollo de 1504: Nova prova do itinerário de Gonçalo Coelho-Vespúcio, à Patagônia, em sua viagem de 1501–1502," *Revista de História* 7, no. 26 (1956): 431–40; Giuseppe Caraci, "Sulla data del Planisfero di Vesconte Maggiolo conservato a Fano," *Memorie Geografiche* 3 (1956): 109–28; idem, "Amerigo Vespucci, Gonzalo Coelho e il Planisfero di Fano," *Memorie Geografiche* 3 (1956): 129–56; idem, "La produzione cartografica di Vesconte Maggiolo (1511–1549) e il Nuovo Mondo," *Memorie Geografiche* 4 (1958): 221–89; idem, "Ancora sulla data del Planisfero di Fano," *Memorie Geografiche* 6 (1960): 89–126; Guglielmo Cavallo,

in drawing up geographical maps and nautical charts."[207] In 1519, Vesconte was appointed *magister cartarum pro navigando* (official cartographer to the Republic); on top of any privately earned income, he was to receive a stipend of one hundred lire a year with the one condition that he continue to live in the city and work exclusively for Genoese interests.

A chart of 1525 bears the signatures of both Vesconte and Giovanni Antonio Maggiolo (ItPr3), who was probably the cartographer's eldest son and yet still a very young apprentice. The aim was clearly to present the young man as fit to succeed his father, as duly happened four years later when in a ruling of 16 April 1529 the Senate extended the privileges of Vesconte's monopoly to include his sons Jacopo and Giovanni Antonio (or only one thereof, should the other opt for a different profession).[208]

A few years later—perhaps thanks to sums raised by the sale of family property in Rapallo and the undoubtedly modest income from his work as a cartographer—Vesconte bought a house in the Molo district, a busy area where a number of artisans connected with shipping activities—sailmakers, oarmakers, ironsmiths, and coopers—had their homes and workshops. In this period Vesconte Maggiolo produced not only nautical charts of the Mediterranean but also two large world charts depicting the entire world as it was known after the voyages of Ferdinand Magellan and Giovanni da Verrazzano.[209] Given the amount of time that must have been required to draw and decorate these works, they cannot have earned a great deal of money for their author, who therefore considered exploiting the opportunities offered by the new technique of printing. Hence, on 11 April 1534 in the presence of the notary Bernardo Usodimare Granello, a contract was drawn up committing "Magister Vesconte, once called Jacob, a master chartmaker" to the production of "a world map or a navigation chart containing the whole world" for "Laurentius Lomelinus Sorba notarius," a well-known printer who in his turn undertook to "to have engraved woodblocks done." This project for a world chart consisting of a number of printed sheets glued onto canvas did not, however, come to anything. We can only surmise that the cartographer intended to base his work on the world charts of 1527 and 1531.[210]

In 1544 Vesconte's son Jacopo obtained an annual salary of one hundred lire from the Senate in exchange for his undertaking to practice within Genoa the art learned in his father's workshop. However, the older man continued to produce charts, and among his later works one that merits special attention is the 1548 chart of the Mediterranean (UKGr2), which is crammed with decorative features such a coats of arms, flags, real and imaginary animals, ships, sovereigns, and multicolored tents. It has been pointed out that some of these features seem to have been printed on the chart and then colored in[211]—a sure sign that the workshop was trying to cut costs.

The last extant work by Vesconte is a small four-sheet atlas that is dated as completed on 10 December 1549.[212] We do not know when he died, but it must have been before 19 March 1551, when in the inscription to a nautical chart his son Jacopo declares himself "*condam* [*sic* for *quondam*] *Vesconti*."[213] That is the first extant work signed by Jacopo. It is bound, together with three anonymous charts of the Mediterranean and a chart of the Americas dated 1592 and signed Thomas Hood, in the previously mentioned volume of manuscript charts prepared by Robert Dudley for his *Arcano del mare*.

As an official cartographer to the Republic, Jacopo limited himself to the area of the Mediterranean—and his charts are generally adorned with the same decorative motifs as those used by his father—but showed no interest in the production of atlases or world charts. The one exception is a 1561 chart (plate 7) that extends as far north as Scandinavia, as far south as the Gulf of Guinea, and as far west as the Azores (ItGe9). The white space left in the area of the Sahara by the omission of the mountain range of the Carena (which had previously been erroneously added) is filled by a small world chart, for which the cartographer used various sources and not just his father's work.

Jacopo seems to have been at work up to 1573, the year of a rather sober chart without any of the usual decorative features (FrP17). Then, before he produced his last extant work, which bears the date 1602 (ItMi2), there is an inexplicable twenty-nine year gap. However, there are signs of abrasion around the numbers of the later date, so

ed., *Cristoforo Colombo e l'apertura degli spazi: Mostra storico-cartografica,* 2 vols. (Rome: Istituto Poligrafico e Zecca dello Stato, Libreria dello Stato, 1992), 2:643–47; and Astengo, "Der genuesische Kartograph."

207. Giovanni Battista Spotorno, *Storia letteraria della Liguria,* 5 vols. (Bologna: Forni, 1972), 4:282–83.

208. Ferretto, "I cartografi," 68.

209. The former, dated 1527, was in the Biblioteca Ambrosiana, Milan, but was destroyed in the Second World War; the latter, much less well known because it is in a private collection, dates from 1531.

210. After arguing that the Fano world chart dated from 1534, Crinò claimed it must be the world chart that was produced for Lorenzo Lomellino (Crinò, "Notizia," 1121). Apart from the question of the date, the work was actually obsolete relative to the state of geographical knowledge in 1535. On the contract, see George H. Beans, "Some Notes from the Tall Tree Library," *Imago Mundi* 7 (1950): 89–92, esp. 89.

211. Campbell, "Portolan Charts," 391 n. 189.

212. ItTr1. The chart sold at auction by Beussant-Lefèvre (on 29 November 1990) is probably of the same year—but the date has clearly been changed.

213. GeM3. Ferretto, "I cartografi," 70, and Corradino Astengo, "I discendenti di Vesconte Maggiolo: Una dinastia di cartografi a Genova," *Annali di Ricerche e Studi di Geografia* 47 (1991): 59–71.

it may have been altered. This could be evidence that the aged Jacopo was no longer able to work and falsified a date so as to demonstrate the contrary, and thus go on receiving his annual stipend of one hundred lire (which was in fact last paid in his name in the year 1605).

Up to the last quarter of the sixteenth century, the monopoly exercised by the Maggiolo family forced other Genoese cartographers to look elsewhere for work,[214] but by the end of the century, perhaps due to the advanced age of Jacopo, the monopoly seems to have been less watertight: there were not only two members of the Maggiolo at work in the city, but also Carlo da Corte, author of a chart dated 1592 (USCh8).

Just when Jacopo's professional output started to thin out, his elder brother Giovanni Antonio,[215] perhaps after a period in which he dedicated himself to other activities, drew up three nautical charts in 1565, 1575, and 1578 respectively. The place of production is not given on any of these charts, so it could have been other than Genoa. However, one might explain this return to cartography as Giovanni Antonio's attempt to secure the appointment of one of his sons as Jacopo's successor in the post of official cartographer—though of course this remains nothing more than a conjecture.

What is certain is that in the years immediately afterward, Giovanni Antonio's son, Baldassare, did produce charts, works that are very similar to those of his father, who favored a more sober style than did Vesconte and Jacopo. In general, the decorative features in Baldassare's work are reduced to a few coats of arms and a few miniature vignettes of coastal cities, while the large Arabian-style pavilions and inland cities disappear altogether. Similarly, the son's signature is very similar to the father's, with a long flourish in the "M" of the word "Maiolo"—always placed at the beginning of the second line—which runs up to the "C" of "Carta"—always placed at the beginning of the first line.

The death of Giovanni Antonio must have occurred before 1600, when Baldassare begins signing himself "Quondam Giovanni Antonio." The son's last work dates from 1605, and he must have died that same year—perhaps not long after his aged uncle Jacopo, who drew his annual salary for the last time in 1605. For the vacant post of official cartographer, Cornelio Maggiolo was not even considered, perhaps because he was thought too inexperienced, and the appointment went to Gerolamo Costo of Sestri Ponente, who held it until his death in 1607.[216]

At this point the city patrician Antonio Canevari recommended that the Senate appoint Cornelio Maggiolo, who had learned the art of cartography from his father and uncle, reaching a level that had enabled him to replace the incapacitated uncle and produce works "used by all Genoese sailors, but also by Florentines, Romans, French, Savoyards, and other nations."[217] However, the suggestion was rejected because the Magistrato delle Galee (Magistrature of Shipping) did not give an opinion on Cornelio's abilities.[218]

The application was re-presented in 1611, this time successfully: the shipping authority observed that "at present one cannot find anyone, except Cornelio, who makes navigation charts,"[219] and so the Senate voted accordingly. Clearly, during this four-year interval Cornelio had gone on producing charts as a private cartographer, now signing his works with his own name.

There seems no doubt that during the later years of Jacopo's life, when the workshop was effectively being run by Cornelio, the official output of the *magister* was limited almost exclusively to navigation charts proper, totally without ornamentation and designed for use on board ship. It also seems that the market for such charts must have been quite healthy, given Cornelio's eagerness to obtain the official appointment. None of the works by him or his successors has come down to us, and hence we can assume that there was no longer a market in Genoa for luxury charts destined for library use.

During the course of the sixteenth century the city had changed: the fall of Chios in 1566 meant that Genoa had lost the last of its outposts for trade with the East, and thereafter trading colonies were replaced by financial colonies established in Spain, Milan, Venice, and numerous other cities. The fleet was reduced in size, and the city's merchants became bankers, with very little interest in the sea and nautical charts. Money and power were concentrated in the hands of only a few families, who preferred to invest their money in the purchase of land in Montferrat and the Po Valley.

A document of 1612 reveals that Cornelio was still living in the house in the Molo district and, together with

214. Battista Agnese, for example, may have always declared himself *Januensis,* but he seems to have worked exclusively in Venice, while Jacopo Scotto produced charts in Civitavecchia and Naples.

215. The question is complicated by the fact that Jacopo had a son who was also called Giovanni Antonio; but he died at an early age, leaving his father without male heirs. What is more, the cartographer declares himself to be *quondam Visconte,* and so could only have been Jacopo's brother.

216. His only extant work bears an illegible date, but was produced in Barcelona (ItGe14), that is, it was produced before his appointment (given that the *magister* was required to reside in Genoa).

217. Giuseppe Caraci, "A proposito dei cartografi Maggiolo," *Rivista Marittima* 64 (1931): 236–38, esp. 237.

218. According to Caraci, this proves that the younger man never signed the works he produced in Jacopo's workshop, which continued to be sold under the signature—real or apocryphal—of the appointed *magister.* Caraci, "A proposito dei cartografi Maggiolo," 237–38.

219. Cornelio Desimoni, "Nuovi documenti riguardanti i cartografi Maggiolo," *Giornale Ligustico di Archeologia, Storia e Belle Arti* 4 (1877): 81–88, esp. 84.

his two sons, was engaged in the production of navigation charts, compasses, and other nautical instruments. Two years later he died, and in 1615 his place was taken by his eldest son, Giovanni Antonio, who received a reduced stipend of fifty lire a year. Six months after his appointment he was murdered, and his position was taken by his brother Nicolò, only nineteen at the time.

The thirty-two years in which Nicolò ran the workshop cannot have been very prosperous if in 1644 he had to petition the Senate for a stricter application of his monopoly in order to prevent "foreign persons" from making or repairing navigational charts, compasses, and hourglasses.[220] Just who these "foreign persons" were whom Nicolò looked upon as unfair competition is difficult to tell. It is unlikely that they included Giovanni Francesco Monno, active between 1613 and 1642, who produced portolans, navigational treatises, and nautical charts.[221] Very little is known about this figure, who claimed to be from Monaco and defined himself as a surgeon.[222] Such a lowly profession, in the early modern period, is in stark contrast with the erudition Monno often flaunts in his works, and with the precision and elegance of his products—all of which seem to have been intended for important clients (for example, Monno's "Arte della Vera Navegatione," a portolan, nautical atlas, and navigational treatise all in one, was dedicated to Onorato II Grimaldi and was clearly designed to teach the secrets of the art of navigation to a person of such rank). The income of the Maggiolo workshop, which produced much more modest objects, could not have been threatened by the work of Monno.

The same could be said of Alberto de Stefano, a navigator who produced two works in Genoa, a large nautical chart of six sheets glued onto canvas (UKGr20) and a small fourteen-sheet atlas (UKL45), in the years 1644 and 1645 respectively. Neither work could possibly have been designed for use on board ship.

Whatever the truth, when Nicolò died in 1649, his son Cornelio applied unsuccessfully to be appointed in his place. Payments for a *magister cartarum pro navigando* (master of charts for navigation) ceased after that year. Clearly, with the advent of printed charts the Republic of Genoa felt such a figure had become unnecessary.

In the years 1661–62 Captain Francesco Maria Levanto drew up some nautical charts of the Mediterranean, which were later bound together in a single volume.[223] These sheets anticipate his *Specchio del Mare,* published in Genoa in 1664,[224] which, like Monno's "Arte della Vera Navegatione," was a *portolano,* nautical atlas, and navigational treatise all in one. The lack of success of the later work[225] may be due to its lack of originality, given that it was entirely dependent on similar Dutch publications, particularly Anthonie Jacobsz.'s *Niew groot Stratesboeck,* printed in Amsterdam in 1648.

The final figure in a local craft on the verge of extinction was another sailor, Guglielmo Saetone of Albisola, who produced a manuscript *portolano* of the Mediterranean that contains five rather basic nautical charts. His "Stella guidante di pilotti e marinari," known in two copies, is dedicated to Admiral Ippolito Centurione, and it is not unlikely that Saetone served as a commander on one of his ships.[226] The volumes were produced between 1681 and 1683, when Saetone was more than sixty years old, and the more carefully worked of the two was probably intended for the admiral himself (ItMi5), while the other undoubtedly remained in Saetone's personal possession (ItA1). Produced in old age by a very experienced sailor, this work may have had a practical intent, but it looks more like a visual diary conjuring up memories of long-past personal adventures and the places associated with them.

VENICE

The situation in Venice was very different, given that throughout the sixteenth century the Venetian Republic managed to maintain its trade routes in spite of the expansion of the Ottoman empire. True, it had lost its monopoly on trade with Alexandria and had abandoned the system of renting out a state fleet of galleys to private merchants (as a form of public subsidy to trade), yet the port continued to flourish throughout the century and attracted a large number of foreign technicians, including cartographers.[227]

From the middle of the fifteenth century onward, the Republic had instituted a number of magistratures or public offices whose authorities made wide use of maps in

220. Ferretto, "I cartografi Maggiolo," 80–81.

221. ItGe3, ItRo16, and UKL39, as well as the chart in the Durazzo-Giustiniani private library, Genoa, and the copy of "Arte della Vera Navegatione" once in the Bibioteca dello Stato Maggiore della Marina, Rome, but now of unknown whereabouts.

222. Giuseppe Andriani, "La Liguria nel 'Portolano' di Giov. Francesco Monno (1633)," *Atti della Società Ligustica di Scienze Naturali e Geografiche* 27 (1916): 71–116.

223. Durazzo-Giustiniani private library, Genoa.

224. Dedicated to Gio. Battista Della Rovere, the work was printed by Gerolamo Marino and Benedetto Celle and was available for sale at the author's workshop in Piazza Banchi.

225. However, Vincenzo Coronelli did include it in the 1698 *Atlante Veneto.*

226. Elena Strada, "Di due sconosciuti atlanti nautici manoscritti di Guglielmo Saetone," in *Atti del XV Congresso Geografico Italiano, Torino 11–16 aprile 1950,* 2 vols. (Turin: Industrie tipografico–Editrici Riunite, 1952), 2:787–90.

227. Jean Claude Hocquet, "Les routes maritimes du commerce vénitien aux XV^{e} et XVI^{e} siècles," *Atti del V Convegno Internazionale di Studi Colombiani "Navi e Navigazione nei Secoli XV e XVI" Genova, 26–28 ottobre 1987* (Genoa: Civico Istituto Colombiano, 1990), 579–605.

the exercise of territorial control. However, there never seems to have been a state workshop for the production of nautical charts, nor did Venice adopt the Genoese system of relying on a private workshop subject to state control. Nevertheless, numerous cartographers must have been at work in the city, as one can see from the extent of their output for the whole of the sixteenth century.[228] Cartography in Venice does not seem to have been a family business as it was in other Mediterranean centers of chartmaking, and there are no known dynasties of cartographers based on the transmission of knowledge from one generation to another. This may be partly due to the fact that, during the two centuries under study, almost all Venetian cartographers were foreigners, attracted by the possibilities of earning wages in a market that was totally free and lacked monopolies or controls. This naturally suggests that the situation was less clear-cut than elsewhere, with more coming and going and greater openness toward the foreign and the new.

Possible clients would undoubtedly have included the city's wealthy merchants, who no longer faced the perils of the sea in person,[229] but, like Shakespeare's Solanio,[230] would have wanted to be able to follow the course of their merchandise as it made its way to distant seas. The charts may also have been tools of learning for those Venetian patricians who were obliged to take to the sea and participate in the Republic's interminable war against piracy. But perhaps the interest in nautical charts and atlases can simply be explained by what Tenenti calls "the sense of the sea," that constant presence of the sea in Venetian art, literature, and day-to-day life.[231] What is more, the market for these elegant objects would have been further swelled by the fact that Venice was beginning to establish itself as the main destination for travelers to Italy, attracting numerous rich foreigners eager to enjoy the city's artistic wealth and cultural vivacity. Hence, throughout the sixteenth century Venice was an outward-looking city, a center of trade that also gathered in news and ideas and was quick to welcome talent from other parts of the Mediterranean.

Foremost among these talented outsiders one would have to include Battista Agnese, who was a native of Genoa—as he always declared in his signature on his charts—but worked in Venice from the beginning of his very long career. What is strange is that practically nothing is known of the man whose personality and output dominated the cartography of the sixteenth century; and what little we do know has to be deduced directly from the works themselves. Harrisse, who called Agnese a "very artistic cartographer," identified some thirty-nine works produced over the period 1536–64; Kretschmer subsequently increased the number of atlases to fifty-four and gave 1527 as the start of Agnese's career, basing the date on mention of an atlas of that year—reported by Canale, Uzielli and Amat di S. Filippo, and Nordenskiöld—that subsequently proved to be unfounded.[232]

In 1928 Caraci drew attention to a chart bearing the inscription "Baptista Januensis f. Venetiis MCCCCCXIV [F] Julii" (GeW1), which he did not hesitate to attribute to Agnese and thus date the start of his career as early as 1514.[233] In response to the objection that this meant there was a long and apparently inexplicable gap between the first known chart and the first atlas, he pointed out that a lot of extant Agnese works were undated and also that at the beginning of his career the cartographer, a recent immigrant to Venice, would certainly not have had a large workshop at his disposal and presumably had to work on a very limited scale. However, in his fundamental study of Agnese atlases, Wagner does not even mention the first chart and gives the atlas of 1536 as the cartographer's first work (UKL11); though he does admit some undated work might be slightly earlier.[234] Crone also rejects the attribution of the 1514 chart to Agnese—both because of the resultant gap between it and the next known work and because it would extend the cartographer's working life to all of fifty years.[235] Finally, Almagià confirmed Caraci's attribution, claiming that the key features of coastline and place-names were undoubtedly Agnese's, and therefore the work was a very early one.[236] As for the seeming fifty-year career, he pointed out that the workshop probably continued to turn out charts and atlases after the death of Agnese himself.

228. Ugo Tucci, "La carta nautica," in *Carte da navigar,* 9–19, and Emanuela Casti [Moreschi], "Cartografia e politica territoriale nella Repubblica di Venezia (secoli XIV–XVIII)," in *La cartografia italiana* (Barcelona: Institut Cartogràfic de Catalunya, 1993), 79–101.

229. Casti [Moreschi], "Cartografia e politica," 85.

230. "Salanio: Believe me, sir, had I such venture forth / The better part of my affections would / Be with my hopes abroad. I should be still / Plucking the grass to know where sits the wind, / Peering in maps for ports and piers and roads." William Shakespeare, *The Merchant of Venice,* act 1, sc. 1, ll. 15–19; see *The Norton Shakespeare,* ed. Stephen Greenblatt et al. (New York: W. W. Norton, 1997), 1091.

231. Tenenti, "Il senso del mare."

232. Henry Harrisse, *The Discovery of North America: A Critical, Documentary, and Historic Investigation, with an Essay on the Early Cartography of the New World, Including Descriptions of Two Hundred and Fifty Maps or Globes Existing or Lost, Constructed before the Year 1536* (London: Henry Stevens and Son, 1892), 626–30, esp. 626; Konrad Kretschmer, "Die Atlanten des Battista Agnese," *Zeitschrift der Gesellschaft für Erdkunde zu Berlin* 31 (1896): 362–68; Michel-Giuseppe Canale, *Storia del commercio, dei viaggi, delle scoperte e carte nautiche degl' italiani* (Genoa: Spese, 1866), 473; Uzielli and Amat di S. Filippo, *Mappamondi,* 113; and Nordenskiöld, *Periplus,* 65.

233. Giuseppe Caraci, "Di due carte di Battista Agnese," *Rivista Geografica Italiana* 35 (1928): 227–34.

234. Wagner, "Manuscript Atlases."

235. G. R. Crone, "A Manuscript Atlas by Battista Agnese in the Society's Collection," *Geographical Journal* 108 (1946): 72–80, esp. 78.

236. Roberto Almagià, "Una carta del 1514 attribuita a Battista Agnese," *Rivista Geografica Italiana* 56 (1949): 167–68.

Wagner listed sixty-eight atlases—four of which were considered of dubious attribution—and in 1947 added another three.[237] Since then, other atlases have come to light.[238] Wagner had briefly mentioned only two traditional nautical charts,[239] to which one should add the above-mentioned work (GeW1) and six other anonymous charts that can be attributed to Agnese with some degree of certainty.[240]

Such a vast output poses serious problems of classification. Kretschmer tried to classify the atlases into three groups on the basis of the size of the sheets, but the result was hardly convincing. Wagner, after rejecting a purely chronological division (because so many works are undated), also rejected Kretschmer's criterion and one based on the number of sheets in each atlas. He finally opted for the geographical features of the atlases as criteria for classification, thus dividing the works on the basis of a sort of natural development due to the progress being made in world exploration. Wagner himself recognized that these criteria are not fully satisfactory because Agnese sometimes returned to geographical notions he had previously abandoned (for example, the presentation of Yucatan as an island).[241]

The indicators Wagner chose were the appearance of the peninsula of California and the new outline of Scotland, no longer shown as separate from England. As a result of these, the atlases could be divided into three large groups: Type 1—pre-Californian, from ca. 1535 to the end of 1541; Type 2—post-Californian, from ca. 1542 to 1552; Type 3—Post-Californian, with a new map of Scotland, from ca. 1552 to 1564. These three large groups are then spilt into lettered subdivisions, again based on changing geographical representations, and thus provide a full and complete classification of Agnese's work.

Almost one-third of the atlases follow an identical sequence, which make it possible to speak of "the Battista Agnese standard atlas" or a *Grundversion*.[242] Generally, the first sheet is occupied by an elaborate piece of scrollwork with an internal oval space that is either blank or already contains the coat of arms of the person who commissioned or bought the atlas. This is followed by an armillary sphere, a zodiac calendar (often containing a representation of the Aristotelian-Ptolemaic system), and a table of solar declinations. Thereafter come three nautical charts of the oceans forming a complete nautical world chart, six charts of the area of the Mediterranean, and a world map in oval projection with equidistant parallels showing the route taken by Magellan (a detail that is a veritable trademark of all Agnese's work).[243]

In 1542 an Atlantic hemisphere is added, normally without degrees of latitude or place-names. Then from 1545 onward the atlases began to include not only a nautical chart of Italy and the Adriatic, but also a series of what Wagner calls "land maps," or rather "land maps in portolan style"; these do not have dense series of coastal place-names but show details of inland areas (generally entirely colored in with green or yellow) while maintaining a characteristic feature of nautical charts: the system of wind lines. The countries depicted are Italy and Dalmatia, Scandinavia, the Holy Land, Russia and Tartary, and Spain, while the map of Piedmont and Liguria can be considered a land map pure and simple, given that it does not contain wind lines. To these might sometimes be added a historical map showing the world as known to Ptolemy, and later would come the nautical–land maps of the main islands of the Mediterranean: Cyprus, Crete, Euboea, Lesbos, Chios, Rhodes, Malta, and Corsica, to-

237. Wagner, "Manuscript Atlases" (the four dubious atlases could have been produced by assistants after the death of the master cartographer), and Henry Raup Wagner, "Additions to the Manuscript Atlases of Battista Agnese," *Imago Mundi* 4 (1947): 28–30.

238. Among which one should mention the Ambraser Atlas, AW1 (Otto Mazal, ed., *Ambraser Atlas,* intro. Lelio Pagani [Bergamo: Grafica Gutenberg, 1980]); the atlas in Bergamo, ItBe1 (Ferro, "L'Atlante manoscritto della scuola di Battista Agnese," 501–20); that formerly owned by Estelle Doheny (Christie, Manson and Woods International, Inc., *The Estelle Doheny Collection . . . Part II: Medieval and Renaissance Manuscripts* [2 December 1987] [New York: Christie, Manson and Woods International, 1987], 111–14, which is signed and dated 5 February 1544 and appears to have been purchased in 1546 by Maximilian of Burgundy); the anonymous atlas formerly owned by the Getty Museum (Sotheby's, *Sammlung Ludwig,* 76–81, which seems to have been given to the humanist Paolo Giovio by Tommaso Campeggio, Bishop of Feltre, on 8 August 1541); that in Zurich, SwZ1 (Ernst Gagliardi, *Katalog der Handschriften der Zentralbibliothek Zürich,* 2 vols. [Zurich, 1931], 2:358–59); and that in St. Petersburg, RP1 (Tamara P. Woronowa, "Der Portolan-Atlas des Battista Agnese von 1546 in der Russischen Nationalbibliothek von Sankt Petersburg," *Cartographica Helvetica* 8 [1993]: 23–31).

239. ItCt1 and Biblioteca Crespi, Milan.

240. ItPr1 (Caraci, "Di due carte," 233–34, and idem, "La carta nautica del R. Archivio di Stato in Parma"); ItTs1 (Giuseppe Caraci, "Cimeli cartografici esistenti a Trieste," *Archeografo Triestino* 14 [1928]: 161–74, which in fact Caraci does not directly attribute to Agnese, but points out that the chart is very close to a model used by the cartographer); and also GeG1, FrP8, FrP9, and FrP10 (see Myriem Foncin, Marcel Destombes, and Monique de La Roncière, *Catalogue des cartes nautiques sur Vélin: Conservées au Département des Cartes et Plans* [Paris: Bibliothèque Nationale, 1963], 53–56). In addition, the large anonymous nautical world chart V2 reveals remarkable similarities with the three charts of the oceans in Agnese's atlases, so they could well be attributed to him.

241. Kretschmer, "Die Atlanten," 367, and Wagner, "Manuscript Atlases," 46–50. One can see this by comparing the atlas dated 5 February 1544 (GeD1), in which the Yucatan is shown as a peninsula, with that of 1 September 1543 (ItVe29), in which once again it is shown as an island.

242. "Agnese, Battista," in *Lexikon zur Geschichte der Kartographie,* 2 vols., ed. Ingrid Kretschmer, Johannes Dörflinger, and Franz Wawrik (Vienna: F. Deuticke, 1986), 1:5–6, esp. 5; Woronowa, "Der Portolan-Atlas"; and idem, *Der Portolan-Atlas des Battista Agnese.*

243. Magnaghi, "L'Atlante manoscritto," 145–46, and "Agnese, Battista," in *Enciclopedia Italiana di Scienze, Lettere ed Arti,* 36 vols. (Rome: Istituto Giovanni Treccani, 1929–39), 1:898–99.

gether with one of the peninsula of the Peloponnesus. Those of the British Isles, Tuscany, northern Egypt, and France are purely land maps, as are the maps of Africa and of various parts of the New World. These latter maps usually give not only latitude (shown in the left and right margin of the map) but also the equator and degrees of longitude (at the bottom and top), and, given that the cartographer has taken into account the varying lengths of longitude at different latitudes, it seems clear that he derived these maps not from nautical charts but from a printed map in globular or trapezoidal projection.[244]

There are also maps that appear only once: for example, those of the northern and southern hemispheres in polar projection that can be found in the atlas dated 1 July 1544 (SpM2) or the land map of Italy in the Bergamo Atlas, which is based on a very different prototype than that of the nautical–land maps of Italy and Dalmatia to be found in the other atlases.

Finally, there are the quite exceptional cases in which entire sheets have been given over to veritable pictures, intended to further adorn a work clearly intended for some high-ranking client. Examples of these illustrations are the picture of Atlas holding the world (in the atlas that belonged to Charles V), the portrait of a young man receiving the earthly globe from God (in the atlas Charles V gave to his son Philip II), and two mythological scenes plus the curious depiction of two Atlases together—one holding the globe while the other measures it (these latter scenes are the work of some unknown artist clearly inspired by the style of Italian mannerism).[245]

According to Wagner, Agnese drew on various sources in his work of compilation: for the three charts of his nautical world chart it is argued that he used a *padrón real* produced by the Casa de la Contratación (similar to those of Ribeiro); for his oval world map, the world map in Benedetto Bordone's *isolario* and the *tabulae novae* in the printed editions of Ptolemy's *Geography;* and for his nautical land maps, various printed chorographical maps—most of them published in Venice.[246]

Even though not explicitly documented, Agnese's links with Giovanni Battista Ramusio and Giacomo Gastaldi are clear, even if strictly one-way: Agnese borrowed without contributing anything new.[247] But, as Magnaghi points out, contemporary cartographers did not consider his work of any scientific interest, and his name never appears in the lists of sources for the great atlases drawn up in the last decades of the century.[248] However, that his workshop enjoyed a certain international reputation is clear from the fact that a number of his atlases have turned up in Germany, often in the libraries of castles and palaces nowhere near the sea.

Among the cartographers who were in some way linked to Agnese one should mention Francesco Ghisolfi, who is known to us by name only thanks to a sonnet in his honor on the last page of an anonymous atlas (ItFi30). This, and another ten anonymous atlases by the same hand, appear to be Ghisolfi's work.[249]

Wagner defines a group of seven atlases, including that in the Riccardiana, as "the Gisolfo Group."[250] Though echoing Agnese's work, these seven atlases differ in style, in their use of color, in their use of arabesqued frames for each sheet, and in their replacement of all the Spanish place-names—derived from the *padrón real*—with Italian equivalents.[251]

Some further information on Ghisolfi's work comes from Revelli, who attributes to him the anonymous ten-sheet atlas produced "for a personage of the princely family of the Doria."[252] The scholar emphasizes the close link between the ornamental figures in Francesco Ghisolfi's sheets and the painting of Perino del Vaga, who worked in Genoa in the service of Andrea Doria. He therefore suggests that the cartographer, a pupil of Battista Agnese, was born in Genoa and spent most of his working life there.[253]

This total of eight atlases identified by Wagner and Revelli has recently increased thanks to the attribution

244. Wagner, "Manuscript Atlases," 35.

245. Wagner, "Manuscript Atlases," 62; Malte-Brun, "Note sur un Portulan," 626; and Woronowa, *Der Portolan-Atlas des Battista Agnese,* 9.

246. Wagner, "Manuscript Atlases," 9–26 and 33–35, and Magnaghi, "L'Atlante manoscritto," 135–48.

247. Marica Milanesi, introduction to the facsimile edition of *Atlante Nautico di Battista Agnese 1553* (Venice: Marsilio, 1990), 13–17.

248. Magnaghi, "L'Atlante manoscritto," 148 n. 1.

249. One of these (FrP20) is mentioned by Henry Harrisse (*Discovery of North America,* 630), who considers it a contemporary fake of a Battista Agnese atlas. However, in another part of the same work, Harrisse reveals his awareness of the figure of Francesco Ghisolfi, listing him among those sixteenth-century cartographers who thought there was a land link between America and Asia. This information is taken from Wuttke, who, after examining the atlas in Florence, published the name of its author, whom he erroneously described as a renowned constructor of globes. See Heinrich Wuttke, "Zur Geschichte der Erdkunde in der letzten Hälfte des Mittelalters: Die Karten der seefahrenden Völker Südeuropas bis zum ersten Druck der Erdbeschreibung des Ptolemäus," *Jahresberichte des Vereins für Erdkunde zu Dresden* 2, nos. 6–7 (1870): 1–66, esp. 61.

250. Wagner, "Manuscript Atlases," 45–46 and 54. FrP20, ItFi29, ItFi30, ItNa2, MM1, USPo3, and USSM6.

251. The seven atlases are given in an appendix to the list of those by Battista Agnese, and numbered sixty-nine to seventy-five. Wagner claims that Ghisolfi's atlases follow the schema of Agnese's work exactly, with the addition of one or more world maps in different "projections" that generally show America linked to Asia, just as it appears in the printed world chart *Universale* produced by Giacomo Gastaldi in 1546.

252. ItGe2. Revelli, *Cristoforo Colombo,* 2:407–8.

253. Piersantelli suggests that Francesco Ghisolfi could have belonged to the same family as the Buscarello de' Ghisolfi who, at the end of the thirteenth century, spent many years in Persia at the court of the Argun Khan and in 1292 led a Persian embassy to Rome, Paris, and London—passing through Genoa (Piersantelli, *L'Atlante di carte marine*).

to Ghisolfi of an eight-sheet atlas (USCh18), a twelve-sheet atlas (UKO8), and a nine-sheet atlas (AW6). Hence, Ghisolfi's extant works now number eleven—all of them unsigned, undated, and with no indication of where they were produced, and therefore all attributed to the cartographer simply on the basis of Wagner's criteria of style, decoration, and sequence of plates (plus, of course, the sonnet in ItFi30).

There are difficulties when it comes to determining where Ghisolfi actually worked. If we accept that he was Agnese's pupil, he must have worked for some time in Venice, where his illustrious fellow citizen had his workshop. But if one wants to see particular significance in the presence of the Doria family crest in one atlas (ItGe2) and to emphasize the parallels between the ornamental features in many of his atlases and Genoese painting of the sixteenth century, one has to argue that at some point he returned to work in his native city. However, there is also the fact that three of his atlases undoubtedly belonged to members of the Medici family, which suggests that he may have worked in their employ in Florence itself.[254] Nevertheless, there is no unquestionable evidence for this last theory, and therefore, given Ghisolfi's clear links with Battista Agnese, I have preferred to include him among Venetian cartographers.

The most clearly distinguishing feature of Ghisolfi's work is his use of a varying number of world charts in different projections. In effect, the word is out of place here, because there is no real mathematical basis for the image; the cartographer has simply adapted his drawing of the known world to a series of different frames that reflect the possible forms of a true world chart.[255] Hence, there is a clear didactic aim in these sheets, which served to make the atlases more complete and varied, adapted to the needs of different clients. As to information content, there are no sizeable differences between the atlases of Agnese and those of Ghisolfi. The charts of the oceans and those of the area of the Mediterranean correspond fully, with some partial variations in place-names.[256]

The oldest extant Ghisolfi atlas seems to be that in Paris, which is so similar to Agnese's work as to be mistaken for a forgery. Thereafter his works begin to vary more, with the addition of world maps in different projections, with the substitution of the three ocean charts by a single nautical world chart, with the introduction of new and original ornamental motifs, and, toward the end of his career, with the appearance of a complicated zodiacal calendar.[257]

During the sixteenth century other foreign cartographers were at work in Venice. These include Giovanni Xenodocos, a native of Corfu, who is the author of an atlas dated 23 September 1520 and almost certainly produced within Venice itself (given the use of dialect place-names and the very realistic and detailed portrayal of St. Mark's Square in the miniature of the city).[258] According to Berchet, the present atlas is formed of three charts taken from a larger work.[259] This volume, perhaps incomplete, is all that remains of the cartographer's work.

There is much more extant work that can be attributed to Giorgio Sideri (Il Callapoda), who was a native of Crete, where in 1537 he produced his first known work: a six-sheet atlas (ItVe12). Even if there is no indication in any of his subsequent works of where they were produced, it is believed that sometime afterward the cartographer moved to Venice: of his ten extant works, produced between 1541 and 1565, a sizeable number are dedicated to Venetian patricians. Unlike Battista Agnese,

254. H. P. Kraus, *Mediaeval and Renaissance Manuscripts,* 111.

255. Besides the oval world chart, which is always present and in some cases complete with an indication of the route followed by Ferdinand Magellan (as were the world charts in Agnese's atlases), we also have a world map in two hemispheres and one in a hemisphere and two half-hemispheres. The most interesting are world charts in spherical segments, which are not to be found in other works of this type and therefore misled both Wuttke and then Revelli into believing that Ghisolfi actually manufactured globes (Wuttke, "Zur Geschichte," 61, and Revelli, *Cristoforo Colombo,* 2:408). In fact, here, too, there is no true mathematical basis for the work, so if one tried to fit the segments together one would have overlapping and blank spaces. What is more, Ghisolfi divided his world chart into a maximum of nine segments, while Henricus Glareanus (*D. Henrici Glareani poetæ lavreati De geographia liber vnus* [Basel, 1527]) had already shown sometime before that one needed a minimum of twelve segments to cover a sphere satisfactorily. The most common form in Ghisolfi is that of eight half-segments (it appears in five atlases), while there is also a world chart in five segments—in which the central segment covers 120 degrees, exactly double each of the other four making up two side pairs—and other world charts in six and nine segments (of 60 degrees and 40 degrees, respectively). Astengo, "Francesco Ghisolfi," 11.

256. Overall, as Wagner pointed out, the geographical information would seem to echo that in Agnese's atlases classified type 1D, which are dated around 1539–40. The scholar argues, however, that the atlas in San Marino derives from type 3 because it shows Yucatan as a peninsula (though this—and all of Ghisolfi's works—lacks a feature that Wagner himself said was characteristic of type 3 Agnese atlases—the new outline for Scotland). However, the clear analogies cannot be taken as proof of a direct pupil-master relation, especially not in the sixteenth century, when plagiarism was so common. So there seems no true basis for Wagner's dating of the works on the strength of these features, giving the Riccardiana and Providence atlases as around 1546/47, the San Marino work as slightly later, and the atlas in Mexico City as dating from before 1546 (Wagner, "Manuscript Atlases").

257. The Chicago and Vienna atlases contain an unusual zodiacal calendar that runs from the year 1580 to 1600. Hence, one can argue that it cannot have been produced many years before that first date, nor after 1584, when the introduction of the Gregorian calendar would have made it obsolete in all Catholic countries. However, this is only flimsy proof, as the geographical sheets in the atlas could have been produced some years before the calendar. Whatever the truth, the dates suggested by Wagner have to be moved forward by at least ten or fifteen years.

258. ItVe24. Susanna Biadene, "Catalogo delle opere," in *Carte da navigar,* 39–125, esp. 52–53.

259. Guglielmo Berchet, "Portolani esistenti nelle principali biblioteche di Venezia," *Giornale della Marina* 10 (1866): 1–10, esp. 1.

whose workshop, as we have seen, catered to an international clientele, Callapoda seems to have focused his attentions on local patrons.

Even though Callapoda's output includes nautical charts in a sober style, his works are usually elaborately decorated and full of details concerning inland regions, often with a complete picture of its orography and hydrography. There are also large variations in the area actually represented—ranging from the whole of Europe, Africa, the Near East, and a large part of the New World covered in one single large map to a large-scale rendering of the cartographer's native Crete in a single nautical-chorographical chart. As well as the owner's coat of arms, the atlases sometimes contain a large monogram of Christ occupying an entire sheet, and the sheets always have corner pieces decorated with a special geometrical-floral design that seems to be something of a Callapoda trademark. The nautical charts that cover the area of the Mediterranean are accompanied by a world chart and a series of nautical land maps covering the continents and (on a larger scale) some of the islands of the Mediterranean. Very carefully produced, Callapoda's works are, however, totally unoriginal, given that they are copied from various manuscript and printed sources. The world chart in the 1562 atlas (UKL19) is taken directly from Gastaldi's *Dell'Universale* (1550), as is the map of the Americas in the 1563 atlas (ItVe11) (though the world chart in double cordiform projection is taken from Gerardus Mercator's 1538 world map). The nautical charts are clearly derived from the work of the Ancona cartographers Benincasa and Freducci, as one can see from the shape of Ireland, the channel separating England and Scotland (with its characteristic bridge or node), and the caesura that elides the Aegean and thus enables the cartographer to get the eastern Mediterranean and the Black Sea on one chart. The link with the Benincasa family of cartographers is made even clearer by the continuing reference to the mythical islands of Antilia and Salvaga in the sheet of the Atlantic in the 1562 atlas and also in the 1560 chart (UKE1). And the curious accordion-style binding of Angelo Freducci's 1555 and 1556 atlases is reproduced in an anonymous atlas in a private collection in Canada, which is undoubtedly by Callapoda.[260] Examining a chart of 1541, Ratti pointed out the striking similarities to an anonymous chart in the Biblioteca Apostolica Vaticana,[261] which Almagià attributed to the workshop of Fra Mauro (and thus held to be a copy of a lost work by the Camaldolese cartographer).[262] However, given that Caraci subsequently argued that the BAV chart was produced in Ancona by one of the Freducci,[263] here again Callapoda could have copied from an Ancona cartographer—and his link with Fra Mauro would be merely indirect.

In spite of the growing trade in printed maps and the availability of such complete works as Ptolemy's *Geography* and Sebastian Münster's *Cosmography* (both in various editions), the market for manuscript charts and atlases in Venice during the second half of the sixteenth century must have remained healthy, as it continued to attract a number of experts from outside. After having worked for some time in his native Palma, the Majorcan Bartomeu Olives is known to have produced a 1559 atlas (UKO1) and a 1562 chart in Venice,[264] probably stopping in the city for a few years on his way to continue his career in Messina and Palermo.

A much more significant arrival was that of the Portuguese Diogo Homem. Son of the well-known cartographer Lopo Homem, he must have already taken up his father's craft when in 1544 he was involved in a murder and exiled to Morocco. Taking advantage of his release on parole, he escaped to England, where he seems to have continued working as a cartographer (though no chart from this period survives). Homem obtained a royal pardon in 1547, but we do not know if he returned to Portugal or if the early part of his career continued in England or elsewhere, since his earliest extant works bear no indication of where they were produced. We do know, however, that he was active in Venice from 1568 to 1576, achieving a certain fame for himself, so much so that one of his nautical charts of the Mediterranean was engraved by Paolo Forlani in 1569. Caraci suggests that he arrived in the city in 1563, the year in which he begins to define himself as "lusitanus" when signing his works (a pointless detail if he was working in his native country), while Cortesão and Teixeira da Mota argue that he was already in the city in 1557, the year of his first known dated work.[265]

Until today, it was believed that the sole Venetian active in Venice in the sixteenth century was Antonio Millo, who in his later works is called "Armiragio al Zante" and

260. Joan Winearls, *The Atlas as a Book, 1490 to 1900: Guide to an Exhibition in the Thomas Fisher Rare Book Library, University of Toronto, 18 October 1993–14 January 1994* (Toronto: University of Toronto, 1993), 3.

261. Antonio Ratti, "A Lost Map of Fra Mauro Found in a Sixteenth Century Copy," *Imago Mundi* 40 (1988): 77–85. Private collection: Gallerie Salamon Augustoni Algranti, *Libri Antichi e Manoscritti* (24 October 1984); Christie, Manson and Woods, *Valuable Travel, Natural History Books and Atlases,* 25 April 1990 (London: Christie, Manson and Woods, 1990), 58–59. The map bears a crest and the initials F. Z., which Ratti identifies as those of Francesco Zeno the Elder, commander of a squadron of galleys.

262. Almagià, *Monumenta cartographica Vaticana,* 1:32–40.

263. Caraci, "Italian Cartographers."

264. Sold in London at Sotheby's June sale. See Ian McKay, "Bids and Pieces," *Mercator's World* 6 (2000): 58–62, esp. 62.

265. Giuseppe Caraci, *Tabulae geographicae vetustiores in Italia adservatae: Reproductions of Manuscript and Rare Printed Maps, Edited and Explained, as a Contribution to the History of Geographical Knowledge in the Period of the Great Discoveries,* 3 vols. (Florence: Otto Lange, 1926–32), 1:3–6, and Cortesão and Teixeira da Mota, *Portugaliae monumenta cartographica,* 2:7–11.

"Armiragio in Candia." In a recent study, however, Tolias convincingly showed that Millo must have originally been a Greek from the island of "Milo," listed in the Greek community of Venice.[266] He is the author of an *isolario,* a *portolano,* a treatise on navigation, and nautical charts and atlases. His first known work is a nautical chart of the area of the Mediterranean dated 1567, which the cartographer describes as a "cosmographus." Nordenskiöld also mentions a nautical world chart dated 1582 that was in the BL collection;[267] but all trace of the work seems to have been lost at the end of the nineteenth century. Another undated world chart, signed "Antonius Millo fecit," in which the areas of North America and Africa are damaged, recently came onto the market and can presumably be dated to around 1580,[268] while an anonymous chart of the central and eastern Mediterranean is also attributed to Millo (AW7). However, the cartographer's most important known works are two large-format atlases: the first was produced in the period 1582–84 and contains twenty-three charts and maps (ItRo8); the second, dated 1586, contains a total of fourteen charts and maps and twenty-eight pages of explanatory text (GeB2). Venetians' nautical and land maps of the world as known at the time give a valuable summary of their geographical knowledge at the end of the sixteenth century.

The influence of cartography and navigation as practiced in the Venetian Republic[269] can also be seen in the Aegean islands that were once part of its dominion, for example, in the work of Nicolaus Vourdopolos. A native of Patmos, this cartographer was probably a monk, given that he defines himself in one chart as a *lector* (a monastic position) and is known to us only through two nautical charts. The first, once in the archives of the Counts Guidi of Volterra, shows only the eastern Mediterranean and bears the date 1608;[270] the second, signed but undated (FrP36), shows the whole of the Mediterranean (fig. 7.20). In both works numerous place-names are simply Greek transcriptions of Venetian originals, sure proof of the use of source material produced in Venice. The author of these two charts has been identified as a monk of the same name who, in 1609, signed a document in the Monastery of Saint John on Patmos,[271] which is therefore assumed to be the place where the cartographic works were produced. I should also mention an anonymous atlas in Greek (ItL2) that bears numerous similarities to the chart in figure 7.20, particularly in the writing and decorative features; it might, with some reservations, be attributed to Vourdopolos. However, another anonymous Greek atlas (USNY1) seems to be by another hand and was perhaps produced in Venice itself (the only city honored with a vignette).[272] Undoubtedly the city had a large Greek community, and there were numerous Greek sailors and pilots on the ships that used its port: indeed, a special *portolano* in Greek was published in Venice in 1573, the very year in which a treaty with the Turkish sultan reopened the ports of the East to Venetian trade.

But by the early years of the seventeenth century, the Venetian trading fleet had shrunk considerably; the products being traded were carried mainly in foreign vessels, and the Venetian nobles showed less and less interest in commerce. Beleaguered by Muslim pirates and the Uskoks[273]—as well as by legitimate competition from the traders of Ragusa, Marseilles, England, and the Netherlands—the port of Venice gradually turned from an international center of trade into an important regional trading post. This change can be seen in the cartography of those years, with output tending to be limited to regional nautical charts covering only the Adriatic and the Aegean, as one can see from the works produced between 1612 and 1630 by Alvise Gramolin (fig. 7.21)[274] or an undated work by Hieronimo Masarachi (USCh11). The other extant works from this century are simply exercises

266. Tolias observes, moreover, that no Antonio Millo appears among the officials listed in the Venetian navy in the period under examination and that the term *armiragio* or *armiraglio* (admiral) was also used to indicate an inspector of harbors or a head pilot. Some sources list the name of Antonio da Milo as an expert pilot. George Tolias, *The Greek Portolan Charts, 15th–17th Centuries: A Contribution to the Mediterranean Cartography of the Modern Period,* trans. Geoffrey Cox and John Solman (Athens: Olkos, 1999), 40–41.

267. Nordenskiöld, *Periplus,* 67.

268. Christie, Manson and Woods, *Valuable Natural History and Travel Books, Atlases and Maps,* 25 October 1995 (London: Christie, Manson and Woods [1995]), 104.

269. The works produced by the Jewish cartographer Jehuda ben Zara, probably a native of Zara in Dalmatia, can also be seen as reflections of the Venetian cultural environment of the day. He is known to have produced two maps in the city of Alexandria, at the time frequented by Venetian ships: one in 1497 (now in the Biblioteca Apostolica Vaticana), the other in 1500 (USC1). A third map was produced in 1505 in Safad in Galilee (USNH1), where there was an important center of study. Almagià, *Monumenta cartographica Vaticana,* and Arthur Dürst, *Seekarte des Iehuda ben Zara (Borgiano VII) 1497* (Zurich: Belser, 1983).

270. Magnaghi, "Carte nautiche esistenti a Volterra."

271. Monique de La Roncière and Michel Mollat du Jourdin, *Les portulans: Cartes marines du XIII^e^ au XVII^e^ siècle* ([Paris]: Nathan, 1984), 243–44; in English, *Sea Charts of the Early Explorers, 13th to 17th Century,* trans. L. le R. Dethan (New York: Thames and Hudson, 1984).

272. In addition to those already mentioned, there is another known nautical chart in Greek. Sold in Milan by the Libreria Antiquaria Ulrico Hoepli in 1942, it was sold again in London in 1990 by Clive Burden and bought by the Benaki Museum, Athens (GrA2). It appears to have been drawn in a Venetian-influenced environment, if not in Venice itself.

273. Dalmatian people devoted to piracy in the Adriatic.

274. FrP38, ItVe2, and ItVe47, as well as the chart of the Aegean that once belonged to Nicolò Barozzi (Uzielli and Amat di S. Filippo, *Mappamondi,* 189).

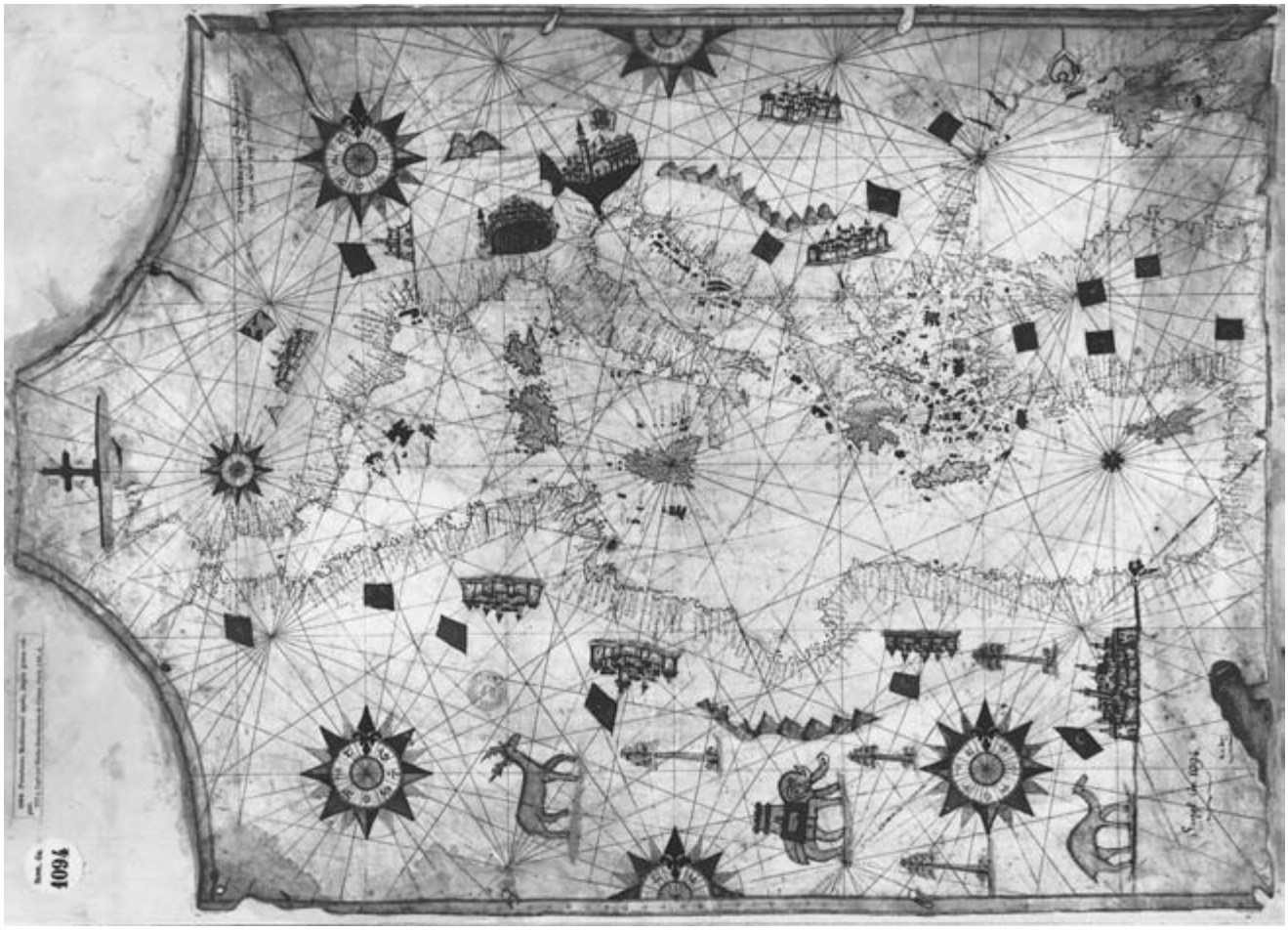

FIG. 7.20. NAUTICAL CHART OF THE MEDITERRANEAN BY NICOLAUS VOURDOPOLOS. Undated and with no indication of place of production. Size of the original: 50 × 59 cm. Photograph courtesy of the BNF (MS. suppl. Grec 1094, fol. 1).

in copying, for example, the 1669 chart by Admiral Marco Fassoi[275] or the 1646 atlas by Friar Nicolò Guidalotti of Mondavio (ItVe7), or else simplified drawings with few place-names intended to illustrate such manuscript treatises on navigation as Gasparo Tentivo's "Nautico Ricercato" (ItVe22 and USCh19). However, in the seventeenth-century the city continued to attract the remaining experts of a craft on the wane, as one can see from the presence of the Marseilles cartographer Jean François Roussin, who produced various charts and atlases in Venice between 1660 and 1673[276] before returning to Toulon and Marseilles to spend the last years of his working life. Venice was also probably the place where the Florentine Filippo Francini drew up the small atlas mentioned at the very beginning of this chapter, which is signed and dated 1699 but gives no indication of the place of production: two of its six charts are dedicated to large-scale representations of the Adriatic, which remained under the dominion of the Venetian Republic (AW9).

ANCONA

Cartography in Ancona began in the late fifteenth century with Grazioso Benincasa, author of numerous charts and atlases and one of the most important cartographers of the century. Though of a noble family that originated in Gubbio, Grazioso differed from his relatives in that instead of taking up public office in his native city of Ancona, he spent the first part of his adult life on the seas, as a *padrón de nave* (ship's captain).[277] One important relic of this period is a *portolano* of the Adriatic, Aegean,

275. ItVe14 and ItVe55. What is more, the Huntington Library in San Marino, California, has a four-sheet atlas printed on parchment and completed by hand that was produced in 1679 by one "Marcheto Fassoi."

276. FrMa5, FrP49, ItTo11, ItVe54, ItTr4, USNY31, and USSM14.

277. Marina Emiliani, "Le carte nautiche dei Benincasa, cartografi anconetani," *Bollettino della R. Società Geografica Italiana* 73 (1936): 485–510.

FIG. 7.21. NAUTICAL CHART OF THE ADRIATIC BY ALVISE GRAMOLIN. Venice (?), 1624.
Size of the original: 82 × 24 cm. Photograph courtesy of the Museo Correr, Venice (Port. 44).

and Black Sea written sometime between 1435 and 1445, probably when the author was still at sea, as he comments: "Ports and land features are not taken from any map, but given from direct experience as they appear to the eyes."[278] After he had experienced twenty-five years of command, his life underwent radical change due to an incident that was quite common at the time: the capture of his ship by Genoese pirates. Having abandoned the sea, he dedicated himself to cartography, first in Genoa and then for a long period in Venice, from which he made brief visits to Rome and Ancona, and finally in his native city for the last years of his working life (his last signed work dates from 1482, though we have no information as to the actual year of his death). Just one of his six sons, Andrea, followed in the father's footsteps, and even he dedicated to cartography only the time left over from the performance of duties arising from his various important public offices. His three known works date from a wide span of time: the first, an atlas, dates from 1476; then comes a chart in 1490 and another in 1508.[279] All of these are slavish copies of his father's work, with absolutely no updating of information:[280] indeed, the last of Andrea's works still shows the legendary Atlantic islands of Antilia and Selvagia.

However, in Ancona there was another full-time cartographer: Conte di Ottomanno Freducci, the author of various charts and atlases that date from the period 1497–1539. A nautical chart in the Zentralbibliothek of Weimar bearing a practically illegible inscription is one of the works attributed to Freducci, and its badly damaged date has been variously read as 1524, 1424, and 1460. Kretschmer has no doubt about the attribution and supports the third of these readings, while Errera accepts the second, and therefore rejects the attribution to Freducci.[281] Almagià, for his part, is inclined to accept that this is an early work of the cartographer, reading the date as very close to 1497, the year for which his professional activity is first documented.[282] Recently Baldacci has suggested that if the date on the Weimar chart is read as 1460, this could be the work of a predecessor.[283] However, I should add that the "clearly medieval features

278. Ernesto Spadolini, "Il *Portolano* di Grazioso Benincasa," *Bibliofilia* 9 (1907–8): 58–62, 103–9, 205–34, 294–99, 420–34, and 460–63.

279. V1. Arthur Dürst, *Seekarte des Andrea Benincasa (Borgiano VIII) 1508* (Zurich: Belser, 1984).

280. Emiliani, "Le carte nautiche," 488.

281. Konrad Kretschmer, *Die italienischen Portolane des Mittelalters: Ein Beitrag zur Geschichte der Kartographie und Nautik* (Berlin: E. S. Mittler und Sohn, 1909; reprinted Hildesheim: G. Olms, 1962), 147–48, and Carlo Errera, "Carte e atlanti di Conte di Ottomano Freducci," *Rivista Geografica Italiana* 2 (1895): 237–41.

282. Almagià, *Monumenta cartographica Vaticana,* 1: 60–61.

283. Baldacci, *Introduzione allo studio,* 109.

of the geographical information," such as the inclusion of the Atlantic island of Antilia, which Errera cites as proof that the work cannot be by Freducci,[284] is not really relevant here, given that such features continued to be shown on a number of sixteenth-century charts. An attribution to Freducci therefore seems reasonable, with the date adjusted accordingly.

In his career of more than forty years, Freducci produced a number of nautical charts and atlases limited to the area of the Mediterranean (fig. 7.22). One exception is a chart of the Atlantic that shows Western Europe along with part of the Mediterranean, Africa as far south as the Gulf of Guinea, ample stretches of North America (from Newfoundland to Florida), and Brazil in the southern continent. The chart is unusual in that it is drawn up using two different scales, as one can see from the two scale bars given on the neck alongside the inscription: the scale for the Old World is about 1:12,000,000, while that for the New World is about 1:6,000,000. The inscription is clearly legible but incomplete, as part of the neck has been removed with a clean cut, apparently intended to remove the date. Casanova points out that the chart shows Florida, discovered in 1513, but not the Mar del Sur, sighted the same year, and therefore deduces that it must date from very soon after that year, around 1514–15.[285] In reply, Caraci reiterates the point that a chart is not necessarily to be dated on the basis of the information it contains, especially if that information relates to Spanish or Portuguese discoveries, news of which was often delayed by their treatment as state secrets. He therefore argues that the chart was probably based on an obsolete model and could be dated to around 1527–30.[286]

Support for this dating comes from the fact that the nautical atlases that form the bulk of Freducci's output from 1528 onward were based on a model from the previous century: the order of the sheets, the drawing of the coastlines, and the place-names all reflect the atlases of Grazioso Benincasa, with no major alteration (apart from the exclusion of the legendary islands of Antilia and Salvagia).

From the period between Freducci's last known work, an atlas of 1539, and the first known work of his son Angelo, a chart of 1547, is a 1542 nautical chart by Rocco Dalolmo, an Ancona cartographer who has left no other extant work or biographical traces. The chart is very close to the work of the Benincasa family and the elder Freducci, including geographical information that is almost a century out of date,[287] in particular with regard to the outline of the British Isles, Scandinavia, and the Baltic, and in the charting of the major European rivers and the mountain chains of Europe and Africa.

This chronological sequence, plus the stylistic similarities traced in the work of Grazioso Benincasa, Conte di Ottomanno Freducci, Rocco Dalolmo, and finally Angelo

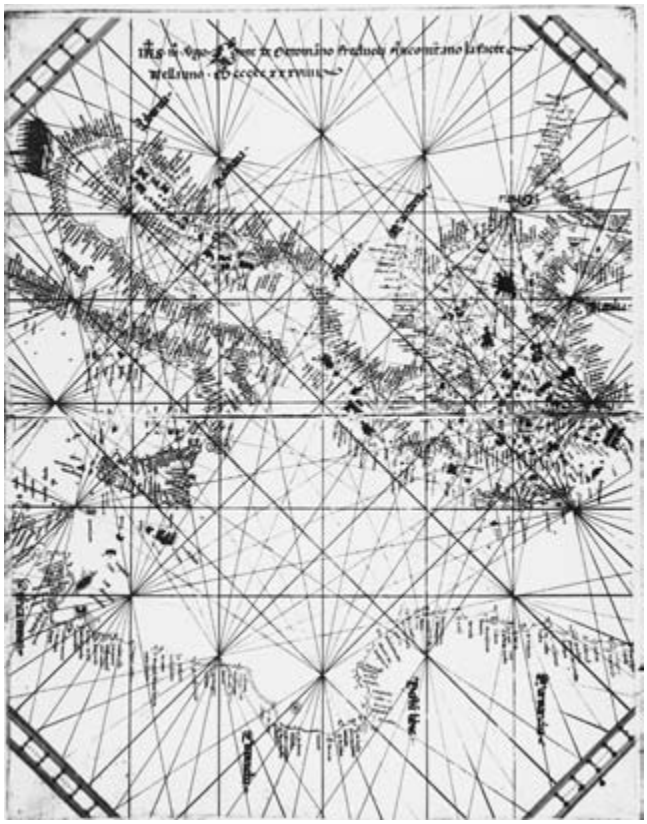

FIG. 7.22. SHEET FROM THE ATLAS BY CONTE DI OTTOMANNO FREDUCCI. Ancona, 1539.
Size of the original: 45 × 35.5 cm. Photograph courtesy of the Biblioteca Comunale dell'Archiginnasio, Bologna (ex vetrine n. 1, tav. 2).

Freducci, might lead one to suppose that they succeeded each other as head of a single workshop (while Andrea Benincasa, having learned his father's craft, dedicated his life to public office and only occasionally worked as a cartographer). However, this is nothing but a theory for which there is no concrete evidence except the simple fact that the market in Ancona must have been so modest that it is unlikely that two or more cartographic workshops could have survived there.

Angelo Freducci, who signs himself in his 1555 atlas as the son of Conte Freducci, is known to have produced four signed works (two charts and two atlases) between 1547 and 1556 (BB2, UKGr7, ItMa2, and ItRo10) and is also considered the author of another anonymous chart (UKGr4). Angelo Freducci's sources are strikingly out of

284. Errera, "Carte e atlanti," 240.

285. Eugenio Casanova, *La carta nautica di Conte di Ottomanno Freducci d'Ancona, conservata nel R. Archivio di Stato in Firenze* (Florence: Carnesecchi, 1894), 14.

286. Caraci, "Italian Cartographers," 25–26.

287. Baldacci, *Introduzione allo studio,* 109–13.

date: for example, the four maps of Asia in the atlases seem to be based on the geographical knowledge contained in Fra Mauro's 1459 world map. So here we see how Angelo worked: denied access to news of the recent Spanish and Portuguese discoveries, he drew on a number of sources by then obsolete to produce atlases that could still satisfy an Ancona market that was already entering a phase of premature decline. In fact, in 1532 the city came under Papal rule and lost all independence as a commune, but neither the Roman nobility nor the officers of the Papal fleet seem to have commissioned any works from the city's cartographers. As for the chart Bartolomeo Bonomi drew up in Ancona, we have already seen how Uzielli and Amat di S. Filippo's dating of 1570 and the claim that the work was actually used by Marcantonio Colonna at the Battle of Lepanto are equally untenable.

Although Grazioso Benincasa worked for a short period in fifteenth-century Rome, the only other nautical chart produced in the Eternal City appears to have been a 1596 work by Bartolomeo Crescenzio, which was undoubtedly the model for the printed chart in his *Nautica Mediterranea*.[288]

Civitavecchia was for some time the home of Jacopo Scotto, a Ligurian born in Levanto, who while there drew up a chart in 1589 and a nautical atlas in 1592. However, by 1593 he had already moved to Naples, perhaps in search of better working conditions.

NAPLES

In the sixteenth and seventeenth centuries, Naples was one of the most populous cities in the Christian world, with a sizeable flow of immigrants who provided not only manual labor but also the skilled craft work involved in the production of luxury items (among which one might include nautical charts).

However, for the first half of the sixteenth century the only cartographer known to have been at work in the city is Vesconte Maggiolo, who lived there between 1511 and 1516 and married a Neapolitan woman. His extant works from that period comprise three charts of the Mediterranean, two atlases (which show part of the New World), and a nautical world chart dated 1516. This, his last known Neapolitan work, covers roughly the same area as the chart in Fano (ItFa1) and, in effect, reflects the state of geographical knowledge in the very early years of the century.[289]

After Maggiolo's return to Genoa, cartography in Naples seems to have come to a standstill for almost fifty years, in spite of the fact that the large-scale public works projects promoted by the viceroy Don Pedro de Toledo had further added to the prosperity of the city. Chartmaking resumed with the arrival in Naples of the Majorcan Olives family, who subsequently Italianized their name to Oliva.

We know that in 1563 Jaume Olives was already in the city after having worked in Marseilles and, for a much longer period, in Messina. Given the scale of his output in Naples, he must have opened some sort of workshop there before returning to Marseilles (where his presence is recorded in 1566) and then ended his career in Barcelona. His extant Neapolitan works comprise two charts and two atlases (dated 1563), together with a chart of 1564, all of them covering the area of the Mediterranean. When Jaume left the city, his son Domingo stayed behind, but he is known to us only through two charts dated 1568, the signature of which makes the relationship between the two cartographers clear ("Domingo filio de maistro Jaume Ollives mallorquin").

1580 saw the beginning of Joan Riczo Oliva's career, with an atlas signed "Joan Riczo alias Oliva figlio di mastro Dominico" and probably produced in his father's workshop.[290] Comprising a total of seventeen charts covering all of the known world, from southern California to Korea, this is undoubtedly the work of an expert cartographer.[291] There are five extant signed nautical charts by Joan Riczo Oliva that were produced in Naples between 1587 and 1588; but in 1590 he seems to have moved to Messina, and thus the Olives family workshop closed down.

Another cartographic product of the Kingdom of Naples is a small 1574 atlas signed by Aloisio Cesani, who declares himself "ydruntinus," that is, a native of Otranto. Even though no place of production is mentioned, it is safe to assume it was drawn up in Puglia (Apulia), as the binding bears the coat of arms of the Gonzaga, princes of Molfetta.[292]

Toward the end of the century, numerous cartographers, some foreign, were at work in the city, though generally only for short periods of time. An important figure is the Calabrian monk Domenico Vigliarolo from Stilo, who we know was in Palermo in 1577; it was there that he produced a nautical chart (fig. 7.23). Two other charts, similarly limited to the Mediterranean area, seem to have been produced in 1580 in the city of Naples, where Vigliarolo had settled, dedicating himself to the study of cosmography and navigation and working on the design of an instrument that would give an accurate reading of longitude at sea. In 1581 he sent a letter to the king of

288. Nordenskiöld, *Periplus,* 68.

289. Caraci, "Vesconte Maggiolo (1511–1549) e il Nuovo Mondo," 249.

290. Vladimiro Valerio, *Società uomini e istituzioni cartografiche nel Mezzogiorno d'Italia* (Florence: Istituto Geografico Militare, 1993), 45.

291. Bound together with the seventeen charts by Joan Riczo Oliva are two by Baldassare Maggiolo dated 1588.

292. Mario Longhena, "Atlanti e carte nautiche," 171–73.

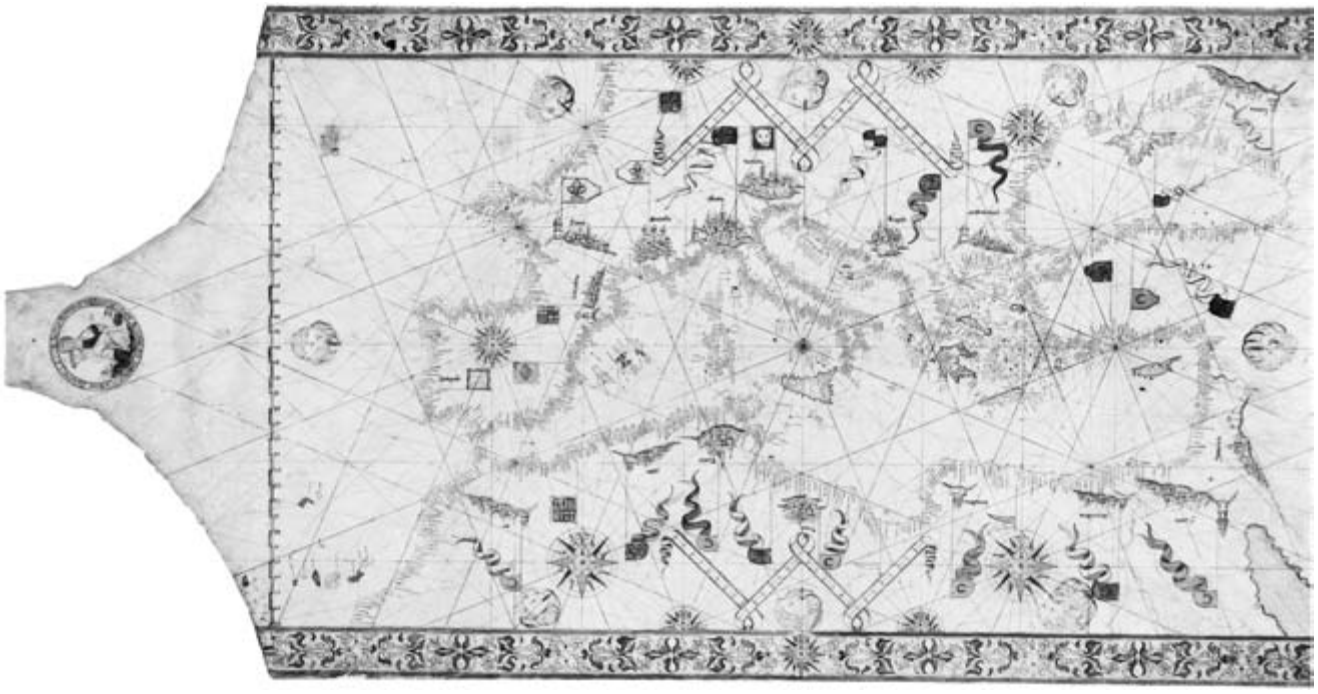

FIG. 7.23. NAUTICAL CHART OF THE MEDITERRANEAN BY DOMENICO VIGLIAROLO. Palermo, 1577. Size of the original: 54 × 84 cm. Photograph courtesy of the Map Collection, Yale University Library, New Haven (*49 1577).

Spain in which he claims that his designs have been successful and offers to go to Seville and thence undertake a voyage to the Indies to test the instrument.[293] Having obtained funds for the journey, he went to Seville and demonstrated his invention, a solar clock paired with a compass to determine magnetic declination, at the Casa de la Contratación. Based on the erroneous assumption that the variations in magnetic declination were regular over the surface of the earth, his instrument was simply an advanced form of the *brujula de variacion* designed in 1525 by the Seville pharmacist Felipe Guillén, and differed from a similar device presented by a pilot of the Casa de la Contratación, Rodrigo Zamorano, merely in that it allowed readings of the declination to be taken at any hour of the day or night (rather than only at dawn and dusk). During this period Sancho Gutiérrez, *cosmógrafo del rey,* died, and Vigliarolo, in an attempt to obtain this prestigious appointment, presented a number of charts as proof of his ability (the duties of office would include the drawing of nautical charts). Despite the opposition of the *piloto mayor,* Alonso de Chaves, and Zamorano (who wanted the post for himself), the Italian got the job. A few years later, however, he returned to Naples, spending almost the whole of 1589 in the city, where he produced two charts that are signed with the Hispanicized name Don Domingo de Villaroel and bear the claim that their author is cosmographer to his majesty.[294] Having returned to Seville at the end of 1589, Vigliarolo stayed there until 1596, when, having clashed with Zamorano, who in the meantime had been appointed *piloto mayor,* he moved to Bordeaux, where all trace of him is lost.

Caraci is probably correct when he suggests that for some years there was an official cosmographer to the Kingdom of Naples, a post that Vigliarolo held before he left for Spain. In effect, the cartographer Joan Martines, who had been at work in Messina for more than thirty years, moved to Naples around that time, and in 1590 and 1591 produced works that he signed as *cosmographo del rey.* Hence, it seems safe to assume that he replaced Vigliarolo after his departure.

1590 also saw the production of two atlases in Naples: the first, a six-sheet volume, is signed by Jacques Dousaigo (UKGr10); the second, totaling four charts, is

293. Cesáreo Fernández Duro, "Cartas de Marear: Las de Valseca, Viladestes, Oliva y Villarroel," *Boletín de la Sociedad Geográfica de Madrid* 17 (1884): 230–37; Roberto Almagià, "Un cartografo e cosmografo calabrese: Domenico Vigliarolo di Stilo," *Archivio Storico per la Calabria e la Lucania* 12 (1942): 221–28; and idem, "Notizie su due cartografi calabresi," *Archivio Storico per la Calabria e la Lucania* 19 (1950): 27–34.

294. Besides the above-mentioned charts, there is also an extant seven-sheet atlas by Vigliarolo—one sheet of which covers the Atlantic coast of North America. Caraci also attributes to him the anonymous chart known as Borgiano VI (V16). Caraci, "Le carte nautiche anonime," 165–93.

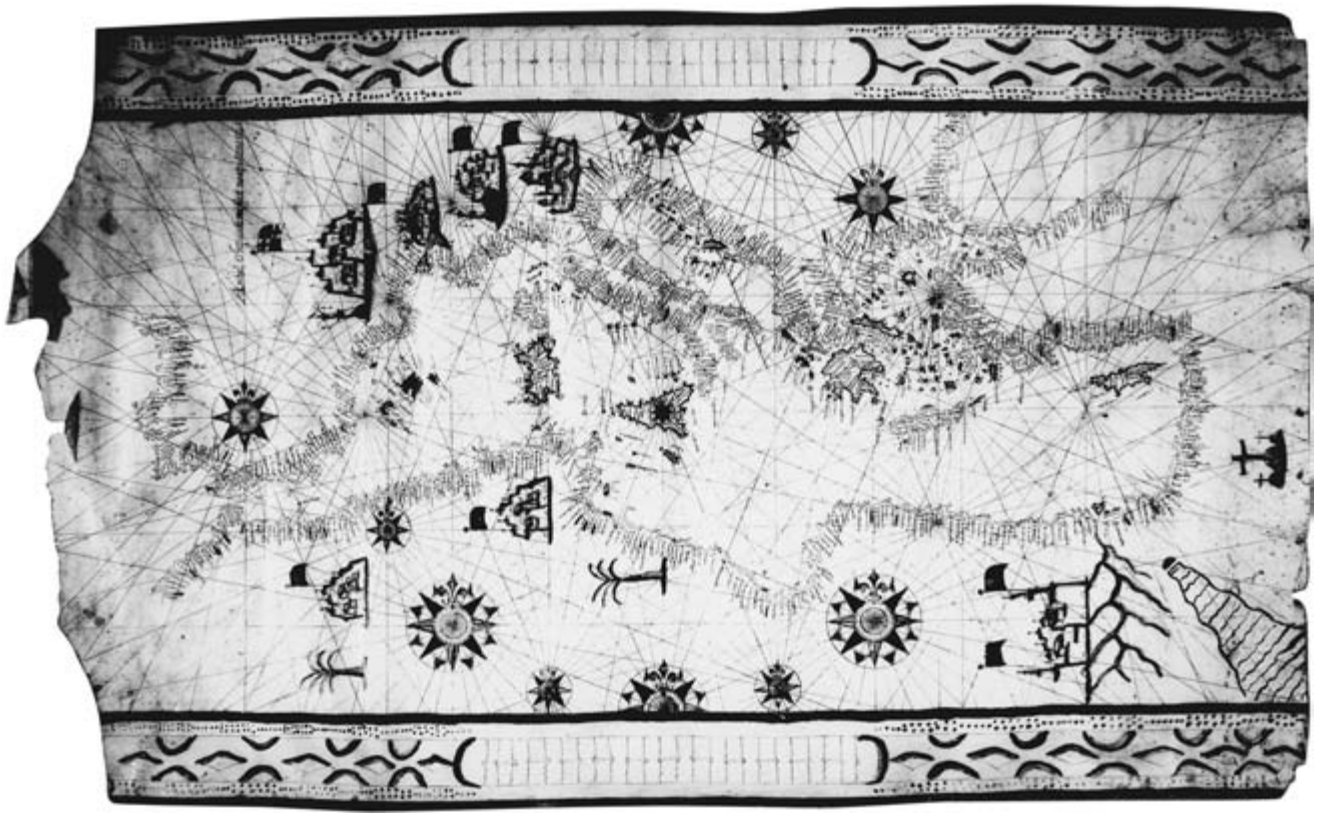

FIG. 7.24. NAUTICAL CHART OF THE MEDITERRANEAN BY ANNIBALE IMPUCCIO. Naples, 1625. Size of the original: 46 × 77 cm. Photograph courtesy of the Biblioteca Civica, Verona (MS. 2966).

signed by Jaime Dossaiga.[295] Again it seems safe to assume that these were one and the same man, though we have no other information about him. In 1593 the city was home to Jacopo Scotto of Levanto (ItBo3) and Vincenzo Volcio of Ragusa; the latter then moved to Leghorn before returning to Naples in the last years his career, around 1606–7.

From 1601 to 1603 Joan Oliva was in the city on the peregrinations that, after a long period of work in Messina, would also take him to work in many other Mediterranean ports. However, there was an irreversible decline in cartographic work from the beginning of the seventeenth century onward. In fact, as the century advances, the only extant works are a chart dated 1615 and signed Sebastiano Condina (ItVe5) and two charts of 1622 and 1625, the work of a certain Annibale Impuccio (fig. 7.24).[296] After that year, it would seem that no cartographers were at work in Naples.

MESSINA

Given its central geographical location, Messina turned out to be a key Mediterranean city during the sixteenth and seventeenth centuries, its development resting not only on its control of the Strait of Messina and the export of Sicilian wheat, but also on its nearness to Naples, the populous economic capital of the area, and Malta, the Christian outpost against Turks and Barbary pirates. In fact, traffic through the Strait of Messina increased noticeably, as the unsafe conditions in the Channel of Sicily led Christian ships carrying merchandise from the East to the ports of Western Europe to choose a route that was, at least in theory, better protected against the incursions of corsairs.

The fortification work initiated by Ferrante Gonzaga eventually enabled the city to act as a base for Spanish or allied fleets and to withstand possible attack by Turks or Barbary pirates. And it was from here that the Christian fleet would set sail for Lepanto and victory; so in 1571 Messina was at the center of an event that, to contemporaries, seemed decisive for the future of the world. Natu-

295. Christie's, New York, 8 October 1991, Lot 211. See Campbell, "Chronicle for 1991," 138. This appears to be the atlas mentioned by Uzielli and Amat di S. Filippo, which at the time was in private hands. The name of the cartographer, however, is given as Jaime De Ossaiga. Uzielli and Amat di S. Filippo, *Mappamondi,* 292.

296. The two charts are ItVr3 and ItVr4: the older covers the Mediterranean, the more recent the Aegean.

rally enough, the constant presence of merchant shipping and navy galleys stimulated the growth of all those commercial and craft activities associated with the sea.

The first Messina cartographer known to us is Pietro Russo, very few of whose maps survive. The only one bearing a perfectly legible signature is one apparently completed in Messina in 1508 (SpBa1). A second chart, once the property of the noble family of Merenda of Forlì (who had inherited it from an ancestor in the Knights of Malta), had a partly damaged inscription in which the date was illegible, while a third chart (FrP5) bears an inscription in which only a few letters are legible (however, these—together with comparison with the 1508 chart—are enough to confirm the attribution of the work).[297] Another anonymous chart (FrP6) can also be attributed to Pietro Russo, though it too is badly damaged (it had for a time been used in the binding of the cartulary of an Avignon notary).[298] These few charts all cover the area of the Mediterranean and were probably produced over a rather short period of time—perhaps ten years or so. The inscriptions tell us that the cartographer was also a native of Messina, so even though his style recalls that of Catalan cartographers, one can rule out that he came from Barcelona or Majorca.

Russo was followed in his trade by his son Jacopo, who has left us a large number of works spanning a period of more than sixty years. Archive documents reveal that in the early part of his career Jacopo's business premises were a *barracha* (shack), perhaps inherited from his father, which stood near the customs docks in the port district. The shack was subsequently demolished upon order of the viceroy, perhaps because it got in the way of the work on the modernization and consolidation of the sea defenses. However, it was reconstructed, at the state's expense, in another part of the city in order to enable Jacopo to continue working at a craft that was considered of public importance.[299]

Jacopo's extant works comprise fifteen charts and a nautical atlas, all produced from 1520 to 1588, though there are long gaps between these dates (most significantly from 1570 to 1588, the year of the last charts to bear Jacopo's name).[300] Given that a career lasting sixty-eight years is rather difficult to explain, it has been suggested that there were two cartographers of the same name, though there is absolutely no proof to confirm such a theory.[301] Almagià argued that after Jacopo Russo's death his workshop must have gone on producing charts in his name, with the inscription of the later works added by a successor who had learned how to imitate Russo's handwriting; it would be wrong to speak of faking here, when the main purpose was simply to indicate the workshop of provenance. In support of this theory, Almagià points out that the later charts are poorer in quality and therefore undoubtedly the work of some successor.[302]

The 1521 atlas (ItMo2) is of particular interest: it contains twelve sheets covering not only the area of the Mediterranean but also the coasts of Africa and Asia (as far as Sumatra and the Malacca peninsula), and so includes all the coastal areas known to Ptolemy and depicted in contemporary printed versions of his work. For his coastlines Russo seems to have relied on Portuguese sources of some ten years earlier: in fact, while the outline of Madagascar is fairly accurate, that of the island of Sumatra is totally invented. What is more, the cartographer does not seem to have consulted a number of sources, and the single model he did use is copied rather lackadaisically, with frequent errors in transcription and the duplication of place-names.[303] Yet for all this, the work does form a veritable atlas, which was probably produced on commission. Around the middle of the century, perhaps due to the flourishing port, the presence of a Spanish fleet and garrison, and the large numbers of allied warships visiting the city, the market in nautical charts and atlases was so healthy in Messina that other cartographic workshops opened in direct competition with that run by Russo.

The first known atlas by Joan Martines, one of the most prolific cartographers of the century, dates from 1556; and he appears to have worked in the city right up to his departure for Naples in 1589. All in all, his extant works total around thirty, with another fifteen unsigned works also attributed to him.[304]

297. Almagià, "I lavori cartografici," 302–3, and Foncin, Destombes, and La Roncière, *Catalogue des cartes nautiques,* 34–35.

298. Foncin, Destombes, and La Roncière, *Catalogue des cartes nautiques,* 35–36.

299. Amelia Ioli Gigante, "Le officine di carte nautiche a Messina nei secoli XVI e XVII," *Archivio Storico Messinese,* 3d ser., 30 (1979): 101–13, esp. 102–3.

300. We know of three charts dated 1588. The first was once in the Biblioteca Trivulziana, Milan (Carlo Errera, "Atlanti e carte nautiche dal secolo XIV al XVII conservati nelle biblioteche pubbliche e private di Milano," *Rivista Geografica Italiana* 3 [1896]: 520–27, esp. 523–24) and was destroyed during the Second World War; the second was once the property of Conte Cittadella of Padua (Uzielli and Amat di S. Filippo, *Mappamondi,* 155–56); and the third is now in a private collection in Germany (Thomas Niewodniczański, "Vorstellung zweier im 16. Jahrhundert gefertigter Portolane," in *Das Danewerk in der Kartographiegeschichte Nordeuropas,* ed. Dagmar Unverhau and Kurt Schietzel [Neumünster: K. Wachholtz, 1993], 185–88, esp. 185). Given that the third is not the same size as the second, the third must be added to the list of known works by Jacopo Russo.

301. E. T. Hamy, "Note sur une carte marine inédite de Giacomo Russo de Messine (1557)," *Bulletin de Géographie Historique et Descriptive,* 1887, 167–78, and Pietro Amat di S. Filippo, "Recenti ritrovamenti di Carte nautiche in Parigi in Londra ed in Firenze," *Bollettino della Società Geografica Italiana* 25 (1888): 268–78, esp. 277.

302. Almagià, "I lavori cartografici," 314.

303. Almagià, "I lavori cartografici," 312–13.

304. Rey Pastor and García Camarero, *La cartografía mallorquina,* 101–18. Among the anonymous works that are generally attributed to

While Uzielli and Nordenskiöld held that Martines was Sicilian by birth, Codazzi argued that he was Catalan, pointing out the form of his signature, "Ioan Martines en Messina any," followed by the date, which is very different from that of the Russo family (always written in Latin) and very similar to that of the early Olives, who were Majorcans working in Messina.[305] Cortesão numbers him among Portuguese cartographers, but then, having totally ruled out that he was Italian, goes on to admit the weakness of his own arguments and ends up accepting Codazzi's suggestion that Martines was Catalan.[306]

Caraci starts from the *a priori* impossibility that Martines was Portuguese, then looks at the place-names in his work, where a large number of Italian names are found alongside Catalan and Majorcan forms; he argues that the latter are found due to the presence in Messina of a Spanish-speaking ruling class, to whom Martines would have looked for possible patrons.[307] What is more, in the last works of his Naples period, which were long unknown to scholars, the cartographer actually describes himself as "de Messina," thus resolving the problem of his birthplace. Nevertheless, Caraci does not rule out that the Martines family may have had Majorcan or Catalan roots; indeed, he holds that to be more than probable.

Even though Martines produced a number of traditional sea charts on a single sheet of parchment, the bulk of his work consists of atlases, often covering the whole of the known world. Generally these contain a world map in two hemispheres, usually accompanied by an inscription, and this, just like Agnese's oval world map, forms a sort of workshop trademark.[308] Evolving slightly over time, Martines's world map draws on various models—from the work of Gastaldi to that of Ortelius.[309] According to Codazzi, the sheets covering the area of the Mediterranean repeat a standard sixteenth-century Majorcan model: the outlines for the British archipelago and the Atlantic coasts of Africa are fairly up to date, but the rest of the coastlines are based on models from the previous century.[310] Caraci tends to agree, arguing that the model used by Martines and other cartographers in Messina originally came from Majorca and showed no advance on charts more than one hundred years old.[311]

The situation with regard to the charts of the New World and Asia is rather different. Here the source material seems to have been limited to printed charts, which changed over time, from the plates in Gastaldi's edition of Ptolemy's *Geography* (1548) to Paolo Forlani's *Il disegno del discoperto della Noua Franza* (1565) and Mercator's 1569 *Nova et avcta orbis terrae descriptio* . . . Only in the very last few years of his career, when Martines had been appointed as *cosmographo del rey* in Naples, did the cartographer also draw on unpublished Spanish and Portuguese sources, to which he had access thanks to his position.[312]

In 1557, just after Martines had opened his own workshop, Banet Panades, who declared himself "malloqui," drew up two nautical charts in Messina. He seems to have arrived in the city from Palermo, where he is known to have produced one chart; yet apart from these three works we know nothing about this Majorcan, who seems to have been an active cartographer for only a very short time. As was a certain Rossi, whose signature appears on just one chart drawn up in Messina, in the year 1559.[313]

Over the same period, a much more relevant contribution to cartography was made by the various members of the Olives family, originally from Majorca. The head of this veritable dynasty was Jaume, who signed all of his works as a "Mallorqui," thus emphasizing his origins. We know nothing about his period of apprenticeship, but it is likely that he learned the rudiments of the art in Majorca itself, because his first known work was produced in Marseilles in 1550, when the city had no known cartographic workshop, let alone a school of cartography. In 1552 he went to Messina, working there for a decade before moving on to Naples, then back to Marseilles, and finally to Barcelona. Nordenskiöld has suggested that Jaume was actually a sailor who supplemented his income by drawing charts during his long lay-offs in the ports of the Mediterranean.[314] Caraci not only accepts this hypothesis but suggests it could also be valid for some other contemporary cartographers as the only convincing explanation for their continual moving around.[315] However, Jaume's movements from one port to another seem to have been not just the casual result of the availability of work on board ship: they seem to follow a precise itinerary from Majorca through Marseilles to Messina, then back again via Naples and Marseilles to Barcelona. Of course, in an era when land travel was dif-

Martines often figures a nautical chart of South America now in the Newberry Library (Ayer MS. 20); such an attribution must be false, because the chart shows Le Maire Strait, which was discovered only in 1616.

305. Angiolina Codazzi, "Di un atlante nautico di Giovanni Martines," *L'Universo* 3 (1922): 905–43, esp. 906–7.

306. Armando Cortesão, *Cartografia e cartógrafos portugueses dos séculos XV e XVI (Contribuïção para um estudo completo),* 2 vols. (Lisbon: Edição da "Seara Nova," 1935), 2:207–36. In his following work, Cortesão and Teixeira da Mota, *Portugaliae monumenta cartographica,* he does not mention Martines among Portuguese cartographers.

307. Giuseppe Caraci, "Il cartografo messinese Joan Martines e l'opera sua," *Atti della Reale Accademia Peloritana* 37 (1935): 619–67.

308. The eighteen-sheet atlas presumed to date from 1578 (UKL27) contains three different world charts: one in plane projection, one in two hemispheres, and one divided into twelves spherical segments. Caraci, "Il cartografo messinese Joan Martines," 630–32.

309. Caraci, "Il cartografo messinese Joan Martines," 661.

310. Codazzi, "Di un atlante nautico," 917.

311. Caraci, "Il cartografo messinese Joan Martines," 659–60.

312. Caraci, "Il cartografo messinese Joan Martines," 663.

313. Caraci excludes the possibility that this might be Jacopo Russo. Caraci, "Le carte nautiche del R. Istituto," 44–46.

314. Nordenskiöld, *Periplus,* 65.

315. Giuseppe Caraci, "Una carta nautica disegnata a Malta nel 1574," *Archivio Storico di Malta* 1 (1930): 181–211.

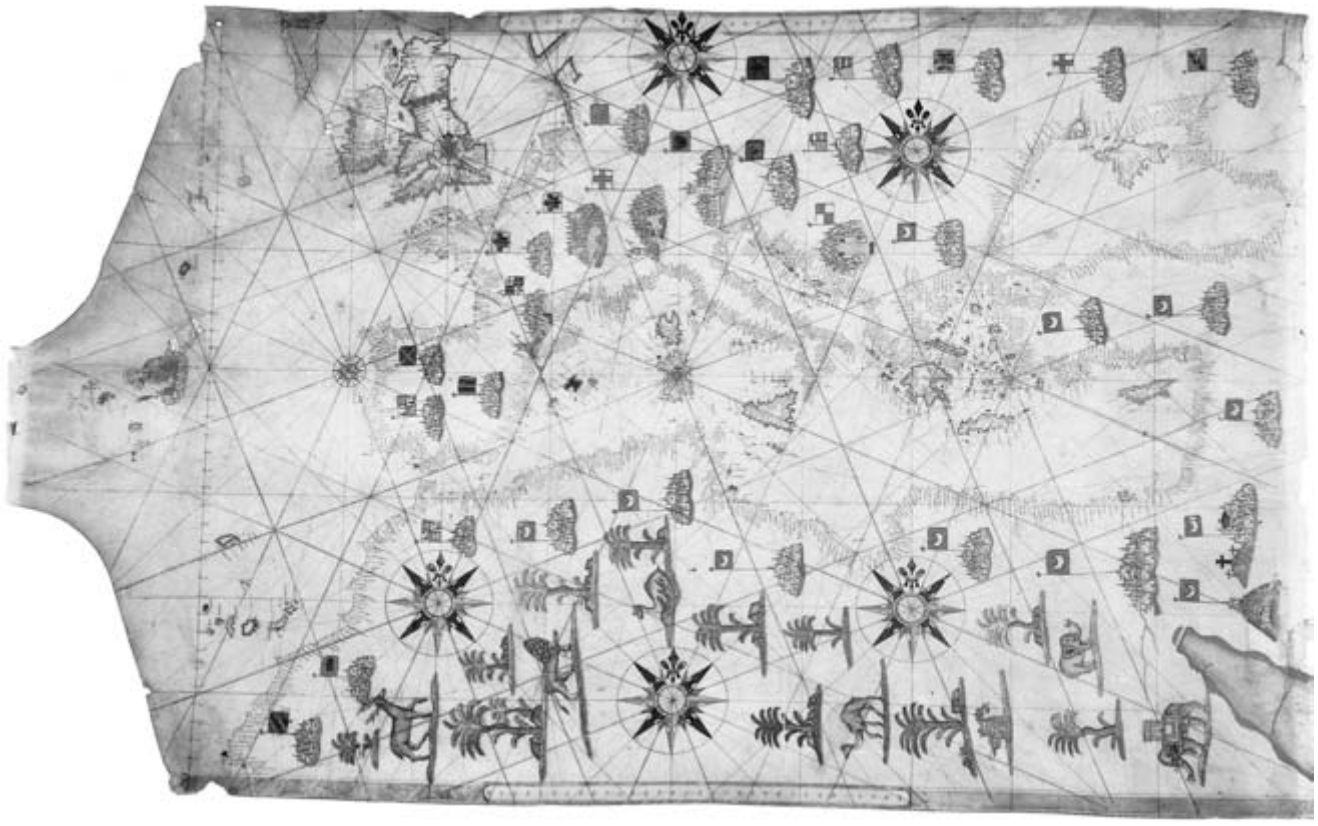

FIG. 7.25. NAUTICAL CHART OF THE MEDITERRANEAN BY JOAN RICZO OLIVA. Messina, 1593. Size of the original: 60 × 94 cm. Photograph © Jean Bernard, courtesy of the Bibliothèque Municipale, Marseilles (MS. 2081).

ficult and dangerous, ships were the best way to get from one port to another, and a cartographer of recognized ability would have had no difficulty in getting a berth (perhaps in exchange for his professional services).

Bartomeu Olives was just as restless as Jaume (though the family relation between the two men cannot be established with certainty). We know that he was at work in Palma de Mallorca in 1538,[316] but sometime after this he must have emigrated, because in a chart of 1552, bearing no indication of place of production, he describes himself as Majorcan (which would obviously have been unnecessary if he had stayed on the island). In 1559 he was in Venice, and then, from 1572, in Messina, where his steady output came to an end with a chart from 1588.[317] All of his charts of this latter period bear the inscription "en Missina en el castillo del Salvador," so they must have been produced in the fortress built at the end of the port promontory to house the Spanish garrison. However, there are no features that distinguish these works from his other charts or those of his contemporaries, hence nothing suggests that they were drawn up for strictly military use. Nevertheless, there seems no reason to doubt that Bartomeu did work inside the fortress, and his explicit reference to the fact was probably dictated by a desire to give his works an official air, and thus establish their quality in the eyes of possible clients.

Bartomeu's extremely lengthy career of more than fifty years is rather puzzling because, unlike Battista Agnese, Jacopo Russo, and Jacopo Maggiolo, Bartomeu had no sizeable workshop that could carry on independently after his death. However, that he was a professional cartographer and not a sailor who dedicated his spare time to drawing nautical charts seems to be borne out by the fact that his movements were primarily dictated by the search for a market for his wares. He may also have been looking for some sort of official backing for his work, and this may explain the long period in Messina that concludes his career.

Just as the professional activity of Bartomeu was coming to an end, Joan Riczo Oliva moved to Messina from Naples. Claiming to be the son of Domingo (and therefore the grandson of Jaume), he would draw up a few nautical charts in the city over the period 1590–94 (fig. 7.25). As he signed his works either "Joan Riczo alias Oliva" or "Joan Oliva alias Riczo," Crinò argued that we

316. ItVe1. R. Albertini, "Di due carte nautiche rinvenute nell'Archivio della Ca' Foscari ed esposte nel locale Laboratorio di Geografia Economica," in *Atti del XVI Congresso Geografico Italiano, Padova-Venezia 20–25 aprile 1954* (Faenza: Stabilimento Grafico F.lli Lega, 1955), 761–68.

317. A chart produced in Palermo (USNY9) bears a clearly falsified date; hence, it is not possible to establish when the cartographer was actually in the city.

are really dealing with the work of two different cartographers;[318] whereas Caraci denied this, pointing out that the adverb *alias* meant that the man could be referred to by either name.[319] It is likely that he adopted this alias to distinguish himself from another Joan Oliva who began working in Messina around the same time.

It is this likely presence of two cartographers in the same city at the same time with the same name that has sometimes made scholars make the opposite mistake and consider them one and the same person. For example, Enrile and Grande argue that they must have been on the basis of the parallel dates and content of their work.[320] Caraci argues that it is more reasonable to accept the distinction between the two men that is made explicit in the inscriptions to their works, adding that Joan Riczo Oliva must have been slightly older than Joan Oliva and that their professional careers overlapped for only a relatively short period.[321]

Joan Oliva's extant works total more than forty, and we know that he spent an uninterrupted period in Messina from 1592 to 1599.[322] Thereafter came a series of peregrinations that took him to Naples (1601–3), back to Messina (1606–8), to Malta (1611) and Marseilles (1612–14), again to Messina (1614), and back to Marseilles (1615). Given the irregular pattern of his movements, they cannot really be considered part of an organized plan, and therefore one might argue that Oliva was a sailor who for fifteen-odd years only occasionally dedicated himself to cartography. It was only after 1618, when he finally settled in Leghorn, that he took up the profession full time for the remainder of his life, producing works that are often characterized by a number of innovations, such as attempts to correct the distortion in the axis of the Mediterranean, which clearly distinguish Oliva from his contemporaries.

From 1594 to 1615 another Oliva, Francesco, was at work in Messina; his ten or so extant works include a large chart of the Atlantic Ocean,[323] which was probably based on a Portuguese original. Two works bear the signature "Ioannes et Franciscus Oliva fratres,"[324] thus throwing more light on the complex web of family relationships within this dynasty of cartographers. Other members of the family at work in Messina include a Placido Oliva[325] and a Brasito Olivo, whose only extant traces are, respectively, a chart of 1615 and an atlas of 1633 (ItVe6).

From a quantitative point of view, cartography in seventeenth-century Messina was dominated by Placido Caloiro e Oliva, who has left us some thirty-odd works, mainly charts and three-sheet or four-sheet atlases, produced between 1617 and 1665.[326] Derived rather clumsily from antiquated models, these works rely less on cartographic information than on showy and ill-executed decoration. The area shown is always that of the Mediterranean, even if, following a practice introduced by Vesconte Maggiolo and occasionally adopted by Joan Riczo Oliva and Joan Oliva, there is a small western hemisphere given on the neck of the parchment (again using totally out-of-date geographical sources).[327] Given that this latter feature serves no navigational purposes, it is clear that these late maps were concerned merely with the presentation of basic geographical information for a public that made very modest scientific demands and was more interested in the cachet of possessing a richly decorated object that had clearly required time-consuming work by skilled craftsmen.

This was probably the period when Nicolò Romano was at work. His two extant charts, one of the Mediterranean Sea and the other of the Tyrrhenian Sea, were both produced in Messina and are dated 1576, but, given that the dates are written in over an erasure, and the works themselves are clearly in the style of the seventeenth century, it seems more than likely that they have been changed.

In Messina in 1673 Giovanni Battista Caloiro e Oliva signed his only known extant atlas. The following year came the revolt against Spanish rule, the ruthless repres-

318. Sebastiano Crinò, "Portolani manoscritti e carte da navigare compilati per la Marina Medicea, III.—Tre Atlanti di carte da navigare inediti conservati nella Biblioteca dell'Istituto di Fisica di Arcetri (Firenze)," *Rivista Marittima* 65 (supp. November 1932): 1–43, esp. 11–12.

319. Caraci, "Inedita Cartographica," 162–63.

320. Antonino Enrile, "Di un atlante nautico disegnato in Messina nel 1596 da Giovanni Oliva," *Bollettino della Società Geografica Italiana* 42 (1905): 64–75, and Grande, "Attorno ad una nuova carta nautica."

321. Caraci, "Cimeli cartografici sconosciuti esistenti a Firenze," 38–40.

322. One atlas bears the date 1582 (SpP5); but as the last three figures have definitely been written in different ink to that used in the rest of the inscription, it is highly likely that the date was falsified to make the piece appear older than it is.

323. Richard Arkway, Inc., New York, brochure, 1995; the map is in a private collection.

324. FrP32. Gabriel Marcel, "Sur un portulan de la fin du seizième siècle, par Jean Oliva, document appartenant aux collections de la Société," *Compte rendu des séances de la Société de géographie et de la Commission centrale,* 1885, 396–400, and Foncin, Destombes, and La Roncière, *Catalogue des cartes nautiques,* 101. The second was once in the Biblioteca Borromeo, Milan; see Errera, "Atlanti e carte nautiche," 525–26.

325. Placido Oliva should not be confused with Placido Caloiro e Oliva. Caraci, "Le carte nautiche del R. Istituto," 46–47, and Simonetta Conti, *Una carta nautica inedita di Placidus Caloiro et Oliva del 1657* (Rome: Università di Roma, Istituto di geografia dell'Università, 1978).

326. In fact, the last chart signed Placido Caloiro e Oliva dates from 1657, while the 1665 chart is simply signed Placido Caloiro; in this case there is no reason for ruling out that they might be the same person.

327. Simonetta Conti, "Una particolaritá delle carte nautiche 'Oliva,'" in *Esplorazioni geografiche e immagine del mondo nei secoli XV e XVI,* ed. Simonetta Ballo Alagna (Messina: Grafo Editor, 1994), 83–101.

sion of which severely undermined the port's economy and undoubtedly sounded the death knell for its already tottering cartography business.

As for sixteenth- and seventeenth-century cartographic output in the other centers linked with Messina, it was negligible. We know of only three charts produced in Palermo, and these seem to have been created due to the occasional presence of cartographers who were passing through: Banet Panades in 1556, Domenico Vigliarolo in 1577, and Bartomeu Olives (date unknown, but almost certainly before he settled in Messina in 1572).

Production in Malta was even more scanty: in 1574 an anonymous Majorcan cartographer produced a nautical chart on the island, and in 1611 Joan Oliva produced another[328] (probably during a short stay, given that this was a period when he seems to have been continually on the move). Hence, it seems likely that the Knights of Malta opted not to encourage the establishment of a local cartographic workshop, and their purchases elsewhere—Messina, in particular—served to stimulate the output of other local workshops.

LEGHORN

Under Duke Alessandro de' Medici, work began on the building of the Fortezza Vecchia, a project for the expansion and modernization of the port of Leghorn that would be continued by Grand Duke Cosimo I, neglected by Francesco, and then taken up again by Ferdinand I.[329] And it was this latter ruler who not only ordered the construction of the external port, capable of taking the largest ships of the day, but also passed legislation encouraging the immigration of skilled labor regardless of nationality.

Exceptional in a period when intolerance and religious persecution were the norm in Catholic and Protestant countries alike, these measures made a concrete contribution to the development and prosperity of Leghorn by attracting to the city Jewish bankers and merchants, English and Dutch pilots and captains, and master joiners and navigators from all over the Mediterranean. The guarantees of an undisturbed existence, together with the opportunities offered by the development of both the Tuscan mercantile fleet and the naval fleet of the Order of Santo Stefano, brought to the city such cartographers as Robert Dudley, Vincenzo Volcio, Joan Oliva, and Giovanni Battista Cavallini.

The navy of the grand duchy, made up mostly of galleys, had proved its ability to patrol the coast and protect local traffic from Barbary pirates, but it had encountered serious setbacks when taking part in more wide-ranging operations, and—even worse—the incompetence and cowardice of its commanding officers had often been undeniable.[330] Cosimo I therefore hit on the idea of founding a religious fraternity of knights who would be responsible for protecting the Mediterranean against Turks and Barbary pirates; thus, in 1561 the Holy Maritime Order of the Knights of Saint Stephen, Pope and Martyr, was established, to be officially consecrated the following year in a magnificent ceremony during which the grand duke himself was appointed *gran maestro*.

The pilots on the order's ships were proven professionals, and the knights themselves certainly did not take to sea unversed in the art of sailing or in the various shipping routes between the ports of the Mediterranean: their three-year training program at the Palazzo della Carovana involved a course of geography, which must have included cartography, and their theoretical lessons were amply backed up by frequent firsthand experience of the sea. Hence, it was probably due to the demand from the grand dukes, the Knights of Santo Stefano, and the merchant sailors of Tuscany that one or more cartographic workshops were set up in Leghorn during the late sixteenth century, a period when similar establishments in most other Mediterranean cities were going into decline.[331] A number of extant atlases and charts certainly belonged to the Knights of Santo Stefano and must have been used in theoretical lessons of geography and navigation, in plotting actual routes, in planning attacks on the ports and fortresses held by the Turks and Barbary pirates, or simply in the adornment of libraries.

As early as 1592, the Ragusa cartographer Vincenzo Volcio drew up a nautical chart in Leghorn, even though from the inscription in a three-sheet atlas we know that the following year he was at work in Naples. Further evidence shows that in 1595 he was in Portoferraio[332] and then, at least in the period 1598–1601, was again in Leghorn (where he produced four charts known to us) before returning to Naples (in the years 1606–7). His presence in Tuscany therefore seems to have been due to continual peregrinations from one Mediterranean port to another, and was in no way connected with the establishment of a permanent cartographic workshop.[333]

328. Caraci, "Le carte nautiche del R. Istituto"; idem, "Una carta nautica disegnata a Malta"; and Rey Pastor and García Camarero, *La cartografía mallorquina,* 141.

329. Dario Matteoni, *Livorno* (Rome: Laterza, 1985).

330. Cesare Ciano, *Santo Stefano per mare e per terra* (Pisa: ETS, 1985).

331. The work of the nonprolific Siena cartographer Giulio Petrucci does not seem to have been directly linked with the requirements of the Order of the Knights of Santo Stefano. He is known to have produced a chart, with an illegible date, in his home town of Siena (UKGr8) and three other maps in Pisa over the period 1570–71 (ItBo10, ItMo3, and The Map House, Cat. 1, 1988). Gino Bargagli Petrucci, "Le carte nautiche di Giulio Petrucci," *Bullettino Senese di Storia Patria* 13 (1906): 481–84.

332. Nautical chart of the Aegean, sold at auction by Christie's on 25 May 1990.

333. Mario Pinna, "Sulle carte nautiche prodotte a Livorno nei secoli XVI e XVII," *Rivista Geografica Italiana* 84 (1977): 279–314, and

The undated nautical chart signed by Giovanni Gerolamo Sosuich, maybe of Dalmatian origin, was probably drawn up around this time. Bearing no indication of where it was produced, the chart was perhaps owned by a knight of Santo Stefano.[334]

After this, there was a long period when chartmaking in Leghorn seems to have come to a halt, starting up again around 1616 with Joan Oliva. The date of his move is not certain; we know only that he remained in Marseilles into 1615 and in 1616 designed an atlas that bears no indication of place of production. The presence of certain blue decorative motifs with lilies might lead one to think of Marseilles, but this has been ruled out by Pinna, who argues that the decorative motifs could have been inspired by the Medici family emblem (the atlas does bear a dedication to the grand duke of Tuscany).[335] Therefore, it seems that the work marks the beginning of Oliva's period in Leghorn. Or one might argue that it was produced in Marseilles without indication of place or date because the cartographer intended to present it to a mighty patron, and that he added the dedication and decorative motifs only when the atlas was actually presented to the grand duke in 1616; this theory is supported by similarities of this chart to a 1614 Messina atlas. Whatever the truth, there seems no doubt that Oliva's arrival in Leghorn took place around 1616.

So, after years of wandering around the Mediterranean, Joan Oliva ultimately settled in the Tuscan port, where he opened a cartographic workshop that produced numerous works between 1618 and 1643, of which several are extant. There is also an atlas that bears the inscription "Giouanne Oliva in Lionri Año 1650" (ItPo1), which would mean that the cartographer's career should be extended a further seven years—which is hardly feasible when one thinks that his earliest known work dates from 1582. However, study of this atlas reveals that it consists of three rather crudely drawn sheets on paper, in a style that is only vaguely similar to that of Joan Oliva. By 1643, therefore, the cartographer must already have been of a grand old age. Nor should one forget that in 1636 he put his name to an atlas also signed by Giovanni Battista Cavallini, thus making a sort of official presentation of his successor (to whom he may at that moment have handed on responsibility for running the cartographic workshop in Leghorn).

Though we know Cavallini worked uninterrupted in Leghorn from 1635 to 1656, the man remains a mysterious figure. In the 1652 atlas "Il Teatro del Mondo Marittimo" he declares that he is Genoese and signs his name "Giouan Batta Cauallini Genovese Geografico," so one might surmise that it was the Maggiolo family's monopoly over the production of navigation charts, compasses, and hourglasses that drove him to abandon his native city and seek his fortune as a cartographer in Leghorn.

All in all, nineteen of Cavallini's signed works are extant, and all seem to have been produced in Leghorn (fig. 7.26). Only the last, a chart of 1656 now the property of the Società Geografica Italiana, does not bear an indication of the place of production, but there is no reason to suppose it was drawn up elsewhere. One should also remember that Crinò attributed an anonymous three-sheet atlas to Giovanni Battista Cavallini (ItFi8), even if Caraci produced valid arguments for doubting such an attribution and said the atlas should be considered sixteenth-century Catalan.[336] However, the atlas fragment USNY3 is probably by Cavallini. Comprising seven sheets showing the islands of the Mediterranean (Crete, Malta, Sicily, Sardinia, Corsica, Elba, and the Balearics) plus a world chart ("Tipus orbis terrarum"), it has maintained its original binding of parchment, with corner decorations only on the spine. The front cover is the torn right half of a map of the island of Rhodes on which one can read the name of one of its owners: Charles Edwards Lester, American consul in Genoa around the middle of the nineteenth century and a well-known collector of antique maps. When he came into possession of it, the first part, complete with inscription and date, must have already been missing, though we can assume that overall the atlas was very similar to one Cavallini produced in 1635 (the world maps are almost identical, and different from those in later atlases). All in all, even if totally reliant on the commissions and purchases of the Order of Santo Stefano, there is no doubt that the workshop under Cavallini continued to produce work of noteworthy quantity and quality.

In 1654, Giovanni Battista Cavallini followed the traditional method of indicating a successor by signing a three-chart atlas along with one Pietro Cavallini, who we may assume was his son (even if we have no evidence of the fact) (ItPr8). It is interesting to note that the correction of the axis of the Mediterranean, which had been a constant feature of Giovanni Battista's work, does not appear in this atlas, so one is inclined to attribute it to Pietro alone.

The extant work of this final exponent of the medieval art of making charts and signs for navigation totals seven signed atlases, all produced in Leghorn between 1665 and 1688. Perhaps "extant" is not the word to use here; what is probably Cavallini's finest work—a thirteen-sheet atlas of 1677 that was once in a private collection in Trieste—

Osvaldo Baldacci, "Le carte nautiche del raguseo Vincenzo Volcio di Demetrio," *Studi Livornesi* 3 (1988): 43–52.

334. ItPi2. Barsanti, "Le carte nautiche," 162–64.

335. Pinna, "Sulle carte," 287–89.

336. Crinò, "Tre Atlanti di carte da navigare," 35, and Caraci, "Gio. Batta," 380–88.

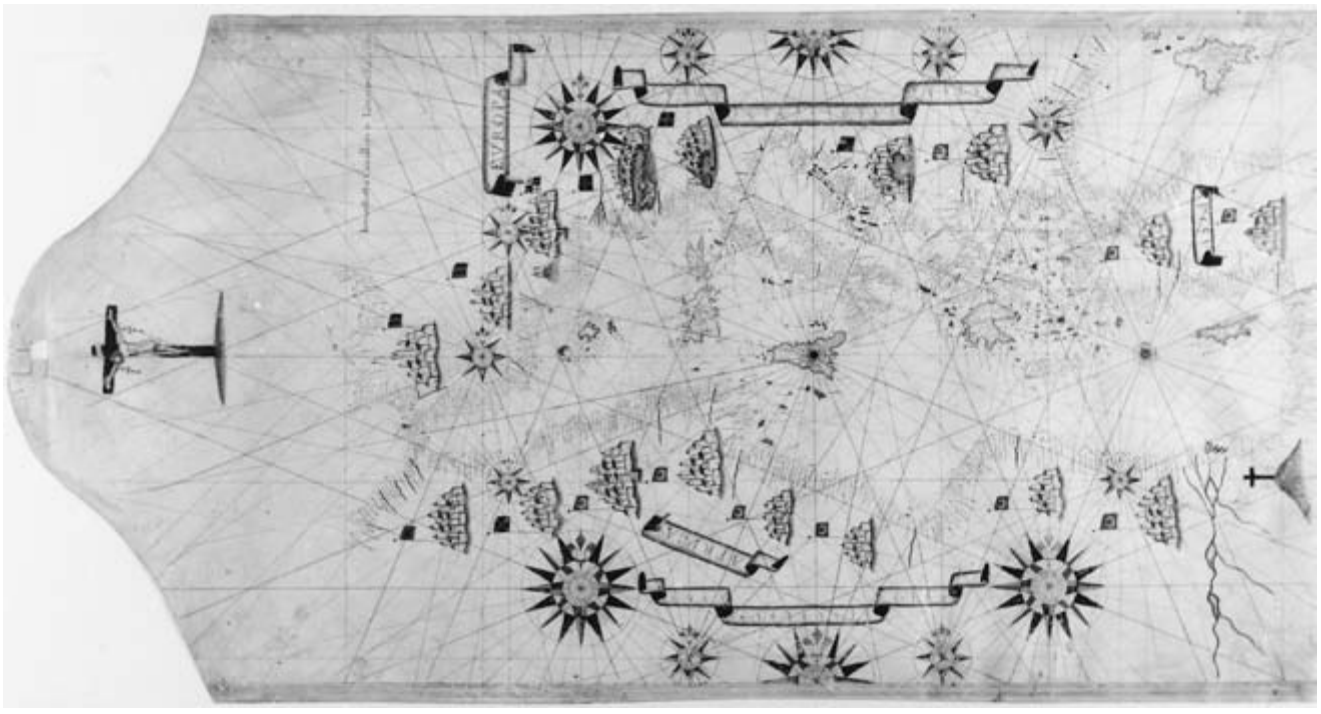

FIG. 7.26. NAUTICAL CHART OF THE MEDITERRANEAN BY GIOVANNI BATTISTA CAVALLINI. Leghorn, 1639. Size of the original: 47 × 92 cm. Photograph courtesy of the Società Ligure di Storia Patria, Genoa.

disappeared without a trace some time ago,[337] and we do not know the present whereabouts of a two-sheet atlas of 1676 that before the Second World War was in the collection of Commendatore Ernesto Bertollo in Genoa.[338]

To the five atlases still available one should also add a nautical chart signed "ill [*sic*] Cavallini in Liuorno / Anno 1678"; both style and year of production suggest that this is the work of Pietro rather than Giovanni Battista. However, I reject Guarnieri's attribution to Pietro of the anonymous eight-chart nautical atlas (ItFi37):[339] though predating 1670, as one can see from the dedication to Cosimo III, this is totally unlike Pietro's work in both coastline and decorative features.

Generally, this last of Giovanni Battista Cavallini's works is held up as an example of the sharp decline in a tradition of chartmaking that was over a century old. Caraci argues that no competent seaman would ever have used such crude works, filled with mistakes, in which he sees "sloppiness and imprecision in the tracing of the coastlines, distortion of even the least-accurate models available at the time, garbled and sometimes totally unrecognisable place-names, and frequent irrational transpositions." Even the decoration and coloring, which clearly took precedence over the charts' scientific content, are, according to the scholar, "vulgar and tasteless."[340]

And yet, just like his predecessor Giovanni Battista, Pietro does not seem to have had any difficulty in finding customers for his wares among the Knights of Santo Stefano, as one sees from the annotations on the atlases of 1676 and 1688. And this 1688 atlas, the latest of Pietro's extant works and perhaps the very last atlas produced in Leghorn, may well give the usual slipshod outline of Western Europe and even Italy, yet it contains a much more detailed account of the East and the Aegean, the site of the last naval campaigns involving the Knights of Santo Stefano (the defense of Candia, the war between the Turks and the Holy Roman Empire, and the campaign in the Peloponnesus).[341] The third sheet, showing the eastern Mediterranean, contains Pietro Cavallini's first known attempt to correct the traditional distortion of the sea's east-west axis by means of clockwise rotation (which he overdoes, and ends up showing Cyprus much farther south than Crete).

337. Roberto Almagià, "Note intorno alla della tradizione cartografia nautica a Livorno," *Rivista di Livorno* 5 (1958): 304–12.

338. Caraci, "Inedita Cartographica."

339. Giuseppe Gino Guarnieri, *Le correnti del pensiero geografico nell'antichità classica e il loro contributo alla cartografia nautica medioevale,* 2 vols. (Pisa: Gardini, 1968–69), 1:149.

340. Caraci, "Gio. Batta," 386.

341. Luciano Lenzi, "Le carte nautiche pisane dei Cavalieri di Santo Stefano: L'Atlante nautico di Piero Cavallini: Proposte di una nuova lettura," *Quaderni Stefaniani* 4, supp. (1985): 41–61.

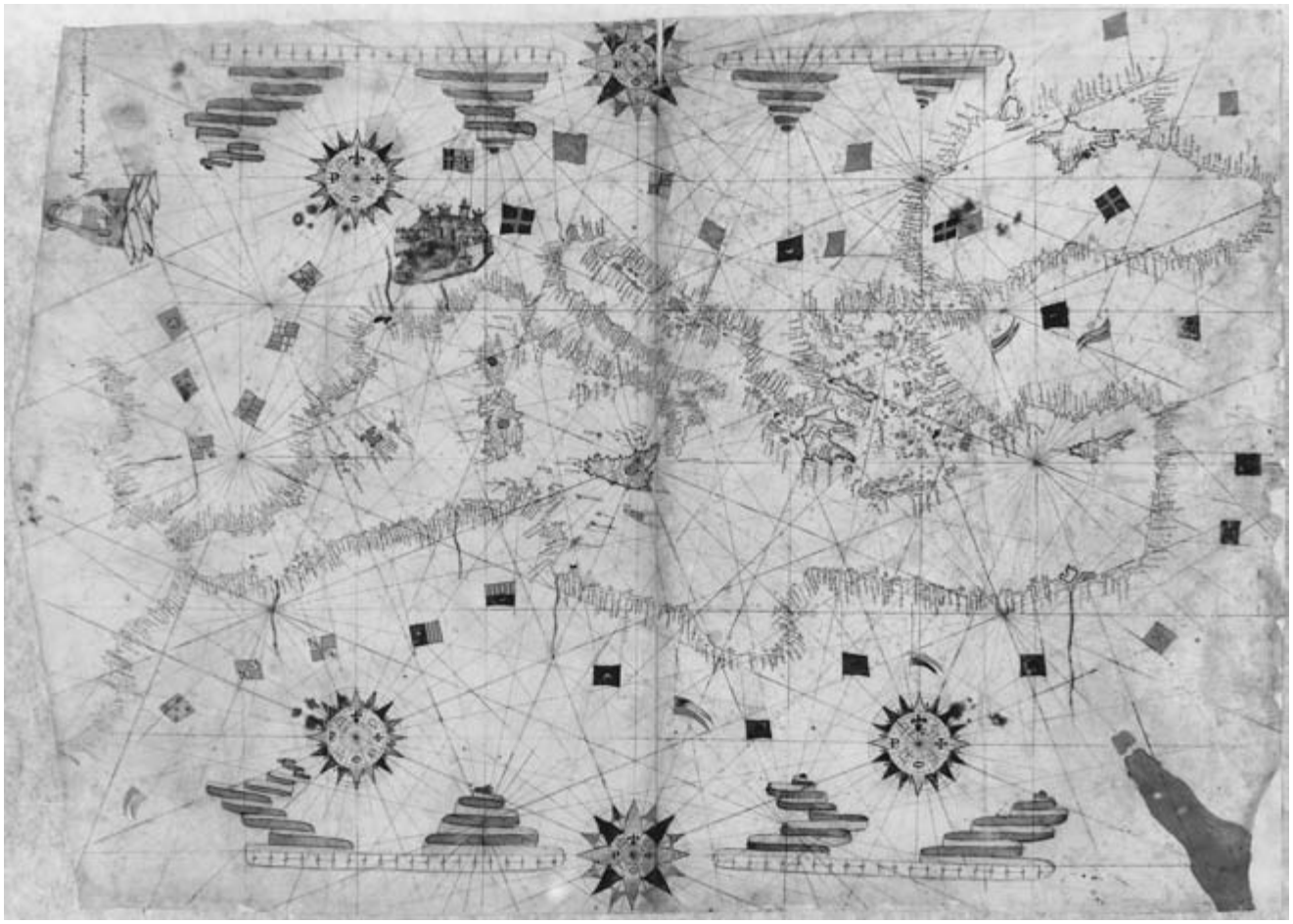

FIG. 7.27. NAUTICAL CHART OF THE MEDITERRANEAN BY "ANGELUS." Marseilles, 1571. Size of the original: 54 × 76 cm. Biblioteca Nazionale Centrale, Florence (Port. n. 6). By concession of the Ministero per i Beni e le Attività Culturali della Repubblica Italiana.

One should point out that Joan Oliva had introduced this correction in his post-1614 work, but that Giovanni Battista Cavallini had not incorporated it in his own until 1638, and, as we have seen, Pietro seems to have been aware of it only right at the end of his career. Hence, Caraci appears to be right when he argues that Leghorn never had a veritable school of cartography, with knowledge handed down from master to apprentice.[342] However, there is no denying that the city did have a specialized cartographic workshop whose fortunes were closely bounded up with those of the Knights of Santo Stefano and thus came to an end when that order went into irreversible decline.

MARSEILLES

The status of Marseilles as a port town, like that of Leghorn, increased greatly during the sixteenth century, largely due to trade with the East, and hence the city attracted professionals from the various other ports of the Mediterranean; among these were numerous cartographers who settled in Marseilles in the hope of finding a flourishing market for their wares.

Destombes mentions a 1539 collection of charts signed and dated by Giacomo a Lagna Trapani and Nicolas Iszoard as the first such collection produced in Marseilles, without giving information on its current location. According to Destombes, the next cartographic work to come out of Marseilles was a small 1568 atlas signed by Julianus Graffingnia.[343] Albanès gives an accurate description of this work comprising five charts, which together cover the area of the Mediterranean, and a world chart (perhaps of the Agnese type). The inscription on the recto of the first sheet is given as reading "Julianus Graffingnia conposuit hunc librum in nobbili civitati Massiliae. Anno Domini 1568," but we have no way of

342. Caraci, "Gio. Batta."
343. Destombes, "François Ollive," 13.

checking, because the manuscript seems to have disappeared some time ago.[344]

Hence the nautical chart signed "Angelus me fecit marssilia" (fig. 7.27) is of particular importance; it shows the Mediterranean coastline plus the Black Sea, the Atlantic coast of Europe (up to "c. finistera" in Galicia), and the coast of Africa (as far as "cauo ditto" in Morocco) (ItFi22). Destombes claims the existence of four atlases bearing the same inscription and all dating from 1571–74.[345] However, it has not been possible to trace these works, and we know nothing of "Angelus."

Cartography in Marseilles during this period seems to have depended largely on the Oliva family. One of the first members of this dynasty, Jaume Olives, was already at work in Marseilles in 1550, before moving on to Naples and Messina and then returning to the city again in 1566—ultimately passing on to Barcelona, where he produced his last works. Three charts bear witness to his presence in the French city; the first is inscribed "jaume Ollives mallorqui en marsela 1550 (USW2)," while the other two (USNY15 and ItVe42) are dated 1566.

The most prolific member of the family, Joan Oliva, went to Marseilles after working in Messina, Naples, and Malta; he remained there from 1612 to 1615, apart from a short stay in Messina in 1614,[346] and then ultimately moved on to settle in Leghorn. The extant works of his French period comprise two nautical charts and two atlases. The first chart bears the inscription "Joannes Oliva fecit in civitate Marseille 1612" (ItVe57), and was followed by a twelve-sheet atlas in 1613 (UKL37), a ten-sheet atlas in 1614 (ItNa4), and a nautical chart in 1615.[347]

The first member of the family who seems to have worked exclusively in Marseilles was Salvatore Oliva, who produced six atlases there in the period between 1619 and 1635. The earliest of these atlases in fact consists of two of his charts bound together with a much later chart signed by Estienne Bremond (USSM12 and USSM13); it bears the inscription "Salvator Oliva fecit in civitate marsiliae, Anno 1619." Thereafter came a seven-sheet (ItFi16) and a three-sheet (USCa1) atlas (both from 1620), then three three-sheet atlases—two from 1631 (ItVe18 and FrP40) and one from 1635 (FrP42).

One four-sheet atlas bears the signature "Franciscus Caloiro Oliva me fecit in civitate marsiliae anno domine 1643" (UKL43). The four charts show the Adriatic, the Aegean, the Atlantic coasts of Europe and Africa (from Scotland to Morocco) together with the western Mediterranean, and the central and eastern sections of the Mediterranean. Rather inaccurate from a geographical point of view, the charts are full of floral-type decorations (with the colors green and orange predominating), and the fourth chart also includes a large view of Marseilles. While the works listed so far were in no way different from the output of the cartographers in Majorca or Messina, this atlas is the first extant example illustrating what would be the particular features of nautical cartography in Marseilles. Given the stylistic similarities, one might identify the cartographer as the François Ollive (Francesco Oliva) who was active in Marseilles from 1650 onward (who is not to be confused with the Francesco Oliva who worked in Messina from 1594 to 1615).

The oldest extant work by François Ollive of Marseilles is a five-sheet atlas that bears the inscription "Franciscus Oliva me fecit in civitate Marsiliae anno 1650" (UKL46). In the same year he produced a three-sheet atlas (UKE2), while two years later he drew up the three nautical charts that are today bound together in a single atlas with nine charts by Jean François Roussin (ItTr2 and ItTr3). There followed a five-sheet atlas dated 1658 (SpBa8), a four-sheet atlas (SpBi2) and a three-sheet atlas (FrMa3), both from 1661.[348] There is also a small two-sheet atlas dated 1659 and simply signed with the initials F. O. (ItVe8), which should undoubtedly be attributed to the same cartographer.

The works from the later part of the cartographer's life, when he began to sign himself "François Ollive,"[349] including the two 1662 charts (FrP48 and FrP50) and a 1664 chart (plate 8, FrP61), are all richly decorated with coats of arms, ships, animals, knights, monarchs, and city views framed in rectangular scrollwork. It should also be pointed out that in these later works the east-west axis of the Mediterranean has been corrected and Gibraltar, Crete, and Cyprus are almost aligned with each other—a sure sign that François Ollive took pains to keep his work up to date. There are also a surprising number of anonymous charts and atlases that bear striking stylistic similarities to Ollive's work. This suggests that his Marseilles workshop was unflaggingly productive, with charts often the work of apprentices.

During the same period, two member of the Roussin family, Augustin and Jean François, were at work in the

344. Albanès, *Catalogue général,* 317.

345. Destombes, "François Ollive," 13.

346. In that same year, in fact, Joan Oliva produced and signed a fifteen-sheet atlas in Messina (SpP6).

347. Privately owned and conserved in a collection in the United States.

348. R. D. O. [Oldham], "Francesco Oliva the Younger," *Geographical Journal* 77 (1931): 204–5, and Dominique Jacobi, ed., *Itinéraires de France en Tunisie du XVI^e^ au XIX^e^ siècle* (Marseille: Bibliothèque Municipale, 1995), 128–33.

349. To these one might add the large map in three sheets found in an old house in the Sarthe. The badly damaged inscription has been transcribed as "Faict par moy François Ollive: Géographe de la Ville de Marseille en novembre 1646." Not having been able to examine the work myself, I will simply put forward the suggestion that the map could date from much later—perhaps as late as 1664. It seems strange that in 1646 the cartographer should have signed himself as François Ollive, then use Franciscus Oliva from 1650 to 1661, and finally returned to François Ollive in 1662.

city. Although we do not know the exact relation between them, we do know that Augustin was the older of the two and was already at work in 1630, the year in which he produced a three-sheet atlas signed "Augustinus Roussinus me fecit marsciliae anno Domini 1630" and containing charts covering the Mediterranean, the Aegean, and the western Mediterranean plus the Atlantic coasts of Europe and Africa (FrMa2). A very similar atlas, sold at auction by Christie's on 20 June 1990, dates from the same year, and two other three-sheet atlases were produced in 1633 (FrP41 and FrT1). There are also two signed but undated works: a three-sheet atlas (FiH6) and a six-sheet atlas (USB1), which is not limited to the area of the Mediterranean but also covers the Americas, all of Europe, and the west and east coasts of Africa (complete with Madagascar).[350]

There is also a three-sheet atlas signed "Faict à Toullon par Roussin 1645"[351] and a large nautical chart of the Mediterranean signed "faict . . . Toullon p / Roussin / 1654" (FrP59). It is difficult to establish whether these are by Augustin or by his successor Jean François, who was active between 1654 and 1680 and is known to have been in Toulon from 1654 to 1658. The two works might be by Augustin, who, toward the end of his career, could have moved to Toulon, where his relation Jean François could have taken over from him. However, it seems to me more likely that these are early works by Jean François himself, who may well have decided to set up his own workshop in a port where there was no competition and then deliberately signed himself using only his surname because he wanted his work to be mistaken for that of the better-known Augustin.

The earliest extant work that can definitely be attributed to the later Roussin is a four-sheet atlas (ItMo4); the upper right corner of the third sheet bears the inscription "Faict a Toullon Par J.F. Roussin / 1658," and in the upper left corner there is a large realistic view of Toulon itself (the only such miniature in the entire atlas). The work has a curious feature that is also to be found in some other contemporary atlases, with the same area,[352] in this case the Mediterranean, shown in two different ways: there is a traditional chart, complete with the network of wind rhumbs and elaborate decoration (including large compass roses), and a more spartan version, without ornamentation—except for three banderoles with the names of the continents—and with a grid replacing the wind lines. The purpose of this second chart is not clear, because the horizontal and vertical lines forming the grid do not correspond to lines of longitude and latitude and are not labeled in any way.

Jean François Roussin's subsequent career fits in with the contemporary pattern of the wandering cartographer. First he moved to Marseilles, where in 1568 he completed a four-sheet atlas (ItTr2) and in 1569 a three-sheet atlas (FrP46). In 1661 we find him in Venice, where he would stay until 1673, leaving a total of six signed charts and atlases. In 1674 he was back in Toulon, where he drew up a nautical chart (FrP47), and then in 1680 he was in Marseilles, where he completed his last extant work, a nautical chart that may be attributed to him with reasonable confidence even if it is simply signed "A marseille Par Roussin 1680" (SvS5).

Another family of Marseilles cartographers were the Bremonds. The oldest member of the family, Estienne, is known to us only through two nautical charts of the Aegean, UKC2 and USSM13, the latter signed "Faict a Marseille par Estienne Bremond 1655" and subsequently bound together with two 1619 charts by Salvatore Oliva (USSM12). There are other examples of such composite atlases, for example, that formed of nine charts drawn up in Venice by Jean François Roussin in 1664 and that formed of three charts drawn up in Marseilles by François Ollive (ItTr3 and ItTr4), but in each case I would argue that the compilation was the work of the owner of the individual charts and not that of the cartographic workshop. Jean André Bremond is known to us through two five-sheet atlases dated 1669 (ItTs2) and 1670 (USW10), but there is also a two-sheet atlas of 1662 (ItMi4) and a single chart of 1664 (FrP60), both signed simply "Bremond," which may be attributed to him.

Like the Oliva-Ollive and the Roussin families, the Bremond family members were certainly professional cartographers and probably worked in well-equipped workshops situated near the port. Indeed, unlike Genoa, where the Maggiolo monopoly forced other chartmakers out of the market, Marseilles seems to have had such a healthy appetite for these valuable artifacts that there were a number of independent artisans, perhaps ships' pilots and captains, who drew up charts in their spare time. Many of these figures are known to us through a single extant work.

The nine-sheet atlas signed (in Italian) "I, Hercules o Doria, sailor, made this said book in Marseilles in the year 1592 on the twentieth day of November" is particularly interesting (USPo4). Given that the inscription and the name of the chartmaker are more than slightly puzzling, I think it is worth recalling an interesting theory put forward in 1967 by Jeannette Black, then map curator at the John Carter Brown Library at Providence.[353] The

350. USB1. E. H. [Edward Heawood], "An Unplaced Atlas of Augustin Roussin," *Geographical Journal* 77 (1931): 160–61.

351. UKL50. "The Roussins as Chart-Makers," *Geographical Journal* 77 (1931): 398.

352. As in the five-sheet atlas produced by François Ollive in 1658 (SpBa8) and the anonymous five-sheet atlas (FrMa4); in these works the sheets with grids bear no place-names.

353. Jeannette Black, "Interim Report on the Doran / O'Doria Portolan Charts and Atlas" (unpublished manuscript, dated 1967).

scholar, who sadly died some years ago, mentions the presence in the Sterling Memorial Library at Yale of a chart inscribed (in Italian) "By me, Edmund Doran, Irishman, in the year 1586 on the thirteenth day of June in the city of London" and of another chart in the collection of the Marquis of Salisbury inscribed (also in Italian) "Made by me, Hercules Doran, Italian, son of Edmund Doran, Irishman, on the twenty-second day of March 1586 in the city of London." So the theory is that Doran father and son both worked in London, and then the son Hercules moved to Marseilles, where he changed his surname to Doria (which was undoubtedly a rather better-known name in Mediterranean shipping circles). What remains strange is that the inscriptions in all three works—the two produced in London and the one in Marseilles—are in Italian. Another unique work is the five-sheet atlas signed "A Marseille par Charlat Ambrosin l'an 1620," but we know nothing about the cartographer (FrP37).

In his work on the nautical charts in Milan libraries, Errera mentions another work then in the Biblioteca Trivulziana that bears the simple signature "1623. Pierre Bernard," and, after pointing out the stylistic similarities to the work of Joan Oliva, he suggests that the author was one of the master cartographer's apprentices in Marseilles.[354]

There is also a six-sheet atlas produced in Marseilles in 1642 by Pierre Collin of Saint Malo (FrL1), who is a slightly less shadowy figure; we know that he ultimately returned to Brittany and, in 1665, accompanied Charles Colbert on his tour of inspection along the coast of the English Channel, then the following year drew up a large-scale chart of the island of Bréhat.[355]

Other singular works are the two-sheet atlas (ItBo7) signed "faict A Marseille Par Tropheme Vernier. Anne Domini 1679"[356] and a nautical chart that bears a damaged and partially illegible signature including the phrase "a Marseille . . . T. Caulet" (the work must date from the middle of the seventeenth century) (SwS1).

A number of charts and two- or three-sheet atlases covering only the Mediterranean area may with some certainty be attributed to Marseilles chartmakers, even though they bear no indication of the date or place of their production.[357] Such works can be found in public and private museums and libraries, as well as appearing with a certain regularity in auction rooms or on the shelves of antique booksellers, yet very often they are simply labeled as Catalan.

It appears that the main customers for these last products of the manuscript cartographers of Provence were rich merchants and shipowners, and this would explain why the market developed around Marseilles rather than Toulon. The charts produced in Leghorn for the Knights of Santo Stefano were used in planning raids against Barbary pirates, while these richly decorated charts enabled their owners to trace the course of their merchandise and shipping en route to the far-flung ports of the Mediterranean. As mentioned earlier, it was this sole use of nautical charts in Leghorn that meant that after the decline of the order of knights the city's cartography trade went into recession rather than branching out into new products.

In Marseilles, on the other hand, the decline in the demand for manuscript nautical charts was concomitant with the birth of modern French hydrography. In 1680 Jean-Baptiste Colbert would order systematic surveys of the coasts of Spain, Catalonia, and Provence;[358] and around the same time Henry Michelot would begin printing written *portolani* and working with Jean André Bremond on the production and sale of printed nautical charts of the Mediterranean, which were based not on traditional models but on more up-to-date astronomical observations. Jean André's work would be continued by Laurent Bremond, who was undoubtedly a relation and, in the early decades of the eighteenth century, was selling printed nautical charts "on the port at Reboul's corner," probably on the very same premises where Estienne and Jean André had first set up shop—a perfect symbol of the continuity of development in the city's cartography trade.[359]

Conclusions

The history of nautical cartography in the Mediterranean during the sixteenth and seventeenth centuries can, therefore, be described as that of a long twilight punctuated

354. Errera, "Atlanti e carte nautiche," 526.

355. Now in the BNF. Mollat and La Roncière, *Les Portulans,* 266.

356. Pietro Frabetti, "Descrizione ed illustrazione di due atlanti nautici manoscritti francesi del secolo XVII conservati presso la Biblioteca Comunale dell'Archiginnasio," *L'Archiginnasio* 82 (1987): 77–91, esp. 78.

357. For example, the anonymous five-sheet atlas USCh17 that contains not only four charts of parts of the Mediterranean at different scales but also a large-scale land and nautical chart of Sicily complete with the following inscription: "The year one thousand two hundred eighty-two were The Sicilian Vespers when the French were killed and they gave themselves to the King of Aragon." The presence of a large view of Marseilles in the final chart, showing the Golfe du Lion, is further proof that the atlas must have been produced in that city. The maps are drawn on different-sized sheets of parchment that have then been stuck onto cardboard and bound in a single volume. However, this should not lead one to think that the assembly was the work of the maps' owner—perhaps many years later. In fact, a similar atlas—with only four maps, but including an identical map of Sicily—was in 1936 part of the collection of Gerolamo Bollo, where it was accurately studied and described by Caraci ("Inedita Cartographica," 167–69), who speaks of the "author" in the singular. That work seems to have subsequently been broken up for sale as separate pieces.

358. Destombes, "François Ollive," 16.

359. Laurent Bremond, *Nouvelle carte generalle de la Mer Mediterranée . . . sur le Port a Marseille au Coin de Reboul, 1725* (Marseille: Laurent Bremond, 1726).

with many flashes of brilliance. There is clearly something surprising about this staying power and vitality in a situation in which printed charts were increasingly available and manuscript cartographers generally showed themselves unable to adapt to the new needs of sailors and the changing conditions of the market. Paradoxically, one can argue that the survival of a nautical cartography based on wind rhumbs was largely due to the fact that such charts gradually lost any practical purpose as navigational aids and took on a number of secondary decorative and didactic functions as geographical images.

However, the main function of these charts was not totally forgotten, as, even when the majority of those buying them could no longer be described as sailors, the places of production for nautical charts and atlases continued to be the main ports of the Mediterranean. Perhaps the name of the city of provenance was so scrupulously indicated because possible purchasers took it as an even greater guarantee of quality than the name of the cartographer.

The decorative purpose of these charts meant that cartographers increased the number of ornamental figures, and this, in spite of the consequent decline in quality, increased the time required for production and hence raised costs. Eventually there would simply be no more customers for such expensive manuscript charts, which would then disappear.[360]

The use of these charts as providers of geographical information was particularly important during the sixteenth century. The small-scale world charts and atlases by Vesconte Maggiolo and the atlases by the likes of Battista Agnese and Giorgio Sideri were clearly intended as means of conveying geographical knowledge and not as navigational tools. However, the distance of the centers of production from the cities where the new voyages of exploration were organized and their discoveries cataloged—plus the fact that the great powers often treated such discoveries as state secrets—finally meant that the flow of new information, the very lifeblood of cartography, dried up altogether.

Vesconte Maggiolo was undoubtedly the best informed of all sixteenth-century cartographers, perhaps due to the good relations between Genoa and Spain, but his work does not reveal a process of continual and rapid updating (there were also long periods in which it stagnated and even regressed).[361] One gets the impression that the cartographer's access to information on the newest discoveries was occasional and fortuitous and certainly not extensive enough for him to do the necessary cross-checking; hence the perpetuation of certain errors and even the return to ideas that were clearly out of date.[362] The plates in Battista Agnese's atlases lagged even further behind the times,[363] and in the second half of the century Giorgio Sideri was obliged to resort to contemporary printed maps for his information, often using such sources extensively and uncritically. Seventeenth-century cartographers such as Joan Oliva and Giovanni Battista Cavallini, who continued to produce atlases of the world or insert a small world map in their charts of the Mediterranean, would consistently use geographical information that was three or four decades out of date.[364]

As for these charts' depiction of the Mediterranean itself, over time they centered more and more on the sea, yet not only was there no real increase in precision; there was an actual drop in standards, with late works tracing coastlines in a crude and rather inaccurate way.

Bartolomeo Crescenzio, Giovanni Francesco Monno, and to some extent Francesco Levanto each made an attempt to guarantee the survival of manuscript nautical charts as tools for teaching the art of navigation to an elite made up of aristocrats. However, though they corrected the axis of their charts, aligning them with true north and thus making them compatible with the techniques of astronomical navigation then being used throughout the oceans of the world, their attempts met with only modest success.

The manuscript nautical charts produced in the ports of the Mediterranean had failed to move with the times. And even the timid attempts in Venice, Rome, and Genoa to produce printed versions of these traditional products did not have the hoped-for result of increasing sales by cutting costs. In effect, such charts were destined to be replaced not by a single rival but by a number of different products, among which the various functions of the manuscript chart were divided. As an instrument for navigation or the teaching of navigation, they were replaced by printed nautical charts and atlases based on geographical

360. C. Koeman, "The Chart Trade in Europe from Its Origin to Modern Times," *Terrae Incognitae* 12 (1980): 49–64, esp. 50.

361. Caraci speaks of "fluctuations and contrasts that show how the variations in his work in no way reflect what we know of the various stages in the development of cartographical knowledge over the course of the sixteenth century" (Caraci, "Vesconte Maggiolo (1511–1549) e il Nuovo Mondo," 287).

362. The world chart held to date from 1504 already reflects the results of Vespucci's Portuguese voyage, whereas that of 1516 does not contain any further step forward. The fanciful "Isthmus of Giovanni da Verrazzano" makes its appearance in the 1527 world chart, which comes two years before that drawn up by the brother of the discoverer himself, and Maggiolo would continue to follow the erroneous version to the end of his days. The discovery of the Amazon River (Rio delle Amazzoni) was also promptly documented in the 1548 atlas.

363. Revelli, *Cristoforo Colombo,* 2: 405.

364. Giovanni Battista Cavallini shows Le Maire Strait between Terra del Fuego and Terra Australe Incognita for the first time in his 1652 atlas, when the insular nature of the Isla de los Estados had already been established. In the same work, the chart of North America gets over the problem posed by the configuration of California by simply depicting it twice—once as a peninsula, once as an island.

coordinates (which were generally produced outside the Mediterranean area by government agencies or private entrepreneurs), and as ornamental objects or the means for conveying geographical knowledge, they were replaced by large printed maps and atlases that, once again, were produced outside the Mediterranean area. By the end of the seventeenth century, a four hundred-year-old tradition of manuscript nautical charts had come to an end, and all the small workshops turning out these craft products had disappeared.

appendix 7.1 Charts of the Mediterranean in Public Collections, 1500–1700

This preliminary list gives each manuscript chart and atlas an identifier based on the country and city where it is now held. For example, ItFi7 is number seven of the items preserved in Florence, Italy. The appendix includes the country, the name of the holding institution, the identifier, the author (when known), whether it is a chart (C) or an atlas (A) and the number of sheets containing charts, the place of production, the date (if known), and the call number.

AUSTRIA					
Vienna, Österreichische Nationalbibliothek					
AW1.	[Battista Agnese]	A12[1]	[Venice]	[16th cent.]	Cod. Ser. n. 1630
AW2.	Battista Agnese	A12	[Venice]	[16th cent.]	Cod. 623
AW3.	[Battista Agnese]	A24	[Venice]	[16th cent.]	Cod. Ser. n. 12.879
AW4.	Giovanni Antonio Maggiolo	C	[Genoa]	1565	Cod. Ser. n. 2.665
AW5.	Joan Martines	C	Messina	1570	Cod. 365
AW6.	[Francesco Ghisolfi]	A9	?	[16th cent.]	Cod. 12.925
AW7.	[Antonio Millo]	C	[Venice]	[16th cent.]	K III 108.652
AW8.	Francesco Oliva	A6	Messina	1614	Cod. 360
AW9.	Filippo Francini	A7	[Venice]	1699	Cod. Ser. n. 12.685
BELGIUM					
Brussels, Royal Library of Belgium					
BB1.	Bartomeu Olives	A4	Messina	1572	Manuscrit II 4622
BB2.	Angelo Freducci	C	Ancona	1547	II 292 CP
BB3.	Anonymous	C[2]	[Venice]	[16th cent.]	MS. 17874
CANADA					
Montreal, Musée David M. Stewart					
CaM1.	Vesconte Maggiolo	C	Genoa	1528	
CROATIA					
Dubrovnik, Muzej Dubrovačkog Pomorstva					
CrD1.	Placido Caloiro e Oliva	A4	Messina	1649	MDP 154
Zagreb, Hrvatski Državni Arhiv					
CrZ1.	Anonymous[3]	A7	?	[16th cent.]	DXVI-6
CYPRUS					
Nicosia, Bank of Cyprus Cultural Foundation					
CyN1.	[Joan Oliva]	A1[4]	?	[17th cent.]	
CZECH REPUBLIC					
Olomouc, Státní Vědecká Knihovna (State Resarch Library)					
CeO1.	Joan Oliva	C	Leghorn	1624	MV 51789
CeO2.	Joan Oliva	C	Leghorn	1624	MV 51799
CeO3.	Jaume Olives	A6	Naples	1563	II 33
DENMARK					
Copenhagen, Kongelige Bibliotek					
DK1.	Joan Oliva	C	Messina	[16th cent. ?]	

1. Called the Ambraser Atlas.
2. Nautical chart of the Adriatic inserted in a manuscript copy of the *Isolario* by Bartolomeo dalli Sonetti.
3. Attributed by the curator, Ankica Pandzic, to Diogo Homem, Venice, ca. 1570.
4. Loose nautical-terrestrial map of Cyprus from an atlas sold by W. Graham Arader III in 1985.

APPENDIX 7.1 (*continued*)

Helsingør, Handelds- og Søfartsmuseet på Kronborg					
DH1.	[François Ollive ?]	C	[Marseilles ?]	[17th cent.]	
DH2.	Anonymous (Catalan)	A2	?	[17th cent.]	
FINLAND					
Helsinki, Helsingin Yliopiston Kirjasto, Slaavilainen Kirjasto—A. E. Nordenskiöld Kokoelmaa[5]					
FiH1.	Domingo Olives	C	Naples	1568	
FiH2.	Vincenzo Volcio	A3	Naples	1593	
FiH3.	Bartolomeo Crescenzio	C	Rome	1596	
FiH4.	Anonymous	C	?	[16th cent.]	
FiH5.	Giovanni Battista Cavallini	A3	Leghorn	1642	
FiH6.	Augustin Roussin	A3	Marseilles	[17th cent.]	
FRANCE					
Chantilly, Musée et Château de Chantilly (Musée Condé)					
FrC1.	[Battista Agnese]	A10[6]	[Venice]	[16th cent.]	700 (1602)
Dijon, Bibliothèque Municipale					
FrD1.	Anonymous	C	?	[16th cent.]	MS. 550
Le Havre, Bibliothèque Municipale					
FrH1.	[Bartomeu Olives ?]	A13	?	[16th cent.]	MS. 243
Lyons, Bibliothèque Municipale					
FrL1.	Pierre Collin	A6	Marseilles	1642	
Marseilles, Bibliothèque Municipale Saint-Charles					
FrMa1.	Joan [Riczo ?] Oliva	C	Messina	1593	MS. 2081
FrMa2.	Augustin Roussin	A3	Marseilles	1630	MS. 2100
FrMa3.	François Ollive	A3	Marseilles	1661	MSS. 1663–1665
FrMa4.	[François Ollive]	A5	[Marseilles ?]	[17th cent.]	MS. 2104
FrMa5.	Jean François Roussin	A4	Venice	1660	
Montpellier, Bibliothèque Interuniversitaire, Section Medecine					
FrMo1.	[Battista Agnese]	A17	[Venice]	[16th cent.]	H.70
Nice, Archives Départementales des Alpes Maritimes					
FrN1.	Baldassare Maggiolo	C	Genoa	1589	
Paris, Bibliothèque de l'Arsenal					
FrP1.	Joan Martines	A10	Messina	1582	MS. 8323
Paris, Bibliothèque Nationale de France					
FrP1bis.	Anonymous[7]	C	?	[15th/16th cent.]	Rés. Ge AA 562
FrP2.	Nicolò de Caverio	C	[Genoa]	[16th cent.]	S. H. Archives n°1
FrP3.	Anonymous	C[8]	[Genoa ?]	[16th cent.]	Rés. Ge D 7898
FrP4.	Anonymous	C[9]	[Genoa ?]	[16th cent.]	Rés. Ge AA 567
FrP5.	P. R. [Pietro Russo]	C	Genoa	1511	Rés. Ge B 2126

5. These charts and atlases are described in A. E. Nordenskiöld, *Periplus: An Essay on the Early History of Charts and Sailing-Directions*, trans. Francis A. Bather (Stockholm: P. A. Norstedt & Söner, 1897); their presence in the library has been confirmed by the librarian, Cecilia Riska.

6. Atlas known as "Portulan de l'Amiral Coligny."

7. Called "di Colombo."

8. Nautical chart of the central Mediterranean.

9. Nautical chart of the Aegean.

APPENDIX 7.1 (*continued*)

FrP6.	[Pietro Russo]	C	?	[16th cent.]	Rés. Ge B 1425
FrP7.	Battista Agnese	A10	Venice	1543	Rés. Ge FF 14410
FrP8.	[Battista Agnese]	C	[Venice]	[16th cent.]	Rés. Ge B 1134
FrP9.	[Battista Agnese]	C	[Venice]	[16th cent.]	Rés. Ge B 9945
FrP10.	[Battista Agnese]	C	[Venice]	[16th cent.]	Rés. Ge B 2131
FrP11.	[Battista Agnese]	A10	[Venice]	[16th cent.]	MS. Latin 18249
FrP12.	Vesconte Maggiolo	C	Genoa	1547	Rés. Ge C 5084
FrP13.	[Jacopo Maggiolo]	C	[Genoa]	[16th cent.]	Rés. Ge D 7897
FrP14.	Jacopo Maggiolo	C	Genoa	1563	S. G. Y 1704
FrP15.	Giorgio Sideri (Il Callapoda)	C	[Venice]	1565	Rés. Ge D 4497
FrP16.	Diogo Homem	A7	Venice	1572	MS. Portugais 45
FrP17.	Jacopo Maggiolo	C	Genoa	1573	Rés. Ge B 2136
FrP18.	Diogo Homem	A7	Venice	1574	Rés. Ge DD 2006
FrP19.	Joan Martines	A7	Messina	1583	Rés. Ge DD 682
FrP20.	[Francesco Ghisolfi]	A10	?	[16th cent.]	Rés. Ge FF 14411
FrP21.	[Joan Martines]	A4	[Messina]	[16th cent.]	Rés. Ge FF 16119
FrP22.	Bartomeu Olives	C	Messina	1584	Rés. Ge B 1133
FrP23.	Matteo Prunes	C	Palma de Mallorca	1586	Rés. Ge AA 570
FrP24.	Matteo Prunes	C	Palma de Mallorca	1588	Rés. Ge C 5094
FrP25.	Domingo Villaroel (Domenico Vigliarolo)	C	Naples	1589	Rés. Ge B 1149
FrP26.	Baldassare Maggiolo	C	Genoa	1592	Rés. Ge C 24091
FrP27.	Joan Riczo Oliva	C	Messina	[16th cent.]	Rés. Ge C 5095
FrP28.	Vincenzo Volcio	C	Leghorn	1598	Rés. Ge C 5095
FrP29.	Joan Oliva	C	Messina	[16th cent. ?]	S. G. Y 1705
FrP29bis.	Anonymous	A7	[Venice ?]	[16th cent. ?]	Rés. Ge EE 5610
FrP30.	[Salvatore Oliva ?]	C	?	[17th cent.]	Rés. Ge D 7884
FrP31.	Francesco Oliva	C	Messina	1603	Rés. Ge C 5093
FrP32.	Joan Oliva and Francesco Oliva	C	Messina	[17th cent.]	Rés. Ge C 5101
FrP33.	[Joan Oliva and Francesco Oliva]	C	[Messina]	[17th cent.]	Rés. Ge C 5092
FrP34.	[Joan Oliva]	C	?	[17th cent.]	Rés. Ge C 5085
FrP35.	[Joan Oliva]	C[10]	?	[17th cent.]	Rés. Ge C 9131
FrP36.	Nicolaus Vourdopolos	C	?	[17th cent.]	MS. suppl. Grec 1094
FrP37.	Charlat Ambrosin	A5	Marseilles	1620	Rés. Ge DD 2018
FrP38.	Alvise Gramolin	C[11]	Venice ?	1622	Rés. Ge B 550
FrP39.	Placido Caloiro e Oliva	C	Messina	1631	Rés. Ge C 5098
FrP40.	Salvatore Oliva	A3	Marseilles	1631	Rés. Ge D 7885/6/7
FrP41.	Augustin Roussin	A3	Marseilles	1633	MS. Français 20122
FrP42.	Salvatore Oliva	A3	Marseilles	1635	Rés. Ge D 7889/90/91
FrP43.	[Salvatore Oliva]	A3	[Marseilles]	[17th cent.]	Rés. Ge DD 2007
FrP44.	Giovanni Battista Cavallini	A2	Leghorn	1639	Rés. Ge DD 2019
FrP45.	Juan Bautista Prunes	C	Palma de Mallorca	1649	Rés. Ge C 4616

10. Nautical chart of the Aegean.
11. Nautical chart of the Aegean.

APPENDIX 7.1 (*continued*)

FrP46.	Jean François Roussin	A3	Marseilles	1659	Rés. Ge DD 2022
FrP47.	Jean François Roussin	C	Toulon	1674	S.H. Archives n°44
FrP48.	François Ollive	C	Marseilles	1662	S.H. Archives n°43
FrP49.	Jean François Roussin	A2	Venice	1669	Rés. Ge D 7893 (Ie II)
FrP50.	François Ollive	C	Marseilles	1662	Rés. Ge A 850
FrP51.	[François Ollive]	A3	[Marseilles]	[17th cent.]	Rés. Ge FF 3596
FrP52.	[François Ollive]	A4	[Marseilles]	[17th cent.]	Rés. Ge DD 2009
FrP53.	[François Ollive]	A2	[Marseilles]	[17th cent.]	Rés. Ge DD 2010
FrP54.	[François Ollive]	A2	[Marseilles]	[17th cent.]	Rés. Ge DD 2012
FrP55.	[François Ollive]	C[12]	[Marseilles]	[17th cent.]	Rés. Ge D 6589
FrP56.	Anonymous	A2	[Marseilles]	[17th cent.]	Rés. Ge DD 1008
FrP57.	Anonymous	A6	[Marseilles]	[17th cent.]	Rés. Ge DD 2016
Paris, Musée National de la Marine					
FrP58.	Vesconte Maggiolo	C	Genoa	1537	9 NA 24
FrP59.	[Jean François ?] Roussin	C	Toulon	1654	9 NA 25
FrP60.	[Jean André ?] Bremond	C	Marseilles	1664	9 NA 26
FrP61.	François Ollive	C	Marseilles	1664	9 NA 23
Toulouse, Bibliothèque Municipale					
FrT1.	Augustin Roussin	A3	Marseilles	1633	MS. 784
Valenciennes, Bibliothèque Municipale					
FrV1.	Jaume Olives	A9	Barcelona	1572	MS. 488
GERMANY					
Berlin, Staatsbibliothek zu Berlin Preußischer Kulturbesitz					
GeB1.	Domenico Vigliarolo	C	Naples	1580	Kart. F 40
GeB2.	Antonio Millo	A14	Venice	1586	MS. Ham. 446
GeB3.	Joan Martines	A14	Messina	1591	MS. Ham. 430
GeB4.	Anonymous	C	?	[16th cent.]	Kart. 2862
GeB5.	Anonymous	C	?	[16th cent.]	Kart. 13064
GeB6.	[Battista Agnese]	A16	[Venice]	[16th cent.]	MS. Ham. 529
GeB7.	Anonymous	C	?	[17th cent.]	Kart. T 301
Dresden, Sächsische Landesbibliothek					
GeD1.	Battista Agnese	A10	Venice	1544	Mscr. Dresd. F 140a
GeD2.	[Battista Agnese]	A10	[Venice]	[16th cent.]	Mscr. Dresd. F 140b
GeD3.	Diogo Homem	A22	Venice	1568	Mscr. Dresd. F 59a
Gotha, Forschungs- und Landesbibliothek					
GeGo1.	Battista Agnese	A12	Venice	1543	Memb. II 146
Göttingen, Niedersächsische Staats- und Universitätsbibliothek					
GeG1.	[Battista Agnese]	C	[Venice]	[16th cent.]	Cod. MS. Mapp. 9
Karlsruhe, Badische Landesbibliothek					
GeK1.	Anonymous (Catalan)	C	?	[16th cent.]	S 5
Kassel, Gesamhochschul-Bibliothek					
GeKa1.	Battista Agnese	A11	Venice	1542	4° MS. hist. 6
Munich, Bayerische Staatsbibliothek					
GeM1.	Vesconte Maggiolo	A7	Genoa	1519	Cod. icon. 135

12. Nautical chart of the Aegean.

APPENDIX 7.1 (*continued*)

GeM2.	[Battista Agnese]	A10	[Venice]	[16th cent.]	Cod. icon. 136
GeM3.	Jacopo Maggiolo	C[13]	Genoa	1551	Cod. icon. 140 f. 80
GeM4.	Anonymous	C	?	[16th cent.]	Cod. icon. 140 f. 81
GeM5.	Anonymous	C	?	[16th cent.]	Cod. icon. 140 f. 83
GeM6.	Anonymous	C	?	[16th cent.]	Cod. icon. 131
Munich, Universitätsbibliothek					
GeM7.	[Battista Agnese]	A19	[Venice]	[16th cent.]	Cim. 18
GeM8.	Anonymous	A4	?	[16th cent.]	Cim. 20
Wolfenbüttel, Herzog August Bibliothek					
GeW1.	Battista [Agnese]	C	Venice	1514	Cod. Guelf. 100 Aug. 2°
GeW2.	[Battista Agnese]	A10	[Venice]	[16th cent.]	Cod. Guelf. 4. 1 Aug. 4°
GREECE					
Athens, Benaki Museum					
GrA1.	Anonymous	A2	[Marseilles]	[17th cent.]	26733
GrA2.	Anonymous (Greek)	C	?	[16th/17th cent.][14]	36215
IRELAND					
Dublin, Trinity College					
IrD1.	Battista Agnese	A11	Venice	1544	K 3.15, no. 917
ITALY					
Albissola Marina, Palazzo del Comune					
ItA1.	Guglielmo Saetone	A5[15]	[Albissola]	1682–83	
Bergamo, Biblioteca Civica Angelo Mai					
ItBe1.	[Battista Agnese]	A17	[Venice]	[16th cent.]	MA 557
Bologna, Archivio di Stato					
ItBo1.	Joan Oliva	C	Messina	1599	Port. 1599 Arch., Malvezzi Campeggi
Bologna, Biblioteca Comunale dell'Archiginnasio					
ItBo2.	Conte di Ottomanno Freducci	A6	[Ancona]	1539	Vetrine: n. 1
ItBo3.	Jacopo Scotto	A7	Naples	1593	Vetrine: n. 2
ItBo4.	Vincenzo Volcio	C	Leghorn	1601	Sala XVI degli Inc.
ItBo5.	Placido Caloiro e Oliva	C	Messina	1639	Sala XVI degli Inc.
ItBo6.	Placido Caloiro	A6	Messina	1665	Vetrine: n. 7
ItBo7.	Trophème Vernier	A2	Marseilles	1679	Sala XVI degli Inc.
ItBo8.	Anonymous (French)	A2	[Marseilles]	[17th cent.]	Sala XVI degli Inc.
Bologna, Museo della Specola					
ItBo9.	Banet Panades	C	Palermo	1556	Biblioteca
ItBo10.	Giulio Petrucci	C	Pisa	1571	Biblioteca
Bologna, Biblioteca Universitaria					
ItBo11.	[Battista Agnese]	A18	[Venice]	[16th cent.]	Cod. 997
ItBo12.	Placido Caloiro e Oliva	C	Messina	1622	Rot. 4

13. This chart, the two anonymous charts that follow, an anonymous Portuguese chart, and one signed by Thomas Hood are bound with the manuscript maps of Robert Dudley.

14. From the collection of Clive Burden.

15. Five nautical charts are inserted in the portolan "Stella guidante di pilotti e marinari."

APPENDIX 7.1 (*continued*)

ItBo13.	Placido Caloiro e Oliva	A3	Messina	1641	Cod. 368
ItBo14.	Anonymous	C	?	[17th cent.]	Rot. 81
Bordighera, Istituto Internazionale di Studi Liguri					
ItBr1.	Joan Martines	C	Naples	1590	
ItBr2.	Anonymous	C[16]	?	[16th cent. ?]	
Brescia, Civica Biblioteca Queriniana					
ItBs1.	[Battista Agnese]	A10	[Venice]	[16th cent.]	Legato Martinengo I.II, 24
Cagliari, Biblioteca del Consiglio Regionale della Sardegna					
ItCa1.	Jacopo Russo	C	Messina	1549	
ItCa2.	Giovanni Antonio Maggiolo	C	[Genoa ?]	1575	
ItCa3.	Joan Oliva	C	Leghorn	1522	
Catania, Biblioteca Regionale Universitaria					
ItCt1.	Battista Agnese	C	Venice	1562	MS. U. 85
Cava de' Tirreni, Museo della Badia di Cava					
ItCv1.	Matteo Prunes	C	Palma de Mallorca	1560	
Cefalù, Fondazione Culturale Mandralisca					
ItCe1.	[Placido Caloiro e Oliva]	A2	[Messina]	[17th cent.]	
Cortona, Biblioteca Comunale e dell'Accademia Etrusca					
ItCo1.	Joan Martines	C	Messina	1550	n. 100
ItCo2.	Père Juan Prunes	C	Palma de Mallorca	[17th cent.]	n. 99
Fano, Biblioteca Comunale Federiciana					
ItFa1.	Vesconte Maggiolo	C	?	1504	
Fermo, Biblioteca Comunale					
ItFe1.	Anonymous	A4	?	[16th cent.]	MS. 71
Florence, Accademia di Belle Arti					
ItFi1.	Jacopo Russo	C	Messina	1532	n. 10
ItFi2.	Rossi ?	C	Messina	1559	n. 1
ItFi3.	Anonymous (maiorchino)	C	Malta	1574	n. 9
ItFi4.	Placido Caloiro e Oliva	C	Messina	1627	n. 8 bis
ItFi5.	Pietro Cavallini	A3	Leghorn	1665	n. 6
Florence, Archivio di Stato					
ItFi6.	Jacopo Russo	C	Messina	1520	Carte nautiche 12
ItFi7.	Conte di Ottomanno Freducci	C	Ancona	[16th cent.]	Carte nautiche 15
ItFi8.	Anonymous	A3	?	[16th cent.]	Carte nautiche 16
ItFi9.	Reinaut Barthollomiu de Ferrieros and Matteo Prunes	C	Palma de Mallorca	1592	Carte nautiche 14
ItFi10.	Anonymous	C	?	[16th or 17th cent.]	Carte nautiche 18
ItFi11.	Vincenzo Volcio	C	Naples	1607	Carte nautiche 19
ItFi12.	Placido Oliva	C	Messina	1615	Carte nautiche 21

16. Fragment of a nautical chart found in a book's binding.

APPENDIX 7.1 (*continued*)

Florence, Biblioteca Medicea Laurenziana					
ItFi13.	Battista Agnese	A11	Venice	1543	Med. Pal. 245
ItFi14.	[Battista Agnese]	A26	[Venice]	[16th cent.]	Acq. e Doni 3
ItFi15.	Joan Martines	C	Messina	1568	Acq. e Doni 183
ItFi16.	Salvatore Oliva	A7	Marseilles	1620	Conv. Soppr. 625
ItFi17.	Joan Oliva	C	Leghorn	1632	Acq. e Doni 247
ItFi18.	Anonymous	A4	?	[17th cent.]	Med. Pal. 246
Florence, Biblioteca Marucelliana					
ItFi19.	Anonymous	A4	?	[17th cent.]	MS. B.VII.26
Florence, Biblioteca Nazionale Centrale					
ItFi20.	Vesconte Maggiolo	A15	Genoa	1548	Banco Rari 196
ItFi21.	Olives[17]	A5	?	1564	Magl. XIII. 3
ItFi22.	"Angelus"	C	Marseilles	1571	Port. n. 6
ItFi23.	Baldassare Maggiolo	C	Genoa	1583	Port. n. 3
ItFi24.	[Battista Agnese]	A10	[Venice]	[16th cent.]	Banco Rari 32
ItFi25.	Anonymous	C	?	[16th cent. ?]	Port. n. 22
ItFi26.	Anonymous	C	?	[16th cent. ?]	Port. n. 15
ItFi27.	Joan Oliva	A12	Messina	1609	II-I-511
ItFi28.	[Giovanni Battista Cavallini]	A4	[Leghorn]	[17th cent.]	Port. n. 4
Florence, Biblioteca Riccardiana					
ItFi29.	[Francesco Ghisolfi]	A14	?	[16th cent.]	Ricc. 3615
ItFi30.	[Francesco Ghisolfi]	A15	?	[16th cent.]	Ricc. 3616
ItFi31.	Bartomeu Olives	C	Messina	1588	Ricc. 3828
ItFi32.	Placido Caloiro e Oliva	C	Messina	1629	Ricc. 3829
Florence, Istituto e Museo di Storia della Scienza					
ItFi33.	Jacopo Maggiolo	C	Genoa	1565	
ItFi34.	Joan Oliva	A16	?	1616	Antico G.f. 25
ItFi35.	Giovanni Battista Cavallini	A24	Leghorn	1652	Antico G.f. 35
ItFi36.	Anonymous	A3	?	[17th cent.]	Antico G.f. 40PR
ItFi37.	Anonymous (Catalan)	A8	?	[17th cent.]	Antico G.f. 26
Genoa, Biblioteca Civica Berio					
ItGe1.	Jacopo Maggiolo	C	Genoa	1564	
Genoa, Biblioteca Universitaria					
ItGe2.	[Francesco Ghisolfi]	A9	?	[16th cent.]	MSS. G. V. 32
ItGe3.	Giovanni Francesco Monno	A7[18]	Genoa	1633	MSS. F. VII. 4
ItGe4.	Anonymous (Catalan)	C	?	[17th cent. ?]	Vestibolo Rari
ItGe5.	Anonymous	A4	?	[17th cent.]	MSS. C. VII. 42
ItGe6.	Anonymous	A3	?	[17th cent.]	MSS. B. IX. 12
Genoa, Dipartimento di Scienze dell'Antichità e del Medioevo, Sezione di Studi Storici e Geografici					
ItGe7.	Placido Caloiro e Oliva	C	Messina	1639	
Genoa, Museo Navale					
ItGe8.	Banet Panades	C	Messina	1557	Ex Castello d'Albertis
ItGe9.	Jacopo Maggiolo	C	Genoa	1561	
ItGe10.	Joan Martines	A4	Messina	1571	

17. Signed with the family name only.
18. Seven nautical charts inserted in the codex "Arte della Vera Navegatione."

APPENDIX 7.1 (*continued*)

ItGe11.	Matteo Prunes	C	Palma de Mallorca	1571	Ex Castello d'Albertis
ItGe12.	[Battista Agnese]	A1[19]	[Venice]	[16th cent.]	
ItGe13.	Vicente Prunes	C	Palma de Mallorca	1601	
Genoa, Palazzo Doria "del Principe"[20]					
ItGe13bis.	Giovanni Francesco Monno	C	Genoa	1613	
Genoa, Società Ligure di Storia Patria					
ItGe14.	Gerolamo Costo	C	Barcelona	[17th cent.]	
ItGe15.	Giovanni Battista Cavallini	C	Leghorn	1639	
Gorizia, Biblioteca Provinciale					
ItGo1.	Anonymous (Catalan)	C[21]	?	[16th cent.]	c. geogr. n. 234
Iesi, Biblioteca Comunale					
ItJ1.	Anonymous	C[22]	?	[16th cent.]	
Lucca, Biblioteca Statale					
ItL1.	[Conte di Ottomanno Freducci]	C	?	[16th cent.]	MS. 2720
ItL2.	Anonymous (Greek)	A6	?	[16th cent.]	MS. 1898
Mantua, Biblioteca Comunale					
ItMa1.	[Salvat de Pilestrina ?]	C	?	[16th cent.]	MS. 1032
ItMa2.	Angelo Freducci	A9	Ancona	1556	MS. 136
Milan, Biblioteca Ambrosiana					
ItMi1.	[Battista Agnese]	A12	[Venice]	[16th cent.]	SP II. 34
ItMi2.	Jacopo Maggiolo	C	Genoa	1602	SP 11/18
ItMi2bis.	Anonymous	A4	?	[16th cent.]	SP II. 36
ItMi2ter.	Jaume Olives	A4	Naples	1563	SP II. 37
Milan, Biblioteca Nazionale Braidense					
ItMi3.	Joan Martines	A5	Messina	1579	AG. XI. 61
ItMi4.	[Jean André ?] Bremond	A2	Marseilles	1662	AE. XIV. 13
ItMi5.	Guglielmo Saetone	A5[23]	[Albissola]	1682–83	AD. XVI. 10
Milan, Biblioteca Trivulziana e Archivio Storico Civico					
ItMi6.	[Battista Agnese]	A9	[Venice]	[16th cent.]	Cod. N. 2160
ItMi7.	Placido Caloiro e Oliva	C	Messina	1645	Perg. miniate n° 39
Modena, Biblioteca Estense e Universitaria					
ItMo1.	Anonymous	C[24]	?	[16th cent.]	C. G. A. 5a. (1–2)
ItMo2.	Jacopo Russo	A12	Messina	1521	α.O.3.15
ItMo3.	Giulio Petrucci	C	Pisa	1571	γ.A.1.11
ItMo4.	Jean François Roussin	A4	Toulon	1658	α.M.1.9
ItMo5.	Anonymous	C	?	[17th cent.]	α.M.1.23
ItMo6.	Anonymous	C	?	[17th cent.]	γ.M.1.29
Monopoli, Archivio Vescovile					
ItMn1.	Anonymous (Catalan)	C	?	[16th cent. ?]	

19. Loose sheet depicting the Black Sea from an atlas.
20. A private institution open to the general public.
21. Two fragments of a nautical chart.
22. Fragment of a nautical chart.
23. Five nautical charts inserted in the portolan "Stella guidante de pilotti e Marinari."
24. Two fragments by different hands originally glued together but now restored, separated, and framed side by side in the same frame.

APPENDIX 7.1 (*continued*)

Naples, Biblioteca Nazionale "Vittorio Emanuele III"					
ItNa1.	[Battista Agnese]	A25	[Venice]	[16th cent.]	MS. VIII.D.7
ItNa2.	[Francesco Ghisolfi]	A11	?	[16th cent.]	MS. VIII.D.6
ItNa3.	Jaume Olives	C	Messina	1559	MS. XII.D.98
ItNa4.	Joan Oliva	A10	Marseilles	1614	MS. XII.D.72
ItNa5.	Placido Caloiro e Oliva	C	Messina	1621	MS. XV. AA. 9(4)
ItNa6.	Giovanni Battista Caloiro e Oliva	A4[25]	Messina	1639–42–43	MS. XII.D.71
ItNa7.	Placido Caloiro e Oliva	C	Messina	1647	MS. XV. AA.9(5)
ItNa8.	[Giovanni Battista Caloiro e Oliva]	A3	[Messina]	[17th cent.]	MS. XII.D.70
ItNa9.	Anonymous	A3	?	[17th cent.]	MS. XV.AA.9(1a–c)
ItNa10.	Anonymous	A3	?	[17th cent.]	MS. XV.AA.9(2a–c)
ItNa11.	Anonymous	C3[26]	?	[17th cent.]	MS. XV.AA.9(6–8)
ItNa12.	Anonymous	C3[27]	?	[17th cent.]	MS. XV.AA.9(9–11)
ItNa13.	Anonymous	C2[28]	?	[17th cent.]	MS. XV.AA.9(12–13)
ItNa14.	Anonymous (Catalan)	A6[29]	?	[16th cent.]	MS. Branc. II. G. 16
ItNa15.	Anonymous	C[30]	?	[17th cent.]	MS. XV AA.9(3)
Palermo, Biblioteca Comunale					
ItPa1.	Joan Oliva	A4	Messina	1596	2 Qq H 225
ItPa2.	Anonymous	A2	?	[17th cent.]	2 Qq H 226
Palermo, Società Siciliana di Storia Patria					
ItPa3.	Placido Caloiro e Oliva	C	Messina	1638	
Parma, Archivio di Stato					
ItPr1.	[Battista Agnese]	C	[Venice]	[16th cent.]	
Parma, Biblioteca Palatina					
ItPr2.	Vesconte Maggiolo	A4	Naples	1512	n. 1614
ItPr3.	Vesconte and Giovanni [Antonio] Maggiolo	C	Genoa	1525	n. 1623
ItPr4.	Jacopo Russo	C	Messina	1540	n. 1615
ItPr5.	Aloisio Cesani	A4	?	1574	n. 1616
ItPr6.	Mateo Griusco	C	Palma de Mallorca	1581	n. 1617
ItPr7.	Joan Oliva	C	Messina	1608	n. 1618
ItPr8.	Giovanni Battista and Pietro Cavallini	A3	Leghorn	1654	n. 1619
ItPr9.	Anonymous	C	?	[17th cent.]	n. 1620
Pavia, Biblioteca Universitaria					
ItPv1.	Jaume Olives	C	Messina	1553	Sala MS
Perugia, Biblioteca Augusta					
ItPe1.	Conte di Ottomanno Freducci	A5	[Ancona]	1512	MS. 2915 (1512)

25. Only the chart dated 1643 could be the work of Giovanni Battista Caloiro e Oliva.
26. Three loose charts of the Aegean Sea.
27. Three loose charts of the Mediterranean.
28. Two loose charts of the European and African Atlantic coasts.
29. From the Biblioteca Bracacciana.
30. Nautical chart of the eastern Mediterranean.

APPENDIX 7.1 (*continued*)

Pesaro, Biblioteca e Musei Oliveriana					
ItPs1.	Vesconte Maggiolo	C	Genoa	1536	
ItPs2.	Anonymous	C[31]	?	[16th cent.]	
Piacenza, Biblioteca Comunale Passerini Landi					
ItPc1.	Joan Oliva	A5	Leghorn	1522	MS. Com. 6
Pisa, Archivio di Stato					
ItPi1.	Juan Oliva	C	[Naples]	160[3]	Dipl. Simonelli
ItPi2.	Giovanni Girolamo Sosuich	C	?	[17th cent.]	Dep. Upezzinghi
ItPi3.	Pietro Cavallini	A4	Leghorn	1688	S. Stefano n. 7638
Pisa, Biblioteca Universitaria					
ItPi4.	Bartomeu Olives	A11	Messina	1582	MS. 602
Poppi, Biblioteca Comunale "Rilliana"					
ItPo1.	[Joan Oliva ?]	A3	Leghorn	1650	Coll. MS. n. 6
Rimini, Biblioteca Civica Gambalunga					
ItRi1.	Joan Oliva	C	Leghorn	1618	Sala Manoscritti
Rome, Biblioteca Angelica					
ItRo1.	[Joan Martines]	A20	[Messina]	[16th cent.]	MS. 1311
ItRo2.	Anonymous	A3	?	[16th cent. ?]	MS. 2384
Rome, Biblioteca Nazionale Centrale					
ItRo3.	Jacopo Russo	C	Messina	1535	Carte nautiche, 8
ItRo4.	Jacopo Maggiolo	C	Genoa	1561	Carte nautiche, 2
ItRo5.	Jaume Olives	C	Messina	1561	Carte nautiche, 3
ItRo6.	Jacopo Maggiolo	C	Genoa	1567	Carte nautiche, 5
ItRo7.	Diogo Homem	C	Venice	1569	Carte nautiche, 4
ItRo8.	Antonio Millo	A23	[Venice]	1582–84	Carte nautiche, 6
ItRo9.	Placido Caloiro e Oliva	C	Messina	1636	Carte nautiche, 7
Rome, Biblioteca Casanatense					
ItRo10.	Angelo Freducci	C	Ancona	1556	MS. 4866
ItRo11.	Jacopo Maggiolo	C	Genoa	1558	MS. 4865
ItRo12.	Placido Caloiro e Oliva	C	Messina	1657	MS. 4864
ItRo13.	Anonymous (French)	A4	?	[17th cent.]	MS. 468
Rome, Biblioteca Vallicelliana					
ItRo14.	[Jaume Olives ?]	C	[Messina ?]	[16th cent.]	
ItRo15.	Anonymous	C	?	[16th cent.]	
ItRo16 has been moved to Genoa; see ItGe13bis.					
Rome, Società Geografica Italiana					
ItRo17.	Giovanni Battista Cavallini	C	Leghorn	[17th cent.]	
ItRo18.	Anonymous	C	?	[17th cent.]	
Rome, Galleria Colonna[32]					
ItRo19.	Bartolomeo Bonomi (Bonomini)	C[33]	Ancona	[16th cent.]	
Rovigo, Biblioteca dell'Accademia dei Concordi					
ItRv1.	Anonymous	A8	?	[16th cent. ?]	MS. Silv. 182

31. The celebrated Pesaro world chart.
32. A private institution open to the general public.
33. Loose sheet from an atlas representing the central Mediterranean.

APPENDIX 7.1 (*continued*)

ItRv2.	Anonymous	A4	?	[16th cent. ?]	MS. Silv. 68
ItRv3.	Placido Caloiro e Oliva	C	Messina	1641	Senza coll.
ItRv4.	Placido Caloiro e Oliva	C	Messina	1643	Pergamene 304
Sassari, Biblioteca Universitaria					
ItSs1.	Anonymous	C	?	[16th cent. ?]	MS. 248
Savona, Biblioteca Civica "Barrili"					
ItSa1.	Placido Caloiro e Oliva	C	Messina	1639	
Savona, Archivio Vescovile					
ItSa2.	Anonymous	C	?	[17th cent.]	
Siena, Biblioteca Comunale degli Intronati					
ItSi1.	Rocco Dalolmo	C	Ancona	1542	S.V.1
ItSi2.	Matteo Prunes	C	Palma de Mallorca	1553	S.V.3
ItSi3.	Matteo Prunes	C	Palma de Mallorca	1599	S.V.4
ItSi4.	Anonymous	C	?	[17th cent.]	S.V.6
ItSi5.	Anonymous (Catalan)	C	?	[17th cent.]	S.V.7
Turin, Archivio di Stato					
ItTo1.	Anonymous	A4	?	1529	J. b. II. 11
ItTo2.	Vesconte Maggiolo	C	Genoa	1535	J. b. III. 18
ItTo3.	Joan Martines	A8	Messina	1566	J. b. II. 10
ItTo4.	Anonymous	A4	?	[16th cent. ?]	J. b. II. 7
Turin, Biblioteca Reale					
ItTo5.	[Battista Agnese]	A12	[Venice]	[16th cent.]	MSS. Varia 115
ItTo6.	[Battista Agnese]	A28	[Venice]	[16th cent.]	MSS. Varia 148
ItTo7.	Jacopo Russo	C	Messina	1565	O. XVI. 4
ItTo8.	Joan Martines	A5	Messina	1586	MSS. Varia 165
ItTo9.	Anonymous	A8	[Venice ?]	[16th cent.]	MSS. Varia 15
ItTo10.	[Jean François Roussin ?]	C	[Marseilles ?]	[17th cent.]	MSS. Varia 194 bis 1
ItTo11.	Jean François Roussin	A2	Venice	1673	MSS. Varia 194 bis 2
ItTo12.	Anonymous (French)	A3	[Marseilles ?]	[17th cent.]	MSS. Varia 188
ItTo13.	Anonymous	C	?	[17th cent.]	O. II. 80
Treviso, Biblioteca Comunale					
ItTr1.	Vesconte Maggiolo	A4	Genoa	1549	MS. 425
ItTr2.	Jean François Roussin	A4	Marseilles	1658	MS. 1683
ItTr3.	François Ollive	A3[34]	Marseilles	1652	MS. 1562
ItTr4.	Jean François Roussin	A9	Venice	1664	MS. 1562
Trieste, Musei Civici di Storia ed Arte					
ItTs1.	Anonymous	C	[Venice ?]	[16th cent.]	434 Ge
ItTs2.	Jean André Bremond	A5	Marseilles	1669	436 Ge
Trieste, Museo della Fondazione "Giovanni Scaramangà di Altomonte"					
ItTs4.	Placido Caloiro e Oliva	C	Messina	1635	2850
ItTs5.	Anonymous	C	?	[16th cent.]	2851

34. Three charts bound together with nine charts made by Jean François Roussin.

APPENDIX 7.1 (*continued*)

Venice, Università Ca' Foscari di Venezia Biblioteca Generale					
ItVe1.	Bartomeu Olives	C	Palma de Mallorca	1538	
ItVe2.	Alvise Gramolin	C[35]	[Venice]	1612	
Venice, Biblioteca Nazionale Marciana					
ItVe3.	Jacopo Scotto	C	Civitavecchia	1589	It IV 8 = 10056
ItVe4.	Joannes Oliva	C	Messina	1599	It IV131 = 10083
ItVe5.	Sebastiano Condina	C	Naples	1615	It IV 505 = 10036
ItVe6.	Brasito Olivo	A5	Messina	1633	It IV 126 = 5325
ItVe7.	Nicolò Guidalotti	A4	[Venice]	1646	It IV 10 = 5062
ItVe8.	F. O. [François Ollive ?]	A2	[Marseilles]	1659	It IV 183 = 5074
ItVe9.	Battista Agnese	A12	Venice	1545	It IV 492 = 5120
ItVe10.	[François Ollive]	C	[Marseilles]	[17th cent.]	It IV 158 = 5073
ItVe11.	Giorgio Sideri	A10	[Venice ?]	1563	It IV 148 = 5451
ItVe12.	Giorgio Sideri	A6	Crete	1537	It IV 61 = 5323
ItVe13.	Battista Agnese[36]	A30	Venice	1554	It IV 62 = 5067
ItVe14.	Marco Fassoi	C[37]	Venice	1675	It VII 343 = 10045
ItVe15.	Anonymous	C	[Venice ?]	[16th cent. ?]	It IV 506 = 10037
ItVe16.	[Joan Martines]	A2	[Messina ?]	[16th cent.]	It IV 559 = 5582
ItVe17.	Anonymous	A8	?	[16th cent. ?]	It VI 203 = 5631
ItVe18.	Salvatore Oliva	A3	Marseilles	1631	It IV 528 = 8301
Venice, Museo della Fondazione Querini Stampalia					
ItVe19.	Anonymous	C	?	[17th cent. ?]	Cl.III, Cod. LXIII
ItVe20.	Anonymous	C	?	[16th cent. ?]	Cl.III, Cod. LXIV
ItVe21.	Placido Caloiro e Oliva	A4	Messina	1639	Cl.III, Cod. X
ItVe22.	Gasparo Tentivo	C[38]	[Venice ?]	[17th cent.]	Cl.III, Cod. XXII
Venice, Museo Correr					
ItVe23.	Anonymous	C	[Venice ?]	[16th cent.]	Port. 30
ItVe24.	Giovanni Xenodocos	A3	[Venice ?]	1520	Port. 29
ItVe25.	[Battista Agnese]	A8	[Venice]	[16th cent.]	Port. 3
ItVe26.	[Battista Agnese]	A10	[Venice]	[16th cent.]	Port. 31
ItVe27.	[Battista Agnese]	A7	[Venice]	[16th cent.]	Port. 32
ItVe28.	[Battista Agnese]	A14	[Venice]	[16th cent.]	Port. 2
ItVe29.	Battista Agnese	A29	Venice	1553	Port. 1
ItVe30.	Anonymous	C	[Venice ?]	[16th cent.]	Port. 35
ItVe31.	Giorgio Sideri	C	[Venice]	1550	Port. 6
ItVe32.	Giorgio Sideri	C[39]	[Venice]	1560	Port. 7
ItVe33.	Giorgio Sideri	C	[Venice]	1561	Port. 8
ItVe34.	Giorgio Sideri	C[40]	[Venice]	1562	Port. 9
ItVe35.	[Giorgio Sideri]	C	[Venice]	[16th cent.]	Port. 33
ItVe36.	Jacopo Maggiolo	C	Genoa	[16th cent.]	Port. 15
ItVe37.	[Antonio Millo ?]	A8	[Venice ?]	[16th cent.]	Port. 39
ItVe38.	[Joan Martines]	A7	[Messina]	[16th cent.]	Port.38

35. Nautical chart of the Aegean.
36. The atlas is signed "Battista Palnese," but it is without doubt the work of Agnese.
37. Nautical chart of the Adriatic.
38. Nautical chart inserted into the portolan "Il Nautico Ricercato."
39. Three fragments of one chart.
40. Nautical-terrestrial map of the island of Crete.

APPENDIX 7.1 (*continued*)

ItVe39.	Matteo Prunes	C	Palma de Mallorca	1560	Port. 20
ItVe40.	Matteo Prunes	C	Palma de Mallorca	1578	Port. 19
ItVe41.	Jaume Olives	C	Naples	1563	Port. 17
ItVe42.	Jaume Olives	C	Marseilles	1566	Port. 18
ItVe43.	Bartomeu Olives	C	Messina	1584	Port. 16
ItVe44.	Anonymous	C	?	[17th cent. ?]	Port. 34
ItVe45.	Anonymous	C	?	[17th cent. ?]	Port. 36
ItVe46.	Anonymous	A9	?	[17th cent. ?]	Port. 37
ItVe47.	Alvise Gramolin	C[41]	[Venice]	1624	Port.44
ItVe48.	Placido Caloiro e Oliva	A6	Messina	1646	Port. 10
ItVe49.	Placido Caloiro e Oliva	A5	Messina	1650	Port. 11
ItVe50.	Anonymous	C	?	[17th cent.]	Port. 41
ItVe51.	Anonymous	C	?	[17th cent.]	Port. 43
ItVe52.	Père Juan Prunes	A3	Palma de Mallorca	1651	Port. 21
ItVe53.	Anonymous	C	?	[17th cent.]	Port. 42
ItVe54.	Jean François Roussin	A5	Venice	[17th cent.]	Port. 24
ItVe55.	Marco Fassoi	C	Venice	1669	Port. 14
Venice, Museo Storico Navale					
ItVe56.	Francesco Oliva	C	Messina	1611	
ItVe57.	Joan Oliva	C	Marseilles	1612	
ItVe58.	Anonymous	A4	[Marseilles ?]	[17th cent.]	
Verona, Biblioteca Capitolare					
ItVr1.	Jacopo Scotto	A9	Civitavecchia	1592	Cod. CCCXL
Verona, Biblioteca Civica					
ItVr2.	Jaume Olives	C	Messina	1552	MS. 1956
ItVr3.	Annibale Impuccio	C	Naples	1622	MS. 2967
ItVr4.	Annibale Impuccio	C	Naples	1625	MS. 2966
ItVr5.	[Placido Caloiro] e Oliva	C	Messina	1622	ex MS. 196
Vicenza, Biblioteca Civica Bertoliana					
ItVi1.	Placido Caloiro e Oliva	C	Messina	1627	
ItVi2.	Placido Caloiro e Oliva	A3	Messina	1633	
ItVi3.	Anonymous	A3	?	[17th cent.]	
Volterra, Biblioteca Guarnacci					
ItVo1.	Placido Caloiro e Oliva	C	Messina	[17th cent.]	C.N. 3 B.G.
JAPAN					
Kyōto, Geographical Museum—Kyōto University					
JK1.	Anonymous (French)	A2	[Marseilles]	[17th cent.]	
Tenri, Tenri Central Library					
JT1.	[Battista Agnese]	A10	[Venice]	[16th cent.]	

41. Chart of the Adriatic.

APPENDIX 7.1 (*continued*)

MALTA					
Valletta, National Museum					
MaV1.	[Francesco Oliva]	C	[Messina]	[17th cent.]	
MEXICO					
Mexico City, Sociedad Mexicana de Geografía y Estadística					
MM1.	[Francesco Ghisolfi]	A11	?	[16th cent.]	Fondo reservado
THE NETHERLANDS					
Amsterdam, Nederlands Scheepvaartmuseum					
NA1.	Vesconte Maggiolo	C	Naples	1515	A-817
The Hague, Nationaal Archief (formerly Algemeen Rijksarchief)					
NG1.	Jacopo Russo	C	Messina	1533	
The Hague, Koninklijke Bibliotheek					
NG2.	Conte di Ottomanno Freducci	A5	[Ancona]	1524	133 A 4
NG3.	[Battista Agnese]	A?	[Venice]	[16th cent.]	129 E 16
NG4.	Giovanni Battista Cavallini	A9[42]	Leghorn	1642	129 AQ 25
PORTUGAL					
Lisbon, Sociedade de Geografia de Lisboa					
PL1.	[Battista Agnese]	A9	[Venice]	[16th cent.]	14-A-12
Lisbon, Instituto dos Arquivos Nacionais/Torre do Tombo					
Pl2.	Anonymous (Catalan)	C[43]	?	[17th cent. ?]	
RUSSIA					
St. Petersburg, Saltykov Bibliothek					
RP1.	Battista Agnese	A13	Venice	1546	
St. Petersburg, Archive Zentralaogo Kartografitscheskogo Proisvodstva Vojenno-morskogo Flota					
RP2.	Battista Agnese	A11	Venice	1554	
SPAIN					
Barcelona, Museu Marítim					
SpBa1.	Pietro Russo	C	Messina	1508	Inv. 841
SpBa2.	Bartomeu Olives	C	Palma de Mallorca	1538	Inv. 9796
SpBa3.	Joan Oliva	A4	Messina	1592	Inv. 3233
SpBa4.	[Jaume Olives ?]	A2[44]	?	[16th cent.]	Inv. 10255–10256
SpBa5.	Anonymous	C[45]	?	[16th cent.]	Inv. 842
SpBa6.	Vicente Prunes	A5	Palma de Mallorca	1600	Inv. 4775
SpBa7.	Francesco Oliva	C	Messina	1615	Inv. 7569
SpBa8.	François Ollive	A5	Marseilles	1658	Inv. 10257

42. Bound with seven charts of António Sanches (Lisbon, 1641).

43. Two fragments of a nautical chart found in Cabeço de Vide; see Alfredo Pinheiro Marques, "Portolan Fragments Found in Portugal," *Map Collector* 65 (1993): 42–44.

44. Two loose sheets from an atlas.

45. Loose sheet from an atlas.

APPENDIX 7.1 (*continued*)

Barcelona, Arxiu Capitular de la S. E. Catedral Basilica					
SpBa9.	Anonymous	C[46]	?	[16th cent.]	
Bilbao, Sociedad Bilbaína					
SpBi1.	Anonymous (Catalan)	C[47]	?	[16th cent. ?]	Port. n. 7
SpBi2.	François Ollive	A4[48]	Marseilles	1661	Port. nn. 1-2-3-4
SpBi3.	Anonymous (Catalan)	C	?	[17th cent.]	Port. n. 5
SpBi4.	Anonymous (Catalan)	C	?	[17th cent.]	Port. n. 6
Granada, Biblioteca Historica—Universidad de Granada					
SpG1.	Anonymous (French)	A3[49]	?	[17th cent.]	
Madrid, Biblioteca Nacional					
SpM1.	Vesconte Maggiolo	C	Genoa	1535	MSS. Res. 238 bis
SpM2.	Battista Agnese	A13	Venice	1544	MSS. 176
SpM3.	Joan Martines	A19	Messina	1587	MSS. Vit. 4-20
SpM4.	Vincenzo Volcio	A4	Naples	1592	MSS. 17.818
SpM5.	Anonymous	C	?	[17th cent.]	MSS. Vit. 4-21
SpM6.	Anonymous	C	?	[17th cent.]	MSS. 12.680
SpM7.	Anonymous	C	?	[17th cent.]	Res. 236 bis
Madrid, Palacio Real					
SpM8.	Joan Riczo Oliva	A17	Naples	1580	MS. 1271
SpM9.	Baldassare Maggiolo	A2[50]	?	1588	MS. 1271
Madrid, Fundación Casa de Alba					
SpM10.	Joan Martines	A7	Messina	1577	
Madrid, Museo Naval					
SpM11.	Matteo Prunes	C	Palma de Mallorca	1563	PM-1
SpM12.	Joan Martines	C	Messina	1565	Coll. priv. (deposito)
SpM13.	Joan Martines	A5	Messina	1570	Coll. priv. (deposito)
SpM14.	Anonymous	C	?	[17th cent.]	Coll. priv. (deposito)
Madrid, Servicio Geográfico del Ejército					
SpM15.	Domingo Villaroel (Domenico Vigliarolo)	C	Naples	1589	Mapas Hist. de Europa n° 297
SpM16.	Joan Oliva	A11	Messina	1596	Atlas n° 13
SpM17.	Anonymous[51]	A5	?	[16th cent.]	Atlas n° 1
Palma de Mallorca, Biblioteca Vivot					
SpP1.	Anonymous (Catalan)	C	?	[16th cent.]	
Palma de Mallorca, Fundación Bartolome March Servera					
SpP2.	Jacopo Russo	C	Messina	1535	
SpP3.	Jaume Olives	C	Naples	1564	
SpP4.	Jaume Olives	C	Barcelona	1571	
SpP5.	Joan Oliva	A5	Messina	1582	
SpP6.	Joan Oliva	A15	Messina	1614	
SpP7.	Joan Oliva	C	Leghorn	1620	

46. Fragment of a nautical chart.
47. Loose sheet from an atlas.
48. Four loose sheets from an atlas.
49. Three loose sheets from an atlas.
50. Bound with the seventeen sheets of Joan Riczo Oliva.
51. The name of Juan Ortis Valero, appearing on the first page, seems to indicate its owner.

APPENDIX 7.1 (*continued*)

SpP8.	Giovanni Battista Cavallini	A3	Leghorn	1641	
SpP9.	Michel Prunes	A2[52]	?	[17th cent.]	
Toledo, Biblioteca Pública del Estado					
SpT1.	Salvat de Pilestrina	C	Palma de Mallorca	1533	MS. 530
Valencia, Universitat de Valencia, Biblioteca General i Historica					
SpV1.	Jacopo Russo	C	Messina	1563	MS. 896
SWEDEN					
Stockholm, Riksarkivet					
SvS1.	Giorgio Sideri	A8	[Venice]	1552 ?	Skoklostersaml I, fol.163
SvS2.	Anonymous	A2	?	[17th cent.]	Skoklostersaml.I, fol.182
Stockholm, Kungliga Bibliotheket, Sveriges Nationalbibliotek					
SvS3.	[Battista Agnese]	A10	[Venice]	[16th cent.]	Kartavd. Handrit. vol. 24
SvS4.	Joan Oliva	C	Leghorn	1630	Kartavd. Handrir. AB 50
SvS5.	[Jean François] Roussin	C	Marseilles	1680	Kartavd. Handrit. AB 50
Uppsala, Universitetsbiblioteket					
SvU1.	Anonymous	C	?	[16th cent. ?]	Kartavd. Sjökartor. Europa
SWITZERLAND					
Lucerne, Staatsarchiv des Kantons Luzern					
SwL1.	Anonymous (Catalan)	C	?	[16th cent.]	
SwL2.	Anonymous (French)	C	?	[17th cent.]	
St. Gall, Kantonsbibliothek (Vadiana)					
SwS1.	Thomas Caulet	C	Marseilles	[17th cent. ?]	MS. 341
SwS2.	Anonymous (Catalan)	A7	?	[16th cent. ?]	HK 2 W 4
Zurich, Zentralbibliothek					
SwZ1.	[Battista Agnese]	A14	[Venice]	[16th cent.]	MS. C-48-704
TURKEY					
Istanbul, Topkapi Sarayi Müzesi Kütüphanesi					
TI1.	Anonymous (French)	A11	?	[17th cent. ?]	
UNITED KINGDOM					
Belfast, Ulster Museum					
UKBe1.	[Battista Agnese]	A6	[Venice]	[16th cent.]	
Birmingham, City of Birmingham Museum and Art Gallery					
UKBi1.	Jacopo Russo	C	[Messina]	1528	
Cambridge, Trinity College Library					
UKC1.	Joan Martines	C	Messina	1584	R. 4.50

52. Two loose sheets from an atlas.

APPENDIX 7.1 (*continued*)

Cambridge, Cambridge University Library					
UKC2.	Estienne [Bremond]	C[53]	[Marseilles]	[17th cent.]	MS. Plans 697
Edinburgh, National Library of Scotland					
UKE1.	Giorgio Sideri	C	[Venice]	1560	MS. 20995
Edinburgh, Edinburgh University Library					
UKE2.	François Ollive	A3	Marseilles	1650	MS. Dc. 1.40.
Glasgow, Hunterian Museum					
UKG1.	Battista Agnese	A12	Venice	1542	Har. 38
(Greenwich) London, National Maritime Museum					
UKGr1.	Vesconte Maggiolo	C	Genoa	1546	N 32-9210C/G.230/1/ 10 MS.
UKGr2.	Vesconte Maggiolo	C	Genoa	1548	N36-CC sup. p.63/G.230:1/4 MS.
UKGr3.	[Joan Martines]	A13	[Mesna]	[16th cent.]	MS. 39-9926C/P25
UKGr4.	[Angelo Freducci]	C	[Ancona]	[16th cent.]	N39-9212C/G.230: 1/16 MS.
UKGr5.	Battista Agnese	A25	Venice	1554	MS. 39-9922C/P24
UKGr6.	Battista Agnese	A25	Venice	1555	MS. 33-9921C/P12
UKGr7.	Angelo Freducci	A9	Ancona	1555	MS. 58-078/P36
UKGr8.	Giulio Petrucci	C	Siena	[16th cent.]	N 32-CC1, p.40/G.230: 1/11 MS
UKGr9.	Joan Martines	A10	Messina	1572	MS. 33-9925C/P6
UKGr10.	Jacques Dousaigo	A6	Naples	1590	MS. 36-9929C/P7
UKGr11.	Anonymous (Catalan)	C	?	[16th cent.]	N39-699C/G.231: 1/1 MS
UKGr12.	Joan Oliva	A6	Messina	1592	MA 39-9931C/P22
UKGr13.	Anonymous (French)	A6	[Marseilles ?]	[17th cent.]	MS. 37-9934C/P11
UKGr14.	Francesco [Oliva]	C	Messina	1609	N51-1/G.230:1/16 MS
UKGr15.	Anonymous (French)	A2	?	[17th cent.]	MS. 37 9927C/P10
UKGr16.	Anonymous	A4	?	[17th cent.]	MS. 35-9937/P4
UKGr17.	Placido Caloiro e Oliva	C	Messina	1626	N 32 9216/G.230: 1/8 MS.
UKGr18.	Joan Oliva	A4[54]	Leghorn	1632	MS. 36 9930C/P5
UKGr19.	[Joan Oliva]	A6	[Leghorn]	[17th cent.]	MS. 33-9932C/P8
UKGr20.	Alberto de Stefano	C	Genoa	1644	N 32-9218/G.230: 1/14 MS.
UKGr21.	Giovanni Battista Cavallini	C	Leghorn	1656	MS. 37-152/P37
Liverpool, University of Liverpool Library					
UKLi1.	Anonymous (Catalan)	C	?	[16th cent.]	MS. F. 4. 17
London, British Library					
UKL1.	[Joan Martines]	A4	?	[16th cent.]	Add. MS. 9947
UKL2.	[Joan Martines]	A3	?	[16th cent.]	Add. MS. 10134
UKL3.	Anonymous	A3	?	[16th cent.]	Add. MS. 17048
UKL4.	Anonymous	C	?	[16th cent.]	Add. MS. 17539
UKL5.	[Jacopo Russo]	C	[Messina ?]	[16th cent.]	Add. MS. 31318B

53. Jean Michel Massing, "Two Portolan Charts of the Mediterranean in Cambridge by Joan Martines and Estienne Bremond," in *Tributes in Honor of James H. Marrow: Studies in Painting and Manuscript Illumination of the Late Middle Ages and Northern Renaissance,* ed. Jeffrey F. Hamburger and Anne S. Korteweg (London: Harvey Miller, 2006), 331–35.

54. Bound with two sheets of António Sanches (Lisbon, 1633).

APPENDIX 7.1 (*continued*)

UKL6.	Anonymous	A4	?	[16th cent.]	Eg. 767
UKL7.	[Vesconte Maggiolo]	A18	[Genoa ?]	[16th cent.]	Eg. 2803
UKL8.	Vesconte Maggiolo	C	Genoa	1520	Eg. 2857
UKL9.	[Ottomanno Freducci ?]	C	[Ancona ?]	1529	Add. MS. 11548
UKL10.	[Battista Agnese]	A7	[Venice]	[16th cent.]	Royal 14 C. 5
UKL11.	Battista Agnese	A11	Venice	1536	Add. MS. 19927
UKL12.	Jacopo Russo	C	Messina	1537	Add. MS. 27471
UKL12bis.	Conte di Ottomanno Freducci	A5	[Ancona]	1538	Add. MS. 22348
UKL13.	[Battista Agnese]	A11	[Venice]	[16th cent.]	Add. MS. 18154
UKL14.	[Battista Agnese]	A14	[Venice]	[16th cent.]	Eg. 2854
UKL15.	Jaume Olives	C	Messina	1559	Add. MS. 21943
UKL16.	[Joan Martines]	A10	?	[16th cent.]	Add. MS. 9814
UKL17.	Anonymous	A10	?	[16th cent.]	Eg. 2860
UKL18.	Jacopo Maggiolo	C	Genoa	1562	Add. MS. 9810
UKL19.	Giorgio Sideri	A15	[Venice]	1562	Eg. 2856
UKL20.	Bartomeu Olives	C	?	1563	Add. MS. 37632
UKL21.	Joan Martines	C	Messina	1564	Add. MS. 17540
UKL22.	Battista Agnese	A8	Venice	1564	Add. MS. 25442
UKL23.	Joan Martines	A7	Messina	1567	Add. MS. 15714
UKL24.	Jacopo Russo	C	Messina	1570	Eg. 2799
UKL25.	Diogo Homem	C	Venice	1570	Eg. 2858
UKL26.	Joan Martines	A7	Messina	1578	Harl. 3489
UKL27.	Joan Martines	A18	Messina	[16th cent.]	Harl. 3450
UKL28.	Joan Martines	A6	Messina	1579	Add. MS. 22018
UKL29.	Joan Martines	A7	Messina	1582	Add. MS. 5019
UKL30.	Joan Riczo Oliva	C	Naples	1587	Add. MS. 9811
UKL31.	Johannes Me Lisa	C	?	1591	Eg. 988
UKL32.	Joan Oliva	C	Messina	1599	Add. MS. 24043
UKL33.	Anonymous	A3	?	[17th cent.]	Add. MS. 11549
UKL34.	Anonymous	C	?	[17th cent.]	Eg. 3359
UKL35.	Anonymous (French)	A17	[Marseilles ?]	[17th cent.]	K.Mar.IV.37
UKL36.	Anonymous	C	?	[17th cent.]	Add. MS. 9813
UKL37.	Joan Oliva	A10	Marseilles	1613	Eg. 819
UKL38.	Joan Oliva	A2	Leghorn	1623	Eg. 2861
UKL39.	Giovanni Francesco Monno	C	Genoa	1629	Add. MS. 31319
UKL40.	Joan Oliva	A20	Leghorn	1638	K.Mar.I.1
UKL41.	Giovanni Battista Cavallini	A2	Leghorn	1642	Add. MS. 19976
UKL42.	Giovanni Battista Cavallini	A6	Leghorn	1642	Add. MS. 22618
UKL43.	"Franciscus Caloiro Oliva"	A4	Marseilles	1643	Add. MS. 15125
UKL44.	Giovanni Battista Cavallini	A8	Leghorn	1644	Add. MS. 11765
UKL45.	Alberto de Stefano	A14	Genoa	1645	Add. MS. 19511
UKL46.	François Ollive	A5	Marseilles	1650	Add. MS. 17276
UKL47.	Pietro Cavallini	A5	Leghorn	1669	Add. MS. 10133
London, Admiralty Library					
UKL48.	[Battista Agnese]	A?	[Venice]	[16th cent.]	Va. 1
UKL49.	Joan Martines	A6	Messina	1579	Va. 3
UKL50.	[Augustin ?] Roussin	A3	Toulon	1645	Va. 2

APPENDIX 7.1 (*continued*)

London, Lambeth Palace Library					
UKL51.	[Battista Agnese]	A12	[Venice]	[16th cent.]	38, 4 to 199
London, Royal Geographical Society					
UKL52.	[Battista Agnese]	A13	[Venice]	[16th cent.]	
UKL53.	Anonymous (French)	A2[55]	[Marseilles ?]	[17th cent.]	
UKL54	Anonymous (Italian)	C[56]	?	[16th cent.]	
Oxford, Bodleian Library, University of Oxford					
UKO1.	Bartomeu Olives	A5	Venice	1559	MS. Can. Ital. 143
UKO2.	Bartomeu Olives	C	Messina	1575	MS. C 2: 7 (23)
UKO3.	Anonymous	A7	?	?	MS. Dance 390
UKO4.	[Joan Martines]	A4	?	[16th cent.]	MS. Rawlinson B 256
UKO5.	[Joan Martines]	A9	?	[16th cent.]	MS. Douce 391
UKO6.	[Battista Agnese]	A7	[Venice]	[16th cent.]	MS. Can. Ital. 144
UKO7.	[Battista Agnese]	A7	[Venice]	[16th cent.]	MS. Can. Ital. 142
UKO8.	[Francesco Ghisolfi]	A12	?	[16th cent.]	Broxb. 84.4/R1598
UKO9.	[Placido Caloiro e Oliva]	A3	[Messina]	[17th cent.]	MS. Can. Ital. 140
UNITED STATES OF AMERICA					
Arlington, University of Texas at Arlington Library					
USA1.	[Battista Agnese]	C[57]	[Venice]	[16th cent.]	85-283 @ 50/1
Boston, Boston Public Library					
USB1.	Augustin Roussin	A6	Marseilles	[17th cent.]	MS. F. Fr. 180
Cambridge, Harvard College Library					
USCa1.	Salvatore Oliva	A3	Marseilles	1620	MA 5315 620
Cambridge, Harvard University, Houghton Library					
USCa2.	Vesconte Maggiolo	C	Naples	1513	*51M-311 PF
Chicago, The Newberry Library					
USCh1.	[Battista Agnese]	A6	[Venice]	[16th cent.]	Ayer MS. 10
USCh2.	[Battista Agnese]	A15	[Venice]	[16th cent.]	Ayer MS. 12
USCh3.	[Battista Agnese]	A9	[Venice]	[16th cent.]	Ayer MS. 13
USCh4.	Conte di Ottomanno Freducci	A5	Ancona	1533	Ayer MS. 8
USCh5.	Antonio Millo	C	[Venice]	1567	Ayer MS. 15
USCh6.	Domingo Olives	C	Naples	1568	Ayer MS. 16
USCh7.	Joan Martines	A5	Messina	1583	Ayer MS. 21
USCh8.	Carlo da Corte	C	Genoa	1592	Ayer MS. 23
USCh9.	Joan Oliva	A6	Messina	1594	Ayer MS. 24
USCh10.	Vincenzo Volcio	C	Leghorn	1595	Ayer MS. 25
USCh11.	Hieronimo Masarachi	C	?	[16th cent. ?]	Novacco 2R1
USCh12.	Baldassare Maggiolo	C	Genoa	1600	Ayer MS. 27
USCh13.	Joan Oliva and Giovanni Battista Cavallini	A6	Leghorn	1636	Ayer MS. 29
USCh14.	Placido Caloiro e Oliva	A4	Messina	1641	Ayer MS. 33
USCh15.	Anonymous (Catalan)	A2	?	[17th cent.]	Ayer MS. 34
USCh16.	Anonymous (French)	A13	[Marseilles ?]	[17th cent.]	Ayer MS. 11

55. Chart of Sicily.
56. Chart of the eastern Mediterranean.
57. Fragment of a sheet from an atlas.

APPENDIX 7.1 (*continued*)

USCh17.	Anonymous (French)	A5	[Marseilles ?]	[17th cent.]	Ayer MS. 35
USCh18.	[Francesco Ghisolfi]	A7	?	[17th cent.]	Novacco 6 C 1
USCh19.	Gasparo Tentivo	A4[58]	Venice	1661	Novacco 7 C 1
Cincinnati, Hebrew Union College–Jewish Institute of Religion, Klau Library					
USCi1.	Jehuda ben Zara	C	Alessandria	1500	
New Haven, Yale University, Beinecke Rare Book and Manuscript Library					
USNH1.	Jehuda ben Zara	C	Safad	1505	*30 cea 1505
USNH2.	[Vesconte Maggiolo ?]	C	[Genoa ?]	[16th cent.]	1980. 156
USNH3.	Joan Riczo Oliva	C	Naples	15[??]	*30 cea 1555
USNH4.	Jaume Olives	C	Naples	1563	*30 cea 1563
USNH5.	Joan Riczo Oliva	C	Naples	[1587 ?]	*49 cea 1587
USNH6.	Joan Riczo Oliva	C	Messina	1594	*49 cea 1594
New Haven, Yale University, Sterling Memorial Library					
USNH7.	Conte di Ottomanno Freducci	A4	[Ancona]	1536	*49 + 1536
USNH8.	Jacopo Maggiolo	C	Genoa	1553	*49. 1553
USNH9.	Domenico Vigliarolo	C	Palermo	1577	*49. 1577
USNH10.	Joan Riczo Oliva	C	Messina	1590	*49. 1590
USNH11.	Anonymous (Catalan)	C[59]	?	[16th cent.]	*32 cea 1550
USNH12.	Vincenzo Volcio	C	Leghorn	1601	*49 cea 1601
USNH13.	Joan Oliva	A1[60]	Leghorn	1643	*11. 1643
USNH14.	Anonymous (French)	A1[61]	[Marseilles ?]	[17th cent.]	*488. 1550
USNH15.	Anonymous (French)	C	[Marseilles ?]	[17th cent.]	Roll Map *49. 1600
New York, Brooklyn Museum					
USNY1.	Anonymous (Greek)	A7	?	[16th cent.]	36.203. 1-7
New York, Columbia University, Butler Library					
USNY2.	Joan Oliva	A5	[Messina?]	[16th or 17th cent.]	
New York, Hispanic Society of America					
USNY4.	Vesconte Maggiolo	C	Naples	1512	K33
USNY5.	Conte di Ottomanno Freducci	C	Ancona	1524	K24
USNY6.	Conte di Ottomanno Freducci	A5	Ancona	1537	K14
USNY7.	[Battista Agnese]	A14	[Venice]	[16th cent.]	K13
USNY8.	Anonymous (Catalan)	C	?	[16th cent.]	K28
USNY9.	Bartomeu Olives	C	Palermo	[16th cent.]	K16
USNY9bis.	Bartomeu Olives	C	?	1552	K34
USNY10.	[Pietro Cavallini]	C	[Leghorn]	[17th cent.]	K23
USNY11.	[Giovanni Battista Cavallini ?][62]	A5	[Leghorn]	[17th cent.]	K47
USNY12.	Joan Martines	A7	[Messina]	1562	K20
USNY13.	Joan Martines	A5	Messina	1582	K31
USNY14.	Jaume Olives	A6	Naples	1563	K30

58. Four nautical charts inserted in the portolan "Il Nautico Ricercato."
59. Fragment of a nautical chart.
60. Loose sheet (world chart) from an atlas.
61. Loose sheet (Aegean Sea) from an atlas.
62. Part of an atlas.

APPENDIX 7.1 (*continued*)

USNY15.	Jaume Olives	C	Marseilles	1566	K41
USNY16.	[Domenico Vigliarolo]	A7	[Naples]	[16th cent.]	K18
USNY17.	Vicente Prunes	C	Palma de Mallorca	1597	K29
USNY18.	Vincenzo Volcio	C	Leghorn	1600	K11
USNY19.	Baldassare Maggiolo	C	Genoa	1605	K12
USNY20.	Joan Oliva	C	Leghorn	?	K8
USNY21.	Placido Caloiro e Oliva	C	Messina	[17th cent.]	K27
USNY22.	Giovanni Battista Cavallini	C[63]	Leghorn	1637	K2
USNY23.	Giovanni Battista Cavallini	A2	Leghorn	1643	K40
USNY25.	[Francesco Oliva and Joan Oliva]	C	[Messina]	[17th cent.]	K5
USNY26.	[Francesco Oliva]	A3	[Messina]	[17th cent.]	K21
USNY27.	[François Ollive]	A3	[Marseilles]	[17th cent.]	K9
USNY28.	[François Ollive]	A4	[Marseilles]	[17th cent.]	K10
USNY29.	[François Ollive]	A3	[Marseilles]	[17th cent.]	K17
USNY30.	[François Ollive]	A2 ?[64]	[Marseilles]	[17th cent.]	K25 e K26
USNY31.	Jean François Roussin	A2	Venice	1673	K48
New York, New York Historical Society					
USNY3.	[Giovanni Battista Cavallini]	A8[65]	[Leghorn]	[16th cent.]	
New York, New York Public Library					
USNY32.	[Battista Agnese]	A15	[Venice]	[16th cent.]	
New York, Pierpont Morgan Library					
USNY33.	Battista Agnese	A10	Venice	1542	M 507
USNY34.	[Battista Agnese]	A10	[Venice]	[16th cent.]	M 506
Princeton, Princeton University Library					
USPr1.	Jaume Olives	A ?	Palma de Mallorca	[16th cent.]	Grenville Kane Coll.
Portland (Maine), University of Southern Maine, Osher Map Library					
USPl1.	Bartomeu Olives	C	Messina	1583	
Providence (Rhode Island), John Carter Brown Library, Brown University					
USPo1.	Vesconte Maggiolo	A10	Naples	1511	
USPo2.	[Battista Agnese]	A11	[Venice]	[16th cent.]	
USPo3.	[Francesco Ghisolfi]	A12	?	[16th cent.]	
USPo4.	Hercules [o] Doria	A9	Marseilles	1592	
San Marino (California), Huntington Library					
USSM1.	Vesconte Maggiolo	C	Naples	1516	HM452
USSM2.	Battista Agnese	A10	Venice	1553	HM27
USSM3.	[Battista Agnese]	A16	[Venice]	[16th cent.]	HM10
USSM4.	[Battista Agnese]	A10	[Venice]	[16th cent.]	HM25
USSM5.	[Battista Agnese]	A11	[Venice]	[16th cent.]	HM26
USSM6.	[Francesco Ghisolfi]	A11	?	[16th cent.]	HM28
USSM7.	Joan Oliva	C	Naples	1602	HM40

63. On the atlas one reads "Mapa de Hieronimo de Girava Tarraconensis Milano 1567." The work, however, is certainly of a much later date, and in my opinion is the work of Giovanni Battista Cavallini.

64. Loose sheet from an atlas.

65. Two fragments from the same atlas.

APPENDIX 7.1 (*continued*)

USSM8.	[Bartomeu Olives]	A14	[Palma de Mallorca ?]	[16th cent.]	HM32
USSM9.	[Joan Martines]	A14	[Messina]	[16th cent.]	HM33
USSM10.	Anonymous (Catalan)	A2	[Palma de Mallorca ?]	[16th cent.]	HM42
USSM11.	Anonymous (French)	A6	[Marseilles ?]	[17th cent.]	HM34
USSM12.	Salvatore Oliva	A2[66]	Marseilles	1619	HM2515
USSM13.	Estienne Bremond	A1	Marseilles	1655	HM31
USSM14.	Jean François Roussin	A3	Venice	1661	HM37
USSM15.	Pietro Cavallini	A6	Leghorn	1677	HM38
Washington, D.C., Library of Congress					
USW1.	[Battista Agnese]	A10	[Venice]	[16th cent.]	Port. Ch. 5
USW2.	Jaume Olives	C	Marseilles	1550	Port. Ch. 6
USW3.	Matteo Prunes	C	Palma de Mallorca	1559	Port. Ch. 7
USW4.	[Joan Oliva]	A5	?	[16th cent.]	Port. Ch. 8
USW5.	Jacopo Scotto	A8	?	[16th cent.]	Port. Ch. 11
USW6.	Anonymous	C	?	[16th cent.]	Port. Ch. 12
USW7.	Anonymous	C	?	[16th cent.]	Port. Ch. 13
USW8.	Placido [Caloiro e Oliva ?]	C	[Messina]	[17th cent.]	Port. Ch. 14
USW9.	Giovanni Battista Cavallini	A2	Leghorn	1640	Port. Ch. 17
USW10.	Jean André Bremond	A5	Marseilles	1670	Port. Ch. 19
USW11.	[Pietro ?] Cavallini	C	Leghorn	1678	Port. Ch. 20
VATICAN					
Vatican City, Biblioteca Apostolica Vaticana					
V1.	Andrea Benincasa	C	Ancona	1508	Borgiano VIII
V2.	Anonymous	C[67]	?	[16th cent.]	Borgiano II
V3.	Conte di Ottomanno Freducci	A5	Ancona	1538	Borgiano XIII
V4.	[Battista Agnese]	A8	[Venice]	[16th cent.]	Cod. Vat. Lat. 7586
V5.	[Battista Agnese]	A7	[Venice]	[16th cent.]	Cod. Barb. Lat. 4431A
V6.	Battista Agnese	A11	Venice	1542	Cod. Palat. Lat 1886
V7.	[Battista Agnese]	A10	[Venice]	[16th cent.]	Cod. Barb. Lat. 4357
V7bis.	[Battista Agnese]	A10	[Venice]	[16th cent.]	Cod. Barb. Lat. 4313
V8.	Anonymous	A10	[Venice ?]	[16th cent.]	Cod. Rossiano 214
V9.	[Bartomeu Olives]	A14	?	[16th cent.]	Cod. Urb. Lat. 283
V10.	Diogo Homem	C	[Venice ?]	[16th cent.]	Cod. Barb. Lat.4431B
V11.	[Diogo Homem]	A7	[Venice ?]	[16th cent.]	Cod. Barb. Lat. 4394
V12.	Joan Martines	C	Messina	1586	Borgiano X
V13.	[Joan Martines]	A4	[Messina]	[16th cent.]	Cod. Urb. Lat. 1710
V14.	[Joan Martines]	A4	[Messina]	[16th cent.]	Cod. Vat. Lat. 8920
V15.	Anonymous	C	?	[16th cent.]	Borgiano IV
V15bis.	Anonymous	C	?	[16th cent.]	Borgiano V
V16.	Anonymous	C	?	[16th cent.]	Borgiano VI
V17.	Vincenzo Volcio	C	Naples	1605	Cod. Vat. Lat. 14208
V18.	Anonymous	C	[Venice ?]	[17th cent.]	Borgiano IX
V19.	Anonymous	C	?	[17th cent.]	Borgiano XI
V20.	Anonymous	A5	?	[17th cent.]	Cod. Vat. Lat. 9339

66. Bound together with the map/chart of Estienne Bremond.
67. Nautical world chart.

(*continued*)

APPENDIX 7.1 (*continued*)

Index of Cartographers

Battista Agnese: AW1, AW2, AW3, FrC1, FrMo1, FrP8, FrP9, FrP10, FrP11, FrP12, GeB6, GeD1, GeD2, GeG1, GeGo1, GeKa1, GeM2, GeM7, GeW1, GeW2, IrD1, ItBe1, ItBo11, ItBs1, ItCt1, ItFi13, ItFi14, ItFi24, ItGe12, ItMi1, ItMi6, ItNa1, ItPr1, ItTo5, ItTo6, ItVe9, ItVe13, ItVe25, ItVe26, ItVe27, ItVe28, ItVe29, JT1, NG3, PL1, RP1, RP2, SpM2, SvS3, SwZ1, UKBe1, UKG1, UKGr5, UKGr6, UKL10, UKL11 UKL13, UKL14, UKL22, UKL48, UKL51, UKL52, UKO6, UKO7, USA1, USCh1, USCh2, USCh3, USNY7, USNY32, USNY33 USNY34, USPo2, USSM2 USSM3, USSL4, USSM5, USW1, V4, V5, V6, V7, V7bis

Charlat Ambroisin: FrP37

Andrea Benincasa: V1

"Angelus": ItFi22

Bartolomeo Bonomi: ItRo19

Estienne Bremond: USSM13, UKC2

Jean André Bremond: FrP60, ItMi4, ItTs2, USW10

Placido Caloiro: ItBo6

"Franciscus Caloiro Oliva": UKL43

Giovanni Battista Caloiro e Oliva: ItNa6, ItNa8

Placido Caloiro e Oliva: CrD1, FrP39, ItBo5, ItBo12, ItBo13, ItCe1, ItFi4, ItFi32, ItGe7, ItMi7, ItNa5, ItNa7, ItPa3, ItRo9, ItRo12, ItRv3, ItRv4, ItSv1, ItTs4, ItVe21, ItVe48, ItVe49, ItVi1, ItVi2, ItVo1, UKGr17, UKO9, USCh14, USNY21, USW8

Thomas Caulet: SwS1

Giovanni Battista Cavallini: FiH5, FrP44, ItFi28, ItFi35, ItGe15, ItRo17, ItPr8, NG4, SpP8, UKGr21, UKL41, UKL42, UKL44, USCh14, USNY11, USNY22, USNY23, USW9

Pietro Cavallini: ItFi5, ItPr8, ItPi3, UKL47, USNY10, USSM15, USW11

Nicolò de Caverio: FrP2

Aloisio Cesani: ItPr5

Pierre Collin: FrL1

Sebastiano Condina: ItVe5

Carlo da Corte: USCh8

Gerolamo Costo: ItGe14

Rocco Dalolmo: ItSi1

Hercules [o] Doria: USPo4

Jacques Dousaigo: UKGr10

Marco Fassoi: ItVe14, ItVe55

Reinaut Barthollomiu de Ferrieros: ItFi9

Filippo Francini: AW9

Angelo Freducci: BB2, ItMa2, ItRo10, UKGr4, UKGr7

Conte di Ottomanno Freducci: ItBo2, ItFi7, ItL1, ItPe1, NG2, UKL9, UKL12bis, USCH4, USNH7, USNY5, USNY6, V3

Francesco Ghisolfi: AW6, FrP20, ItFi29, ItFi30, ItGe2, ItNa2, MM1,UKO8, USCh18,USPo3,USSM6

Alvise Gramolin: FrP38, ItVe2, ItVe47

Mateo Griusco: ItPr6

Nicolò Guidalotti: ItVe7

Diogo Homem: FrP16, FrP18, GeD3, ItRo7, UKL25, V10, V11

Annibale Impuccio: ItVr3, ItVr4

Baldassare Maggiolo: FrP26, ItFi23, SpM9, USCh12, USNY19

Giovanni Antonio Maggiolo: AW4, ItCa2, ItPr3

Jacopo Maggiolo: FrP13, FrP14, FrP17, GeM3, ItFi33, ItGe1, ItGe9, ItMi2, ItRo4, ItRo6, ItRo11, ItVe36, UKL18, USNH8

Vesconte Maggiolo: CaM1, FrP12, FrP58, GeM1, ItFa1, ItFi20, ItPr2, ItPr3, ItPs1, ItTo2, ItTr1, NA1, SpM1, UKGr1, UKGr2, UKL7, UKL8, USCa2, USNH2, USNY4, USPo1, USSM1

Joan Martines: AW5, FrP1, FrP19, FrP21, GeB3, ItBr1, ItCo1, ItFi15, ItGe10, ItMi3, ItRo1,ItTo3, ItTo8, ItVe16, ItVe38, SpM3, SpM10, SpM12, SpM13, UKC1, UKGr3, UKGr9, UKL1, UKL2, UKL16, UKL21, UKL23, UKL26, UKL27, UKL28, UKL29, UKL49, UKO4, UKO5, USCh7, USNY12, USNY13, USSM9, V12, V13, V14

Hieronimo Masarachi: USCh11

Johannes Me Lisa: UKL31

Antonio Millo: AW7, GeB2, ItRo8, ItVe37, USCh5

Giovanni Francesco Monno: ItGe3, ItRo16, UKL39

Francesco Oliva: AW8, FrP31, FrP32, FrP33, ItVe56, MaV1, SpBa7, UKGr14, USNY25, USNY26

Joan Oliva: CeO1, CeO2, CyN1, DK1, FrP21, FrP32, FrP33, FrP34, FrP35, ItBo1, ItCa3,ItFi17, ItFi27, ItFi34, ItNa4, ItPa1, ItPr7, ItPc1, ItPi1, ItPo1, ItRi1, ItVe57, SpBa3, SpM16, SpP5, SpP6, SpP7, SvS4, UKGr12, UKGr18, UKGr19, UKL32, UKL37, UKL38, UKL40, USCh9, USNH13, USNY2, USNY20, USNY25, USSM7, USW4

Joan Riczo Oliva: FrMa1, FrP27, SpM8, UKL30, USNH3, USNH5, USNH6, USNH10

Placido Oliva: ItFi12

Salvatore Oliva: FrP30, FrP40, FrP42, FrP43, ItFi16, ItVe18, USCa1, USSM12

Olives: ItFi21

Bartomeu Olives: BB1, FrH1, FrP22, ItFi31, ItPi4, ItVe1, ItVe43, SpBa2, UKL20, UKO1, UKO2, USNY9, USPl1, USSM8, V9

Domingo Olives: FiH1, USCh6

Jaume Olives: CeO3, FrV1, ItMi2ter, ItNa3, ItPv1, ItRo5, ItRo14, ItVe41, ItVe42,ItVr2, SpBa4,SpP3, SpP4,UKL15, USNH4, USNY14, USNY15, USPr1, USW2

Brasito Olivo: ItVe6

François Ollive: DH1, FrMa3, FrMa4, FrP48, FrP50, FrP51, FrP52, FrP53, FrP54, FrP55, FrP61, ItTr3, ItVe8, ItVe10, SpBa8, SpBi2, UKE2, UKL46, USNY27, USNY28, USNY29, USNY30

Banet Panades: ItBo9, ItGe8

Giulio Petrucci: ItBo10, ItMo3, UKGr8

Salvat de Pilestrina: ItMa1, SpT1

Juan Bautista Prunes: FrP45

Matteo Prunes: FrP23, FrP24, ItCv1, ItFi9, ItGe11, ItSi2, ItSi3, ItVe39, ItVe40, SpM11, USW3

Michel Prunes: SpP9

(Père) Juan Prunes: ItCo2, ItVe52

Vicente Prunes: ItGe13, SpBa6, USNY17

Augustin Roussin: FiH6, FrMa2, FrP41, FrT1, UKL50, USB1

Jean François Roussin: FrMa5, FrP46, FrP47, FrP49, FrP59, ItMo4, ItTo10, ItTo11, ItTr2, ItTr4, ItVe54, SvS5, USNY31, USSM14, USW10

Jacopo Russo: ItCa2, ItFi1, ItFi6, ItMo2, ItPr4, ItRo3, ItTo7, NG1, SpP2, SpV1,UKBi1, UKL5, UKL12, UKL24

Pietro Russo: FrP5, FrP6, SpBa1

Guglielmo Saetone: ItA1, ItMi5

Giacomo Scotto: ItBo3, ItVe3, ItVr1, USW5

Giorgio Sideri (Il Callapoda): FrP15, ItVe11, ItVe12, ItVe31, ItVe32, ItVe33, ItVe34, ItVe35, SvS1, UKE1, UKL19

APPENDIX 7.1 (*continued*)

Giovanni Girolamo Sosuich: ItPi2

Alberto de Stefano: UKGr20, UKL45

Gasparo Tentivo: ItVe22, USCh19

Trophème Vernier: ItBo7

Domenico Vigliarolo (Domingo Villaroel): GeB1, FrP25, SpM15, USNH9, USNY16

Vincenzo Volcio: FiH2, FrP28, ItBo4, ItFi11, SpM4, USCh10, USNH12, USNY10, V17

Nicolaus Vourdopolos: FrP36

Giovanni Xenodocos: ItVe24

Jehuda ben Zara: USC1, USNH1

Index by Place of Production

Albissola: ItA1, ItMi5

Alessandria: USCi1

Ancona: BB2, ItBo2, ItFi7, ItMa2, ItPe1, ItRo10, ItRo19, ItSi1, NG2, UKGr4, UKGr7, UKL9, UKL12bis, USCh4, USNH7, USNY6, USNY7, V1, V3

Barcelona: FrV1, ItGe14, SpP4

Civitavecchia: ItVe3, ItVr1

Crete: ItVe12

Genoa: AW4, CaM1, FrP2, FrP3, FrP4, FrP5, FrP12, FrP13, FrP14, FrP17, FrP26, FrP58, GeM1, GeM3, ItCa2, ItFi20, ItFi23, ItFi33, ItGe1, ItGe3, ItGe9, ItMi2, ItPr3, ItPs1, ItRo4, ItRo6, ItRo11, ItRo16, ItTo2, ItTr1, ItVe36, SpM1, UKGr1, UKGr2, UKGr20, UKL7, UKL8, UKL18, UKL39, UKL45, USCh8, USCh12, USNH2, USNH8, USNY19

Leghorn: CeO1,CeO2, FiH5, FrP28, FrP44, ItBo4, ItCa3, ItFi5, ItFi17, ItFi28, ItFi35, ItGe15, ItPr8, ItPc1, ItPi3, ItPo1, ItRi1, ItRo17, NG4, SpP7, SpP8, SvS4, UKGr18, UKGr19, UKGr21, UKL38, UKL40, UKL41, UKL42, UKL44, UKL47, USCh10, USCh13, USNH12, USNH13, USNY3, USNY10, USNY11, USNY18, USNY20, USNY22, USNY23, USSM15, USW9, USW11

Malta: ItFi3

Marseilles: DH1, FiH6, FrL1, FrMa2, FrMa3, FrMa4, FrP37, FrP40, FrP41, FrP42, FrP43, FrP46, FrP48, FrP50, FrP51, FrP52, FrP53, FrP54, FrP55, FrP56, FrP57, FrP60, FrP61, FrT1, GrA1, ItBo7, ItBo8, ItFi16, ItFi22, ItMi4, ItNa4, ItTo10, ItTo112, ItTr2, ItTr3, ItTs2, ItVe8, ItVe10, ItVe18, ItVe42, ItVe57, ItVe58, JK1, SpBa8, SpBi2, SvS5, SwS1, UKC2, UKE2, UKGr13, UKL35, UKL37, UKL43, UKL46, UKL53, USB1, USCa1, USCh16, USCh17, USNH14, USNH15, USNY15, USNY27, USNY28, USNY29, USNY30, USPo4, USSM11, USSM12, USSM13, USW2, USW10

Messina: AW5, AW8, BB1, CrD1, DK1, FrMa1, FrP1, FrP19, FrP21, FrP22, FrP27, FrP29, FrP31, FrP32, FrP33, FrP39, GeB3, ItBo1, ItBo5, ItBo6, ItBo12, ItBo13, ItCa1, ItCe1, ItCo1, ItFi1, ItFi2, ItFi4, ItFi6, ItFi12, ItFi15, ItFi27, ItFi31, ItFi32, ItGe7, ItGe8, ItGe10, ItMi3, ItMo2, ItNa3, ItNa5, ItNa6, ItNa7, ItNa8, ItPa1, ItPa3, ItPr4, ItPr7, ItPv1, ItPi4, ItRo1, ItRo3, ItRo5ItRo9, ItRo12, ItRo14, ItRv3, ItRv4, ItSv1, ItTo3, ItTo7, ItTo8, ItTs4, ItVe4, ItVe6, ItVe16, ItVe21, ItVe38, ItVe43, ItVe48, ItVe49, ItVe56, ItVr2, ItVr5, ItVi1, ItVi2, ItVo1, MaV1, NG1, SpBa1, SpBa3, SpBa7, SpM3, SpM10, SpM12, SpM13, SpM16, SpP2, SpP5, SpP6, SpV1, UKB1, UKC1, UKGr3, UKGr9, UKGr12, UKGr14, UKGr17, UKL5, UKL12, UKL15, UKL21, UKL23, UKL24, UKL26, UKL27, UKL28, UKL29, UKL32, UKL49, UKO2, UKO9, USCh7, USCh9, USCh14, USNH6, USNH10, USNY2, USNY12, USNY13, USNY21, USNY25, USNY26, USPl1, USSM9, USW8, V12, V13, V14

Naples: FiH1, FiH2, FrP25, GeB1, ItBo3, ItBr1, ItFi11, ItPr2, ItPi1, ItVe5, ItVe41, ItVr3, ItVr4, NA1, SpM4, SpM8, SpM15, SpP3, UKGr10, UKL30, USCa2, USCh6, USNH3, USNH4, USNH5, USNY4, USNY14, USNY16, USPo1, USSM1, USSM7, V17

Palermo: ItBo9, USNH9, USNY9

Palma de Mallorca: CeO3, FrP23, FrP24, FrP45, ItCv1, ItCo2, ItFi9, ItGe11, ItGe13, ItPr6, ItSi2, ItSi3, ItVe1, ItVe39, ItVe40, ItVe52, SpBa2, SpBa6, SpM11, SpT1, USNY17, USPr1, USSM8, USSM10, USW3

Pisa: ItBo10, ItMo3,

Rome: FiH3

Safad: USNH1

Siena: UKGr8

Toulon: FrP47, FrP59, ItMo4, UKL50

Venice: AW1, AW2, AW3, AW7, AW9, BB3, FrC1, Fr.Ma5, FrMo1, FrP7, FrP8, FrP9, FrP10, FrP11, FrP15, FrP16, FrP18, FrP38, FrP49, GeB2, GeB6, GeGo1, GeD1, GeD2, GeD3, GeG1, GeGo1, GeKa1, GeM2, GeM7, GeW1, GeW2, IrD1, ItBe1, ItBo11, ItBs1, ItCt1, ItFi13, ItFi14, ItFi24, ItGe11,ItMi1, ItMi6, ItNa1, ItPr1, ItRo7, ItRo8, ItTo5, ItTo6, ItTo9, ItTo11, ItTr4, ItTs1, ItVe2, ItVe7, ItVe9, ItVe11, ItVe13, ItVe14, ItVe15, ItVe22, ItVe23, ItVe24, ItVe25, ItVe26, ItVe27, ItVe28, ItVe29, ItVe30, ItVe31, ItVe32, ItVe33, ItVe34, ItVe35, ItVe37, ItVe47, ItVe54, ItVe55, JT1, NG3, PL1, RP1, RP2, SpM2, SvS2, SvS3, SwZ1, UKBe1, UKE1, UKG1, UKGr5, UKGr6, UKL10, UKL11, UKL13, UKL14, UKL19, UKL25, UKL48, UKL51, UKL52, UKO1, UKO6, UKO7,USA1, USCh1, USCh2, USCh3, USCh5, USCh19, USNY7, USNY31, USNY32, USNY33, USNY34, USPo2, USSM2, USSM3, USSM4, USSM5, USSM14, USW1, V4, V5, V6, V7, V7bis, V8, V10, V11, V18

appendix 7.2 Members of the Oliva and Caloiro e Oliva Dynasty with the Cities Where They Worked and the Years

Bartomeu Olives	
Palma de Mallorca	1538
Venice	1559–62
Messina	1572–88
Palermo	?
Jaume Olives	
Marseilles	1550
Messina	1552–61
Naples	1562–64
Marseilles	1566
Barcelona	1571–72
Domingo Olives (son of Jaume)	
Naples	1568
Joan Riczo Oliva (son of Domingo)	
Naples	1580–88
Messina	1590–94
Joan Oliva	
Messina	1592–99
Naples	1601–3
Messina	1606–8
Malta	1611
Marseilles	1612–14
Messina	1614
Marseilles	1615
Leghorn	ca. 1616–43
Francisco Oliva (brother of Joan)	
Messina	1594–1615
Placido Oliva	
Messina	1615
Salvator Oliva	
Marseilles	1619–35
Brasito Olivo	
Messina	1633
François Ollive	
Marseilles	1650–64
Placido Caloiro e Oliva	
Messina	1617–57
“Franciscus Caloiro Oliva”	
Marseilles	1643
Placido Caloiro	
Messina	1665
Giovanni Battista Caloiro e Oliva	
Messina	1673