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DIFFUSION OF SKILL IN THE MEDITERRANEAN WORLD.  
OTTOMAN NAVIGATIONAL TECHNOLOGY  
DURING THE 16<sup>TH</sup> CENTURY  
SEEN THROUGH SAILING-DIRECTIONS MANUALS

A Master's Thesis

By

DIMITRIOS LOUPIS

145545

DEPARTMENT OF HISTORY  
BILKENT UNIVERSITY  
ANKARA  
September 2004

To my mother



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THE INSTITUTE OF ECONOMICS AND SOCIAL SCIENCES  
OF  
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by

DIMITRIOS LOUPIS

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in

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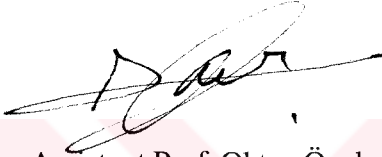
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Assistant Prof. Mehmet Kalpaklı  
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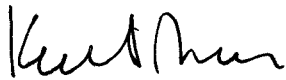
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## ABSTRACT

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This thesis deals with the navigational technology, focusing on the sailing-directions texts, of the Ottomans during the 16<sup>th</sup> century. It is divided into four chapters, the first of which discusses in general the development of the science and technique of navigation in the Mediterranean Sea from the Antiquity to the 16<sup>th</sup> century. The subject of the study is the technology that has to do with the orientation and not with the ship-building at all. A brief reference on the instruments used on ship board follows, while the chapter ends with the distinction between the astronomical and the plane navigation. The second chapter displays the Mediterranean world as a unity, where all sorts of exchange and interaction took place. Thus, the art of navigating the sea, that both unites and divides the shores around it, was one of the main features of the cultural exchange. The mariners of the enclosed sea shared a common life in the waters no matter their ethnic and

religious provenance. Here the common language of the seamen, the “lingua franca” is under consideration. The third chapter discusses the sailing-directions text that were compiled in various languages again from the Antiquity to the 16<sup>th</sup> century, while the fourth and last chapter is concentrated on the three known 16<sup>th</sup>-century Ottoman texts of this genre.

The Ottomans, as well as other Mediterranean groups, were in the periphery of the navigational technology according to the results of the study. They produced a small number of original texts, nevertheless they took part in the diffusion of the navigational know-how.

Keywords: navigation, navigational technology, sailing-directions texts, Piri Reis,  
Hacı Muhammed Reis

## ÖZET

### AKDENİZ DÜNYASINDA BECERİNİN YAYILMASI. 16. YY.'DA OSMANLI DENİZCİLİK TEKNOLOJİSİ OLARAK DENİZ KILAVUZLARI

Loupis, Dimitrios

Yüksek Lisans, Tarih Bölümü

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Bu tez Osmanlılar'ın 16. yy'da denizcilik teknolojisi, özellikle deniz kılavuzları üretimine katkısını incelemektedir. Tez dört bölümden oluşmaktadır. Birinci bölümde genellikle eski çağlardan 16. yüzyıla kadar Akdeniz'de denizcilik bilim ve tekniği gelişmesi ele alınıyor. Bu araştırmanın asıl konusu yönlendirmeye ilgili teknolojidir, gemi inşaatı konusuna değinmemiştir. Gemide kullanılan aletler hakkında kısa bir tanımlama verilmiştir. Bu bölüm, astronomik ve yüzeysel denizcilik terimlerinin açıklamasıyla sona ermektedir. İkinci bölümde her karşılıklı değişme ve etkileşimin gerçekleştiği bölge gibi Akdeniz dünyası bir bütün olarak inceleniyor. Böylece, denizcilik sanatı kültür değişmesinin baş özelliklerinden biri oluyor. Etnik ve dinsel kökene önem vermeden o kapalı denizin denizcileri sularda ortak bir hayat yaşıyorlardı. Bu bölümde denizcilerin ortak şivesi (Lingua Franca)'dan bahsediliyor. Üçüncü bölümde eski çağlardan 16. yüzyıla kadar Akdeniz'de diğer dillerinde üretilen deniz kılavuzları inceleniyor. Dördüncü ve son bölüm 16.yy'da Osmanlıca yazılan o tür metinlerini takdim ediyor.

Bu arařtırmanın sonuçlarına gre, Osmanlılar, diđer birkaç Akdeniz grubu ile, denizcilik teknolojisinin merkezinde deđil, onun evresinde bulunmuřlardı. Onlar orijinal olarak az miktarda metin retti, ama denizcilik bilgisinin yayılmasına katıldılar.

Anahtar Kelimeler: denizcilik, denizcilik teknolojisi, deniz kılavuzları, Piri Reis,

Hacı Muhammed Reis





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## INTRODUCTION

The study of the history of technology or history of science has gained field during the recent decades, while attracted the interest of not only historians, but also scholars from the positive sciences. Although, there were a few sporadic studies on the Ottoman world of technology published since the 1930's, the research was intensified during the last twenty years. Nevertheless, this field, among others in Ottoman historiography, needs more thorough and long effort in order to acquire the scheme of the development of science, scientific methods and practice within the time limits of the Ottoman period.

Some twenty years after the publication of an unsurpassable article by Franz Taeschner on Ottoman geography,<sup>1</sup> the fundamental work by Adnan Adıvar *Osmanlı Türklerinde ilim* appeared in the 1940's.<sup>2</sup> It served the field well for quite a long period, nevertheless, during the almost seven decades that passed since, a great amount of new knowledge has been accumulated. The two works of Ignatii Krachkovski on the nautical literature of the Arabs and Ottomans in 15<sup>th</sup> and 16<sup>th</sup> century and on the history of Ottoman geographical literature of the 15<sup>th</sup>-19<sup>th</sup>

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<sup>1</sup> TAESCHNER, Franz. "Die geographische Literatur der Osmanen." *Zeitschrift der Deutschen Morgenländischen Gesellschaft* N.F. 2 (1923): 31-80.

<sup>2</sup> Here studied in the expanded edition: ADIVAR, A. Adnan. *Osmanlı Türklerinde ilim* (İstanbul: Remzi, <sup>5</sup>1991).

centuries did not find readers in the western Ottomanists circles.<sup>3</sup> Apart from the general and comprehensive book of Adivar, there were other publications specialized in narrower topics, such as the field of Ottoman geography, cartography and hydrography, which is the subject of this thesis. İbrahim Hakkı Konyalı published his *Topkapı Sarayında deri üzerine yapılmış eski haritalar* in 1936.<sup>4</sup> This was the first effort to collect the Ottoman mapmaking production and present it through the items preserved in the richest of Turkish collections, the Topkapı Palace Library. Not only Ottoman-Turkish, but also Islamic and Western maps were included in that study, thus giving a general and preliminary idea of the Ottoman sultans and their entourage's geographical and cartographical interests. This study was also a first indicator of the Ottoman technology of the space and its products. The interest in Ottoman cartography was born during the late 1920's, when the Pīrī Re'īs map of the 1513, that provides an early depiction of America, was discovered and presented to the international scholarly society. Paul Kahle was the main orientalist, who made the map known with a series of publications and lectures in various languages all around the world. The same scholar published as well Pīrī Re'īs's opus magnum *Kitab-ı Bahriye*, the Book on Navigation in 1926.<sup>5</sup>

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<sup>3</sup> КРАЧКОВСКИЙ, Игнатий Юлианович. "Турецкая географическая литература XV-XIX вв." И. Ю. Крачковский, *Избранные сочинения* (Москва: Академия Наук СССР, 1957), 4: 589-656. КРАЧКОВСКИЙ, Игнатий Юлианович. "Морская география в XV-XVI вв. у Арабов и Турок." *Географический Сборник* 3 (1954): 13-44. Reprinted in И. Ю. Крачковский, *Избранные сочинения* (Москва: Академия Наук СССР, 1957), 4: 547-588.

<sup>4</sup> KONYALI, İbrahim Hakkı. *Topkapı Sarayında deri üzerine yapılmış eski haritalar* (İstanbul: Ülkü Basımevi, 1936).

<sup>5</sup> For bibliographical references, see the relevant chapter on Pīrī Re'īs.



This acted on new publications and studies on the Pīrī Re'īs phenomenon and his magisterial scholarship.

Today the list of monographs and articles published on Pīrī Re'īs and his works is very long. Nevertheless, mainly the cartographic part of his Book on Navigation attracted the interest of the scholars and the text itself was rarely seen as a sailing-directions text within the frame of a navigation-technological trend in the Mediterranean world of the 16th century. The vast majority of the scholarship on Pīrī Re'īs was concentrated on strictly Ottoman matters and bibliography, while the well studied nautical texts of the Latin, Italian, Spanish, Greek, Arabic, French and English productions were parsimoniously taken into consideration. This attitude of the Ottomanist's circles has often accepted the accusations by historians of other geographies and periods. The Ottoman world should always be seen as a part of the Mediterranean and European realities. Not only political, but also cultural and scientific developments in that wider geographical space, in terms of genesis, diffusion, and interaction, were not limited within the borders of the states. On the contrary, they were connected in a more expanded net of relations.

This short study is concentrated on the Ottoman production of navigational know how, especially the sailing-directions texts of the 16th century. The period was chosen, because during that time the first texts of this kind appear in the Ottoman world. This was an era enthusiastically named “golden epoch” or “century of the sea” in Ottoman historiography. After the consolidation of the imperial

power during the reign of Mehmed the Conqueror, Süleyman's time, that is the 16th century more or less, was the period, when the Ottoman navy and the ships under Ottoman flag met in terms of shipbuilding, seamanship, power, victories, wealth and growth with a successful development. Moreover, this time was the period, when the "*Ottoman system*" took its final shape, the institutions that sustained it functioned efficiently, and the "*Ottoman identity*" constituted a reality.

The first chapter is a brief introduction to the historical relations of the Turkish principalities of Eastern Asia Minor and the Ottomans till the 16th century with the sea and the art of seamanship. The Aegean Sea was of core importance to the Ottomans due to its geographical position, because it protected the dominion's capital. This enclosed sea should be part of the Ottoman territory in order that the central power was secured. And this is what the Ottoman fleet tried to accomplish since the late 15th century, while the biggest part of the project was completed in the mid-16th century. In the same chapter the relations of the Ottomans with the Western powers, the establishment of Pax Ottomanica in the Eastern Mediterranean and finally, the displacement of the center of interest from the old world of the Mediterranean to the new field of the Atlantic Ocean, after the incorporation of America to the European affairs, are the topics in discussion. This is in order to give the historical frame in connection with maritime matters, and depict the *terrain* and reasons for the Ottoman navigational technology to take place.

The second chapter deals with the development of navigation and navigational technology in the Mediterranean during the late Medieval and early

modern times. This technology is connected to the orientation. Nautical instruments, which were used on board, the two types of navigation and a variety of terminology are discussed.

The common share and the diffusion of skill among the Mediterranean mariners is the topic of the third chapter. Seamen from various religious, ethnic and state provenances met each other on still or stormy water, lived more or less the same life, had the same fate and together with being the intermediaries for a series of exchanges, they shared navigational techniques as well. A result of that osmosis was a common language, the “lingua franca” with words of Italian, Greek, Turkish, Arabic, Spanish and Slavic languages.

The fourth chapter goes into the evolution of the genre of sailing-directions texts in the Mediterranean from the Antiquity to the 16th century. Ancient Greek and Roman, Byzantine, Latin, Italian, Early Modern Greek, Arabic, Spanish, Portuguese, French and English products of this kind are studied.

Finally, the fifth chapter deals with the Ottoman’s reaction towards the production of that specified technological manuals. The research done resulted into three texts within the time limits set. Pīrī Re’īs’s *Kitab-ı Bahriyye*, compiled in 1520-1526, is the first sailing directions written in the Ottoman language. It is a mixed sort of text with other dimension as well, but here the study is focused on its character as a portolan-text. Towards the end of the 16<sup>th</sup> century Ḥācī Muḥammed Re’īs appears to be the author of a pure text of this kind, which gives the distances between two spots all around the coastline of the Mediterranean Sea. A third work

of the same content is a couple of portolan-texts called the *Borgiano Portolans*. They are preserved in a single copy, which may be dated in the late 18<sup>th</sup> century, but its technology is closer to the 16th-century portolans.

This is the general scheme of the thesis, which is a preliminary study of a technology hitherto very little known to the Ottomanists and the historians of navigation. The thesis will attempt to answer to questions, such as how the Ottomans reacted in this specific genre of navigational manuals, did they produce original works, and, did they take part in the diffusion of skill among the Mediterranean maritime powers? Additionally, this study will deal with the problems of authorship, date of composition, the sources and other issues emerging from the analysis of the three texts that consist the main body of the thesis.

## CHAPTER ONE

### AEGEAN LAKE, THE WEST, PAX OTTOMANICA, AND THE DISPLACEMENT OF THE UMBILICUS TERRAE

Since the era of the Turkic emirates of Asia Minor, when the nomadic tribes of Central Asiatic provenance were taking part in rapid cultural evolution, it became a requisite for the new inhabitants of the Mediterranean world to approach the unknown for them element of the sea.<sup>6</sup> The miniature states of the gazis,<sup>7</sup> which based their economy on booty acquired through conquest, occupied already since 13<sup>th</sup> century the significant port of Attaleia (Antalya),<sup>8</sup> while the emirate of Menteşe was practicing piracy in a way to discover new financial resources since the beginning of the same century. The Eastern Roman state was at death's door, since it had made entirely its trade over to Genoese and then to Venetian hands, who managed to become the main middlemen of the commerce of products from

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<sup>6</sup> See CARRETTO, Giacomo E. *Akdeniz'de Türkler*, çev. Durdu Kundakçı – Gülbende Kuray (Ankara: Türk Tarih Kurumu, 1992), 9-11.

<sup>7</sup> WITTEK, Paul. *The Rise of the Ottoman Empire* (London: The Royal Asiatic Society of Great Britain and Ireland, 1938; repr. 1958), page 30 of the Greek translation: Athens 1988. For the war of gazis in the Aegean see PRYOR, John H. *Geography, technology, and war. Studies in the maritime history of the Mediterranean, 649-1571* (Cambridge: Cambridge University Press, 1992), 167 ff.

<sup>8</sup> WITTEK, *op. cit.*, 57. PRYOR, *op. cit.*, 165 ff. See, also, WITTEK, Paul. *Das Fürstentum Mentesche* (Istanbul: Abteilung Istanbul des Deutschen Archäologischen Institutes, 1934).

the East that were imported from Europe during those centuries. At that time, the center of financial power was moved towards the West in order to sustain the blossoming of the Italian cities and to activate, with the support of the colonies in Greece, the gradual decay of Constantinople. The Middle Byzantine dominance over Eastern Mediterranean was already a past.<sup>9</sup> Its shipbuilding installations, though, recrudesced<sup>10</sup> in order to serve the new order.

Over the Aegean shores of the post-Seldjukid<sup>11</sup> Asia Minor the pirate-state of Menteşe in collaboration with the emirate of Aydın created a fleet, which under

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<sup>9</sup> Ahrweiler in her important study on the sea and navy of Byzantium concludes that the Byzantine navy, which was created in order to serve the idea of reconquest of the old Roman lands, was impoverished together with the damping of the idea that generated it (see AHRWEILER, H  l  ne. *Byzance et la mer. La marine de guerre, la politique et les institutions maritimes de Byzance aux VIIe-Xve si  cles* (Paris: Presses Universitaires de France, 1966), 394), since Byzantium remained always a continental power without significant performances in the naval things: "Byzance reste, bon gr   mal gr   et avant tout, un empire continental dont la vraie base fut toujours l' Orient,   tranger aux choses de la mer..."(*op. cit.*, 395).

<sup>10</sup> KAHANE, Henry & Ren  e and Andreas Tietze. *The lingua franca in the Levant. Turkish nautical terms of Italian and Greek origin* (Urbana: University of Illinois Press, 1958; repr. Istanbul: ABC, 1988), 10-13, and ΜΠΕΚΙΑΡΟΓΛΟΥ-ΕΞΑΔΑΚΤΥΛΟΥ, Αικ. *Οθωμανικά ναυπηγεία στον παραδοσιακό ελληνικό χώρο* (Αθήνα: Πολιτιστικό Τεχνολογικό Ίδρυμα ΕΤΒΑ, 1994), 11-12.

<sup>11</sup> The first naval raids of the Turkic tribes against the Byzantines are dated in the era of the Seldjukid Sultanate of Rum. The Seldjuk lord of Nicaea (  znik) Ebulkasim (see ZACHARIADOU, Elizabeth. "Holy war in the Aegean during the fourteenth century." In *Latins and Greeks in the Eastern Mediterranean after 1204*, edited by B. Arbel, B. Hamilton, and D. Jacoby (London: Totowa, 1989), 212, and PRYOR, *op. cit.*, 113) was followed by the emir of   zmir Caha or   aka, who was doing raids in 1081-1106 onto the Asia Minor coasts, the islands of Eastern Aegean and the sea of Marmara (the important port of Abydos). He created a strong fleet with the assistance of a Christian from Smyrne, who was experienced in maritime matters. See ΣΑΒΒΙΔΗΣ, Α.Γ.Κ., "Ο Σελτζούκος εμίρης της Σμύρνης Τζαχάς (  aka) και οι επιδρομές του στα μικρασιατικά παράλια, τα νησιά του ανατολικού Αιγαίου και την Κωνσταντινούπολη, c. 1081-c. 1106." *Χιακά Χρονικά* 14 (1982):9-24 & 17 (1984): 51-66. Nevertheless, Byzantium and the Sultanate of Rum managed to put an end to his activities with his assassination. For   aka see also KURAT, Akdes Nimet. *  aka Bey.   zmir ve civarındaki ilk T  rk Beyi, MS 1081-1096* (Ankara: T  rk K  lt  r  n   Arařtırma Enstit  s  , <sup>3</sup>1966). For the naval activities of the Turkic emirates of Asia Minor see   NALCIK, Halil. "The rise of the Turcoman

the guidance of Gazi Umur Beg<sup>12</sup> was doing raids over the Macedonian and Thracian coasts. The *sea gazis*<sup>13</sup> of Aydın were the forerunners of the Ottoman conquerors in the Greek lands and the trade that their state did with Venice was the usher of the Venetian-Ottoman commercial relations.<sup>14</sup> Additionally, the Ottomans were assisted on the sea by the fleet of the emirate of Karasi, with which they passed to the Greek peninsula,<sup>15</sup> while they founded their first significant dockyard with the conquest of Kallipolis in 1390. Smaller dockyards of them were already active in Prainetos (Karamürsel), Kyzikos (Edincik), and Nicomedia (İznikmid, İzmid). Shortly their number would be increased dramatically in the regions of Propontis (Marmara Sea), the Black Sea and the eastern shores of the Aegean.<sup>16</sup> The conquest of the Greek island and continental territories was evolving rapidly

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maritime principalities in Anatolia, Byzantium and the Crusades.” *Byzantinische Forschungen* 9 (1985): 179-217. ЖУКОВ, К.А. *Эгейские эмираты в XIV-XV вв.* (Москва 1988).

<sup>12</sup> ZACHARIADOU, *op. cit.*, 215 ff. PRYOR, *op. cit.*, 167-171.

<sup>13</sup> WITTEK, *op. cit.*, 58.

<sup>14</sup> ZACHARIADOU, Elizabeth A. *Trade and crusade. Venetian Crete and the emirates of Menteshe and Aydın, 1300-1415* (Venice: Hellenic Institute of Byzantine and Post-byzantine Studies, 1983), 3.

<sup>15</sup> HALAÇOĞLU, Yusuf. *XIV-XVII. yüzyıllarda Osmanlılarda devlet teşkilâtı ve sosyal yapı* (Ankara: Türk Tarih Kurumu, 1991), 52 ff.

<sup>16</sup> ΜΠΕΚΙΑΡΟΓΛΟΥ-ΕΞΑΔΑΚΤΥΛΟΥ, *op. cit.*, 84-86, HALAÇOĞLU, *op. cit.*, 54, BOSTAN, İdris. *Osmanlı bahriye teşkilâtı: XVII. Yüzyılda tersâne-i âmire* (Ankara: Türk Tarih Kurumu, 1992), 15. For the Sultanic dockyard in Galata see MÜLLER-WIENER, Wolfgang. “Zur Geschichte des Tersâne-i Âmire in Istanbul.” In BACQUÉ-GRAMMONT, Jean-Louis et alii (éds). *Türkische Miscellen. Robert Anhegger Festschrift-Armağanı-Mélanges* (Istanbul: Editions Divit Press, 1987), 253-273, and BOSTAN, İdris. “Piri Reis’in Kitab-ı Bahriyye’inde bulunan tersane-i amire planları.” *Sanat Tarihi Araştırmaları Dergisi* 1.2 (1988): 67-68.

finding as sole obstacles the Italian,<sup>17</sup> Catalan and Frankish colonies, predominantly islands and ports that would be often changing lord during the consequent centuries. Since Mehmed the Conqueror, who set out for the incorporation of the Aegean shores and islands into his dominion, till Selim Yavuz and Süleyman the Lawgiver, with the Venetian-Ottoman sea fights and the expansion into the Balkans and Central Europe, the Ottoman state would be expanded<sup>18</sup> over the old territories of the Eastern Roman Empire, in order to activate the imaginable split<sup>19</sup> of the Mediterranean between East and West with constantly opposing interests. Nevertheless, the old capitulations of the Europeans were renewed<sup>20</sup> under the Ottomans with a pressure that would be gradually augmented over the centuries, while the stagnation and reorganization of the East slowly and changelessly would make the state less flexible to adjust itself into the new situations.

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<sup>17</sup> Since the Genoese were held away by Mehmed the Conqueror and Beyazid I to their colonies in the Black Sea, and together with the Venetians away from most of the Aegean, then Süleyman was able to work towards the Ottoman naval supremacy. See IMBER, C.H. "The navy of Süleyman the Magnificent." *Archivum Ottomanicum* 6 (1980): 211. KISSLING, H.J. "İkinci Sultan Bayezid'in deniz politikası üzerine düşünceler (1481-1512)." *Türk Kültürü* 7.84 (1969): 895 ff. For Bayezid's efforts see FISHER, Sydney Nettleton. *The foreign relations of Turkey, 1481-1512* (Urbana: University of Illinois Press, 1948; republished electronically in *Electronic Journal of Oriental Studies* 3.3 (2000): 1-111).

<sup>18</sup> CARRETO, *op. cit.*, 27.

<sup>19</sup> Braudel in his work on the Mediterranean talks for an imaginable border between East and West, where all the significant conflicts took place. This borderline may be defined by the naval battles of Actium (31 BC), Preveza (1538), Naupactos (1571), Malta, Zama and Djerba on the Algerian peninsula.

<sup>20</sup> Venice made contracts with the Ottoman state on April 18<sup>th</sup>, 1454, while France would later on block the collection of money for the crusader activities of the Pope. See FLEET, Kate. *European and Islamic trade in the Early Ottoman State. The merchants of Genoa and Turkey* (Cambridge: Cambridge University Press, 1999).



Since the fall of Constantinople, the fight over the ex-Byzantine Aegean concerned only the Ottomans and the Venetians,<sup>21</sup> while a proportion of the Greek element<sup>22</sup> was divided into the service and support of the two powers of the region bringing together its seamanship acquired through centuries. The Ottomans, by their side, knew that, in order to make themselves present on the *theater* of the Mediterranean, they should possess the enclosed sea, the *lake* of the Aegean,<sup>23</sup> thus in this way they protected their capital from the south. On the contrary, the Venetians, who followed another system, in order to support their economical status needed to control the trade roads with the East, while they maintained an intra-Mediterranean system of colonies. The Ottoman financial system was the territorial expansion through conquest, on which the state resources were based. The Venetians were active though in an early type of capitalistic economy.

Before the Ottomans proceed gradually to the European system and during the classical period of the reign of the Lawgiver, the state covered a wide territory around the Eastern Mediterranean and possessed, with a few exceptions, the heart

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<sup>21</sup> LEWIS, Bernard. *The Muslim discovery of Europe* (New York: Norton, 1982), 226. SOUCEK, Svat. *Piri Reis and Turkish mapmaking after Columbus-The Khalili Portolan Atlas* (London: The Nour Foundation - Azimuth Editions - Oxford University Press, <sup>2</sup>1996), 10-13. See, also, GUILMARTIN, J.F., *Gunpowder and galleys. Changing technology and Mediterranean warfare at sea in the sixteenth century* (Cambridge: Cambridge University Press, 1974).

<sup>22</sup> For the supply of material to the Süleyman's navy by Greeks, see IMBER, *op. cit.*, 231 ff. For Greek craftsmen and experienced mariners in it, see p. 242 ff.

<sup>23</sup> SPHYROERAS, Vasilis, et al. *Maps and map-makers of the Aegean* (Athens: Olkos, 1985), 9.

of the region that is the Aegean.<sup>24</sup> In the beginning, by granting protection to pirates and then with their incorporation the Ottoman state made use of the nautical past of the region and managed to develop a fleet,<sup>25</sup> which was equal to its continental achievements. The Ottoman order and the mechanism of the revenues were functioning, as soon as the conquests went on. Their interception would denote the recall of the power over land and sea. The title of the “Ruler of the Seas and Lands” (Ḥākānū’l-baḥreyn Sulṭānū’l-berreyn)<sup>26</sup> would not follow the Ottoman sultan for long after the sea battle of Naupactos/Lepanto (1571). And not only because the Santa Lega of the Pope and the European kings managed to impose its power at least over the Western and Central Mediterranean, but because Naupactos came to reveal with the losses of both sides that it was one of the last serious intra-Mediterranean conflicts of East-West. The Ottoman naval power was still strong since two important island conquests took place in Cyprus the same year and in Crete a century later.

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<sup>24</sup> In a total of 222 charts in the Pīrī Re’īs *Kitab-ı Bahriyye* copy of Süleymaniye, MS. Ayasofya 2612, 76 depict the Aegean and coasts of the Greek peninsula, 30 the eastern coasts of the Adriatic, 44 the Italian shores, 8 the French and Spanish shores, 35 the Northern African ones, 7 the Eastern Mediterranean coasts, 19 the southern Asia Minor shores and 3 the Marmara Sea.

<sup>25</sup> The fleet of the Ottoman state was never permanent, like in Western Europe, but was organized by every sultan from the beginning. For the fleet of Bayezid see KISSLING, H.J. “Betrachtungen über die Flottenpolitik Sultan Bayezids II, 1481-1512.” *Saeculum* 20 (1969): 35-43. See, also, FISHER, *op. cit.* For Süleyman’s fleet see IMBER, *op. cit.*, and KAHANE-TIETZE, *op. cit.*, 17-20.

<sup>26</sup> ΜΠΕΚΙΑΡΟΓΛΟΥ-ΕΞΑΔΑΚΤΥΛΟΥ, *op. cit.*, 12. The same title was used by the Seldjukid sultan İzzeddin Keykavus since 1215: “Sulṭānū’l-berri ve’l-baḥr.”

It is not without reason that the 16<sup>th</sup> century was named the “century of the sea”<sup>27</sup> in Ottoman historiography. During this period the dominance over the sea was reinforced, a rather *sine qua non* element for a Mediterranean power, and stabilization took place. Consequently Pax Ottomanica was able to be established. The fight in the sea was the reason for the development of nautical science was developed by the Ottomans. On the other hand, apart from the same reason, there was a series of other factors, such as the facilitation of sea trade, and the emergence of the phenomenon of Renaissance with the cultivation of the positive sciences and the faith on their methods, that were important for the evolution of the nautical science first in Italy and then in other Western Mediterranean powers.

The old world of the Mediterranean Sea<sup>28</sup> with the evolvement and amelioration of the navigational manuals reached a high point of precision in the depiction and description of space. After the discovery of new routes to the resources of the Orient, and the *revelation* of new lands and continents, that old world became a witness of the displacement of the center of earth to another greater sea, which was going to become during the following centuries the cradle of interest.<sup>29</sup> The exhausted and overcharged world of the Mediterranean basin quested for its rejuvenation with two ways, that was with social reconstruction of the classes and reorganization of ideas and principles for the Italian people and the

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<sup>27</sup> ADIVAR, A. Adnan. *Osmanlı Türklerinde ilim* (İstanbul: Remzi, 1991), 71.

<sup>28</sup> After 1620 or 1650 it certainly is not the center of the world any more according to Braudel.

<sup>29</sup> For the enlargement of the world see NEBENZAHL, Kenneth. *Maps from the age of discovery. Columbus to Mercator* (London: Times Books, 1990), viii.

central-western lands of Europe, and with colonizing expansion outside of the basin for the non-Mediterranean Portuguese, the Spaniards and later on the Dutch. Already before the gradual *revelation* of America, the theater of the conflicts outside of the Mediterranean core was concentrated in the Indian Ocean,<sup>30</sup> where Portuguese and Ottomans were in search of territorial, economical and religious predominance.

The 16<sup>th</sup> century in terms of the development of navigational manuals in the Mediterranean was a period of intense scientific and practical endeavor. It was the last effort of the Mediterranean peoples to give a written form of their perception of their own space, to conceive and describe it. Soon the naval developments would be far more intense and fruitful in other seas than the Mediterranean. The locals would gradually lose power, which was gained by non-Mediterranean states.

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<sup>30</sup> ÖZBARAN, Salih. *The Ottoman response to European expansion. Studies on Ottoman-Portuguese relations in the Indian Ocean and Ottoman Administration in the Arab Lands during the sixteenth century* (Istanbul: The Isis Press, 1994). ÖZBARAN, Salih. *Yemen'den Basra'ya sınırdeki Osmanlı* (İstanbul: Kitap Yayınevi, 2004). SAFFET, B. "Bir 'Osmanlı filosunun Sumatra seferi." *Tārīḫ-i 'Osmāni Encümeni Mecmū'ası* 1 (1912): 604-614 & 678-683. BACQUÉ-GRAMMONT, J.L., et A. Kroell, *Mamlouks, Ottomans et Portugais en mer Rouge. L'affaire de Djedda de 1517* (Le Caire: IFAO, 1988). ORHONLU, Cengiz. *Osmanlı İmparatorluğu'nun güney siyaseti. Habeş eyaleti* (Ankara: Türk Tarih Kurumu, 1996). For the use of Islamic charts and sailing directions texts in the Indian Ocean, see TIBBETTS, G.R. *Arab navigation in the Indian Ocean before the coming of the Portuguese*, being a translation of *Kitāb al-Fawā'id fī uṣūl al-baḥr wa'l-qawā'id* of Aḥmad b. Mājid al-Najdi (London: The Royal Asiatic Society of Great Britain and Ireland, 1971).

In the *Book on Navigation* we read how the Portuguese reached the Indian Ocean and how they discovered the cape of Good Hope. Pīrī Re'īs adds: "... Anlaruñ iḳdāmu bize 'ār-idi (... their advance was a shame for us)." See Pīrī Re'īs, *Kitāb-ı Bahriyye*, Istanbul, Süleymaniye Ktph., MS. Ayasofya 2612, f. 18b.

Pīrī Re'īs, connected his name with the most precise depiction of the old Mediterranean world, when he composed the most detailed book of the islands and portolan of that sea in the first half of the 16<sup>th</sup> century. He took part in the developments in the Indian Ocean, since he was Admiral of the Ottoman state over there. He was the author of two charts that depict America (dated 1513 and 1528 respectively), thus he took part in the era of discoveries, as well.<sup>31</sup> This should not be considered automatically an achievement of the state,<sup>32</sup> which he served, but mainly his own attainment. The Ottoman state did not share the tactic of colonialism, its economical principles differed, and for this reason it remained a shareholder of the enclosed Mediterranean life. The very few attempts for rule over the Indian Ocean had neither a permanent character, nor stable result. The same situation, gradually, but more slowly would happen to the Serenissima, the Venetian Republic, while Genoa went off a few centuries earlier.<sup>33</sup> The Iberian states and Netherlands, together with Britain, were the new powers to undertake the

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<sup>31</sup> “Şimdi anda her fūnūn ūzre tamām ūğl ēder heb keūtī-bānān, ēy hūmām (If you do care, you should have in mind that those who know the art of navigation sail on these waters [the Atlantic Ocean]),” says Pīrī Re'īs. See Pīrī Re'īs, *Kitāb-ı Bahriyye*, Istanbul, Süleymaniye Ktph., MS. Ayasofya 2612, f. 19a.

<sup>32</sup> GOODRICH, Thomas D. “Osmanlı Amerika araūtırmaları: XVI. Yūzyıla ait *Tarih-i Hind-i Garbī* adlı eserin kaynakları ile ilgili bir araūtırma.” *Belleten* 195 (1985): 671. For the Ottoman version of the New World marvels, see GOODRICH, Thomas. *The Ottoman Turks and the New World. Study of Tarih-i Hind-i Garbi and sixteenth century Ottoman Americana* (Wiesbaden: Harrassowitz, 1990). See, also, HESS, Andrew C. “The evolution of the Ottoman seaborne empire in the age of the Oceanic discoveries, 1453-1525.” *American Historical Review* 75.6-7 (1970): 1892-1919, BRUMMETT, Palmira. *Ottoman seapower and Levantine diplomacy in the age of discovery* (New York: State University of New York Press, 1994), and АЛЕЙНЕР, А.З. & М.А. Коган. “Истина и вымысел о некоторых картах эпохи великих открытий.” *Известия Всесоюзного Географического Общества* 102.6 (1970): 543-549.

<sup>33</sup> The elimination of Genoa since 1381 will mean the reinforcement of Venetian power in Eastern Mediterranean.

tracing and record of the whole world. The new portolans and sailing directions were not limited any more to the description of the Mediterranean and its *umbilicus terrae*, the Aegean Lake, but they perceived as center of the navigational and hydrographical record of the old unknown ocean, which is named Atlantic, and would gradually become the center of new fights. This sea would control the balance of powers. The maritime powers of Netherlands<sup>34</sup> and Britain since the 17<sup>th</sup> century would dominate the new oceans and map them with notable perfection. Venice, the old center of mapmaking and navigational technology would be replaced by Amsterdam and London. For the Ottomans there won't be another Pīrī Re'īs,<sup>35</sup> the introduction of ideas from the developing Europe will be thoroughgoing<sup>36</sup> and will bring maps and nautical know how from the *Theater of the World* (Theatrum Orbis Terrarum) in Ottoman language, therefore being a translation from western languages and product of Dutch skill.<sup>37</sup>

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<sup>34</sup> The Dutch will replace the Portuguese in the Indian Ocean.

<sup>35</sup> GOODRICH, Thomas D. "Osmanlı Amerika arařtırmaları: XVI. Yüzyıla ait *Tarih-i Hind-i Garbî* adlı eserin kaynakları ile ilgili bir arařtırma." *Bellefen* 195 (1985): 672-673.

<sup>36</sup> TAESCHNER, Franz. "Die geographische Literatur der Osmanen." *Zeitschrift der Deutschen Morgenländischen Gesellschaft* N.F. 2 (1923): 73-74.

<sup>37</sup> KOEMAN, Cornelis. "Turkse transkripties van de 17<sup>e</sup> eeuwse Nederlandse atlasen." In *Kartengeschichte und Kartenbearbeitung. Festschrift zum 80. Geburtstag von Wilhelm Bonacker, Geograph und wissenschaftlicher Kartograph in Berlin, am 17. Maerz 1968*, hrsg. von Karl-Heinz Meine (Bad Godesber: Kirschbaum, 1968), 71-76.

## CHAPTER TWO

### NAVIGATION AND NAVIGATIONAL TECHNOLOGY

The enclosed sea of the Mediterranean is a geographical unit with a central position in the world's history. It has been the cob of cultures, civilizations, and states that expanded themselves in space and time around its shores. For all those peoples, whose presence was recorded with historical evidence and remains, the element of the sea was an unexceptionable factor in the formation of their ways of living and affected the evolution of their civilizations.

The Egyptians seems to have been the first recorded mariners of the Mediterranean. Their ships, ports, fishing activities, sea life, campaigns and sea battles were depicted in numerous relieves over stone in their temples and secular buildings. Excavations had brought into light artifacts and products that were transported through the sea from Egypt to the Iberian Peninsula, the Southern shores of France, Italy, all around the coastline of the Balkans, the Aegean shores and islands, Asia Minor and the Eastern Mediterranean shores. From figurines of gods and goddesses to jewels, everyday-life objects, and consumable products, such as food and tissues were exported from the Egyptian ports by ships. The same applied to the Cycladic islands and Minoan Crete civilizations, the Phoenicians,

who added a significant number of novelties and inventions in sailing, the classical Greeks, the Romans,<sup>38</sup> then the Byzantines, the Arabs, the Italian city-states, the Catalans and Spaniards, and the Ottomans.

The continuous and constant crossing of the sea was made easy with the evolution of shipbuilding and navigational techniques.<sup>39</sup> Ships used as a motive power either sails or slaves and free laborers to oar in galleys and other sorts of vessels. Gradually smaller ships, which could develop higher speed, were used for war purposes; nevertheless, they were in risk in a rough open sea. On the other side, larger, but slower, crafts could carry more loads. Their heavy structure could secure the transportation in the open sea. According to D.W. Waters “navigation is the art and science of conducting a ship across the sea between assigned places in a safe and timely manner.”<sup>40</sup> When the navigational technology was not that developed, ships used to sail following the coastline. This made the travel to take more time, however, it was a safe, low risk and more guaranteed way. Thus, the pilots had to follow the shore from a certain distance, so that they were able to see and recognize

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<sup>38</sup> CASSON, Lionel. *The ancient mariners. Seafarers and sea fighters of the Mediterranean in ancient times* (Princeton, NJ: Princeton University Press, 1991).

<sup>39</sup> CELERIER, Pierre. *Histoire de la navigation* (Paris: PUF, 1956). CLERC-RAMPAL, George. *L'Évolution des méthodes et des instruments de navigation* (Paris: Revue Maritime, 1921). DENOIX, Com. L., “Les problèmes des navigateurs au début des grandes découvertes.” In *La Marine et l'Economie Maritime du Nord de l'Europe du Moyen Age au XVIII siècle*, Travaux du Troisième Colloque International d'Histoire Maritime (Paris: SEVPEN, 1960), 131-142. HEWSON, J. B., *A History of the Practice of Navigation* (Glasgow: Brown, Son and Ferguson, 1963). HOUSE, H.D. (ed.), *Five Hundred Years of Nautical Science, 1400-1900, III International Reunion for the History of Nautical Science and Hydrography* (Greenwich: National Maritime Museum, 1981).

<sup>40</sup> WATERS, D.W. *Science and the techniques of navigation in the Renaissance*, Maritime Monographs and Reports 19 (Greenwich: The National Maritime Museum, 1976), 1.



the ports on their way and finally approach their targeted spot. This is called “coastal navigation.”<sup>41</sup> In the case of the Aegean or the Archipelago of the Illyrian coast, it was still easy to sail from an island to another, since the distances were not long, and many times the islands were in visual distance the one from the other.

Astronomy has been a discipline that attracted the human interest since the beginning of the historical period. Important civilizations paid great efforts and resulted in significant discoveries that had to do with the sky and the stars. The art of the orientation on both the land and the sea was developed in connection with the evolution of astronomy. Stars, i.e. the Polestar<sup>42</sup> or constellations that were considered immovable in the sky were used in order to determine a position on the earth face. The mariners used astronomical instruments so that they designate their routes, before the invention of the magnetic compass. This is called “astronomical navigation.”<sup>43</sup> According to the principles of this type of navigation, a geographical position and its route to it was determined according to the angle that had as peak a

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<sup>41</sup> On coastal navigation in the Medieval Islamic world see the interesting article KHALILIEH, Hassan S. “The *ribât* system and its role in coastal navigation.” *Journal of the Economic and Social History of the Orient* 42.2 (1999): 212-225.

<sup>42</sup> WATERS, D.W. *Science and the techniques of navigation in the Renaissance*, Maritime Monographs and Reports 19 (Greenwich: The National Maritime Museum, 1976), 7.

<sup>43</sup> BEAUJOUAN, Guy, et POULLE, Emmanuel. “Les origines de la navigation astronomique aux XIV et XV siècles.” In *Le Navire et l'Economie Maritime du XV au XVIII siècles*, Colloque d'Histoire Maritime (Paris: SEVPEN, 1957), 103-118. CALAHAN, Harold Augustin. *The Sky and the Sailor: a History of Celestial Navigation* (New York: Harper and Brothers, 1952). COTTER, Charles H. *A History of Nautical Astronomy* (London: Hollis & Carter, 1968). MOTA, A. Teixeira da. “L'Art de Naviguer en Méditerranée du XIV au XVII Siècle et la Création de la Navigation Astronomique dans les Océans.” In *Le Navire et l'Economie Maritime du Moyen Âge au XVIII Siècle, Principalement en Méditerranée*, Deuxième Colloque International d'Histoire Maritime (Paris: SEVPEN, 1958), 127-154.

certain star and its two sides about the one on the position of the ship and the other on aimed port.

The third and more common type of navigation is the “plane” or “surface navigation.”<sup>44</sup> This was the one used mainly during the Early Modern Times and for the period from 1200 to the 16<sup>th</sup> century, that is the era this thesis is concentrated on. Additionally, this type is the one that characterizes the genre of the portolan-texts discussed. The sailing directions produced under scientific methods since the 16<sup>th</sup> century were a combination of surface and astronomical data.<sup>45</sup>

The pilot, so that he were successful, should have a series of skills that acquired both a level of technical knowledge and an accumulated experience on the wheel. An amount of geographical and astronomical schooling, together with ability in the use of a number of instruments should be added.<sup>46</sup>

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<sup>44</sup> WATERS, David W., “Plane Sailing or Horizontal Navigation,” *Journal of the Institute of Navigation* 9.4 (1956): 454-461.

<sup>45</sup> CELERIER, Pierre. *Histoire de la navigation* (Paris: PUF, 1956). CÉLÉRIER, Pierre. *Technique de la navigation* (Paris: Presses Universitaires de France, 1951). WILLIAMS, J.E.D. *From sails to satellites. The origin and development of navigational science* (Oxford: Oxford University Press, 1992).

<sup>46</sup> CLERC-RAMPAL, George. *L'Evolution des Methodes et des Instruments de Navigation* (Paris: Revue Maritime, 1921). TAYLOR, Eva G.R., and M. W. Richey. *The Geometrical Seaman: A Book of Early Nautical Instruments* (London: Hollis & Carter, 1962). DESTOMBES, Marcel. “La Diffusion des Instruments Scientifiques du Haut Moyen Âge au XV Siècle,” *Cahiers d'Histoire Mondiale* 10 (1966): 31-51.

Among the instruments used in Early Modern navigation was the astrolabe.<sup>47</sup> The astrolabes were astronomical instruments for finding and interpreting information from the stars, such as their position at a given time or the length of day or night. They generally consisted of a number of plates, one for each latitude in which they might be used, set underneath a rete, which showed the position of selected bright stars. They were also adapted to make simple observations, being fitted with a sighting device and a scale of degrees, from which the angle measured can be read. Astrolabes were capable of showing the positions of stars at different times of day or night, on different dates and for different latitudes. Since the 13th century the astrolabe started spreading throughout Europe from the Iberian Peninsula and Sicily. It has remained one of the most important tools of astronomers and mariners until the end of the 18th century. In its most usual form it consisted of an evenly balanced circle or disk of metal, hung by a ring and provided with a rotating alidade or diametral rule with sights, turning within a circle of degrees for measuring the altitudes of sun or stars. On its face it displayed a circular map of the stars, the rete, often beautifully designed in fretwork cut from a sheet of metal with pointers to show the position of the brighter stars relative to one another and to the zodiacal circle showing the sun's position for every day of the year. Lying below the rete were one or more interchangeable plates engraved with circles of altitude and azimuth. To obtain the time, the user first measured the

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<sup>47</sup> STIMSON, Alan. *The Mariners Astrolabe: a Survey of Known Surviving Astrolabes* (Utrecht: HES, 1988).

altitude of the sun, then having noted the sun's position for the day in the zodiacal circle, rotated the rete until the sun's position coincided with the circle on the plate corresponding to the observed altitude. A line drawn through this point of coincidence and the center of the instrument, given by the edge of the alidade, to a marginal circle of hours showed the time.<sup>48</sup> All the stars' position could then be referenced to the local celestial coordinates engraved on the typan that stays below the rete. Among the accessories often found in the back plates of astrolabes were shadow scales for simple surveying and finding heights or distances, calendar scales showing the sun's position in the zodiac for every day of the year and diagrams to convert equal to unequal hours and vice-versa.

After its invention the compass became a very popular and handy instrument, which was not absent from the pilothouse. In navigating, as well as in any sort of surveying, it was the primary device for direction-finding on the surface of the earth.<sup>49</sup> In their simplest and oldest forms the compasses had a needle that showed the North. In its developed versions it had two or more magnetic needles permanently attached to a card, which moved freely upon a pivot, and was read with reference to a mark on the box representing the ship's head. The card was divided into thirty-two points, called also rhumbs, and the glass-covered box or

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<sup>48</sup> WATERS, David W., "Early Time and Distance Measurement at Sea," *Journal of the Institute of Navigation* 8.2 (1955): 153-173.

<sup>49</sup> NEEDHAM, Joseph. "The Chinese Contribution to the Development of the Mariner's Compass," In *Actas do Congresso Internacional de História dos Descobrimentos*, vol. II (Lisboa: Comissão Executiva das Comemorações do V Centenário da Morte do Infante D. Henrique, 1961): 311-324.

bowl containing it was suspended in gimbals within the binnacle, in order to preserve its horizontal position.

A series of other astronomical and distance instruments that facilitated the orientation aboard consisted of a) the quadrant, which was a hand-held instrument made primarily for telling the time and many of them used the space on the back for extras such as a planisphere or a perpetual calendar. b) The octant, which was an instrument designed to measure the altitude of celestial bodies, i.e., the value of the angle between a target object and the horizon along the meridian. The latitude of the observer, one of the coordinates needed along with the longitude to plot one's location on the earth, could be found, by adding the culmination of the altitude ( $90^\circ$  altitude) at the moment of culmination of a heavenly body (Sun, polar star, etc.) to its declination. c) The sundial was including such types as cannon dials, mechanical equinoctial dials and scaphe dials. Many of the dials have adjustable parts and tables, which allow them to be used at different latitudes. Some are solely for telling the time, while others, called "compendia," contained instruments that allowed the user to carry out surveying, make calculations, or predict the times of high and low tide. There were other instruments, such as astronomical rings, clocks, cross-staffs, dividers, lodestones, nocturnals, sandglass for soundings, sounding lead, sextants, and parallel rulers.

Apart from the aforementioned instruments mariners invented and used extensively hydrographical charts and a series of manual on navigation. The

cartography they produced consisted of the so called “portolan-charts,” the technology of which was based on their own observations and measurements on the spot. This was the reason why those maps gave a better and more accurate depiction of the Mediterranean. Later on the portolan-charts were used as basis for the maps produced in laboratories and ateliers by more professional mapmakers. A hydrographical chart consisted of a design of the coastline and islands on a net of lines coming out from a number of wind roses. These were called “rhumb lines.” A mariner put a compass on the wind rose in order to find the orientation of the ship and then measured the distance between his position and the port he intended to go.

Together with the portolan-charts, pilots used the “portolan-texts,” which were both circulated under one and the same name: *portolano* in Italian. The portolan text could provide in words a description of a route, which could not be depicted on a chart. Other information, such as the depth of the waters, the reefs and sandy places, the distance in miles and the orientation was added. These manuals were called, also, “sailing-directions texts.” A more detailed description of this genre of navigational manuals will be given in Chapter 4.

## CHAPTER THREE

### COMMON SHARE AND DIFFUSION OF SKILL

According to the historical outline of the study by Kahane and Tietze, the first centuries of the Turkish tribes in Asia Minor until 1400 had not previously known the sea.<sup>50</sup> Their contacts with seafaring societies and traders began mainly in the 13<sup>th</sup> century, when on the Aegean and Mediterranean coasts of Asia Minor they came in contact with Christian populations (Greeks and Armenians), as well as with Italian merchants with the acquisition of the ports of Alanya and Antalya in the south, and Sinop in the north. In these ports, together with Ayasoluk and Gelibolu, that followed, they inherited the dockyards and their people that preexisted. There, they were taught the shipbuilding techniques used in the Mediterranean and were acquainted with sea and sailing, while gradually Muslim-Turkish sea-communities emerged. Soon not only dockyards, but also vessels were frequented by a variety of people, who had different ethnic and religious origin. As soon as the Ottoman state became a major power in the Mediterranean matters, it attracted groups and individuals, who wanted prosperity and security. When

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<sup>50</sup> KAHANE, Henry & Renée and Andreas Tietze. *The lingua franca in the Levant. Turkish nautical terms of Italian and Greek origin* (Urbana: University of Illinois Press, 1958; repr. Istanbul: ABC, 1988), 5.

Hayreddin Barbaros bequeathed to the Sultan the territories he controlled in 1520, the state found itself expanded all over a sea world of islands and ports from the Aegean to the Algerian coast of Northern Africa. Then Turkish groups moved to Algeria, came in contact with the local Berber mariners, while the latter started to establish relations with both Ottoman vessels, but also with the Ottoman state. With the incorporation of the Slavic lands in the Balkans, the Illyrian shores of the Adriatic became part of the Ottoman dominion and Slavic sailors joined the “*esnaf*,” which functioned under one flag. The same applied to the Arab lands. Frankish individuals mainly from Italy found a privileged and promising future in the Ottoman navy. Simultaneously, slaves of miscellaneous origin, captives, hostages, converts and travelers met in galleys, war, trade and line ships. They followed the same way of life on board, and were equally subject to storms, shipwrecks, pirate assaults, epidemics, and war attacks. Many adventurous stories of this kind are met in the texts of the period that depict sea life. The *Book on Navigation* by Pīrī Reʿīs, the *Mirror of Countries* and the *Book of the Indian Ocean* by Seydi Ali Reis,<sup>51</sup> the *Deeds* of Hayreddin Barbaros, the captives’ short memoirs are among the Ottoman texts that describe the life of the mariners.

On the chart of 1513 Pīrī Reʿīs has written a long legend, which gives the information on Columbus and the New World from the first hand. He says that Kemal Reis, his uncle, had kept a Spaniard captive, who related to him that he had

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<sup>51</sup> SĪDĪ ‘Ālī ibn Ḥusayn. *Book of the Indian Ocean. Kitāb al-Muḥīṭ*, edited with an introduction by Fuat Sezgin, reproduced from MS Reisülküttap 1643, Revan Köşkü, Istanbul, Series C, Facsimile Editions, Volume 60 (Frankfurt am Main: Institute for the History of Arabic-Islamic Science at the Johann Wolfgang Goethe University, 1997).



traveled to those places with Columbus three times. Pīrī Reʿīs certifies that the place names he put on his own map derive from the Columbus map, most probably through the intermediation of that Spaniard captive.<sup>52</sup>

A list of corsairs, who owned galliots in Algiers in 1581 shows that out of 35, only 10 were Turks, 3 were sons of renegades and the remaining 22 renegades themselves: one Hungarian, two Albanians, one French, three Greeks, six Genoese, two Spaniards, one “judío de nación,” two Venetian, one Corsican, one Calabrian, one Sicilian, and one Neapolitan. The admiral himself was a renegade from Calabria.<sup>53</sup>

And the list of the cases and stories is long. Apart from the common experiences, sailors shared maritime technology, as the case of Kemal Reis has shown. Shipbuilding techniques, instruments, charts and texts were in circulation. In this environment bi- or multilingual people were a common phenomenon. The reason for this was not only that they needed to accomplish the whole process of interregional and interstate trade with security and success, but, the most important, to survive within a much-frequented, multi-ethnic, adventurous and high risky environment, the Mediterranean Sea. Often is the case of captives, who finally managed to get released, thanks to their ability to understand and communicate in a foreign language.

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<sup>52</sup> ΛΟΥΠΗΣ, Δημήτρης. *Ο Πίρι Ρεΐς (1465-1553) χαρτογραφεί το Αιγαίο. Η Οθωμανική χαρτογραφία και η λίμνη του Αιγαίου* (Αθήνα: Τροχαλία, 1999), 54-58.

<sup>53</sup> ΚΑΗΑΝΕ & ΤΙΕΤΖΕ, *op. cit.*, 20.

The result of this osmosis was a common idiolect called “lingua franca.”<sup>54</sup> It was a mixed language used by sailors. It contained words from Italian,<sup>55</sup> Greek,<sup>56</sup> Turkish, Latin, Romance languages,<sup>57</sup> Rumanian, Dalmatian, Slavic, Albanian, Arabic,<sup>58</sup> Berber, even Celtic, Germanic, Iranian, Coptic, and Azeri. That nautical technolect comprised terms that could be arranged in the following semantic groups: meteorology and geography, port and dockyard, navy and warfare, merchant marine and commerce, crafts, hull, masts and yards, sails, rigging, ropes, navigation, mooring, rowing, signals, tools and materials, crew and life aboard, and

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<sup>54</sup> On Lingua Franca in the Antiquity see WANSBROUGH, John. *Lingua Franca in the Mediterranean* (Richmond, Surrey: Curzon Press, 1996).

<sup>55</sup> See, also, CORTELAZZO, Manlio. “I termini ereditati e la componente terrestre nel lessico nautico italiano.” *Bollettino dell’Atlante Linguistico Mediterraneo* 8-9 (1966-1967): 67-77. Reprinted in Manlio Cortelazzo, *Venezia, il Levante e il mare* (Pisa: Pacini Editore, 1989), 469-479. CORTELAZZO, Manlio. “I termini ereditati e la componente terrestre nel lessico nautico italiano.” *La navigazione mediterranea nell’Alto Medioevo* (Spoleto: Centro Italiano di Studi sull’Alto Medioevo, 1978), 2: 759-773. Reprinted in Manlio Cortelazzo, *Venezia, il Levante e il mare* (Pisa: Pacini Editore, 1989), 481-495.

<sup>56</sup> ANTONIADIS-BIBICOU, Hélène. “Vocabulaire maritime et puissance navale en Méditerranée orientale au Moyen-Age d’après quelques textes grecs.” *Méditerranée et Océan indien. Travaux du sixième colloque international d’histoire maritime, Venise, 20-24 septembre 1962*, par le soins de Manlio Cortelazzo (Paris: Jean Touzot, 1970), 317-348. ΚΑΡΑΝΑΣΤΑΣΗΣ, Αναστάσιος. “Η ελληνική επίδρασις επί της ναυτικής ορολογίας της Τουρκίας, των Βαλκανίων, της Ρωσίας επί του Ευξείνου Πόντου και της Αιγύπτου επί της Ερυθράς Θαλάσσης.” *Λεξικογραφικόν Δελτίον* 11 (1966-1969): 135-147. ΚΑΡΑΝΑΣΤΑΣΗΣ, Αναστάσιος. “Η ενετική επίδρασις επί της ελληνικής ναυτικής και αλιευτικής ορολογίας.” *Λεξικογραφικόν Δελτίον* 11 (1966-1969): 67-76.

<sup>57</sup> CORTELAZZO, Manlio. “L’elemento romanzo nei portolani greci.” *Bollettino dell’Atlante Linguistico Mediterraneo* 1 (1959): 215-221. Reprinted in Manlio Cortelazzo, *Venezia, il Levante e il mare* (Pisa: Pacini Editore, 1989), 497-503.

<sup>58</sup> OMAN, Giovanni. “La terminologia marinaresca araba alto-medievale nel Mediterraneo.” *La navigazione mediterranea nell’Alto Medioevo*, 14-20 aprile 1977 (Spoleto: Centro Italiano di Studi sull’Alto Medioevo, 1978), 2: 775-796. PELLEGRINI, Giovan Battista. “Terminologia marinara di origine araba in italiano e nelle lingue europee.” *La navigazione mediterranea nell’Alto Medioevo*, 14-20 aprile 1977 (Spoleto: Centro Italiano di Studi sull’Alto Medioevo, 1978), 2: 797-841.

fishing.<sup>59</sup> This vocabulary managed to get out of the world of the sailors and entered literature, especially poetry, as well as everyday life of common people. Very often Italian terms entered the Ottoman language through the intermediation of Greek.

For instance, the Greek word *λιμὴν* was adopted into Ottoman-Turkish as *liman* or *iliman*;<sup>60</sup> the Italian word *al largo* (or *alarga*, “in the offing”) entered Greek as *αλόργα* and Ottoman as *ālārgā*;<sup>61</sup> the Venetian *bala ramada* (“bar-shot”) entered Greek as *μπαλαρμάς* and Ottoman as *bālyemez*;<sup>62</sup> the Latin *fortuna* (“storm”) entered Greek as *φορτούνα* and Ottoman as *fırṭna*;<sup>63</sup> the Spanish *palanqueta* (“bar-shot”) entered Ottoman as *palānketa*;<sup>64</sup> finally, the Greek *χαρτί* (“paper, sea chart”) entered Ottoman as *ḥariṭa*, *ḥarṭi*.<sup>65</sup> Kahane and Tietze have collected and analyzed in their excellent work some nine hundred “lingua franca” *shared* terms.

The use of multiple terms for a certain object is obvious especially in the text of Pīrī Re’īs, where the term *promontory* is called in turns as *ḵavo* (Latin, Italian) and *burun* (Turkish), *island* as *aḍa* (Turkish) and *cezīre* (Arabic), *castle* as *ḵaṣṭalu* (Latin, Italian), *ḵal’e* (Arabic), and *ḥiṣār* (Arabic). The lingua franca

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<sup>59</sup> KAHANE & TIETZE, *op. cit.*, 639.

<sup>60</sup> KAHANE & TIETZE, *op. cit.*, § 801.

<sup>61</sup> KAHANE & TIETZE, *op. cit.*, § 20.

<sup>62</sup> KAHANE & TIETZE, *op. cit.*, § 56.

<sup>63</sup> KAHANE & TIETZE, *op. cit.*, § 305.

<sup>64</sup> KAHANE & TIETZE, *op. cit.*, § 459.

<sup>65</sup> KAHANE & TIETZE, *op. cit.*, § 875.

affected the way places names were pronounced, too. This is obvious in the Greek sailing directions of the 16<sup>th</sup> century, i. e. the city and port of *Αμμόχωστος* (Ammokhōstos) in Cyprus is spelt *Φαμαγόστα* (Famagusta),<sup>66</sup> or the island of the Aegean *Αστυπάλαια* (Astypalaea) is written *Αστονπαλία* (Astupalia)<sup>67</sup> the way Italians would pronounce it.



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<sup>66</sup> DELATTE, Armand (éd). *Les portulans grecs*, 2 vols (Liège-Paris-Bruxelles: Faculté de Philosophie et Lettres de l'Université de Liège – Librairie E. Droz – Académie Royale de Belgique, 1947-58), 1: 294.

<sup>67</sup> DELATTE, *op. cit.*, 1: 89, 91, 278-279, 293, 301

## CHAPTER FOUR

### SAILING-DIRECTIONS TEXTS

Homer in his epic poem Iliad lines up the numerous ships that every Greek and allied city sent to the campaign of Troy. A few centuries later the oracle of Delphi advises Athens that “the wooden walls will save it” from the Persian attack. It was through the “wooden walls,” meaning the ships, that Athens and the classical Greek cities managed to sustain and expand their culture and civilization.

This is the environment, where the oldest surviving sailing directions appeared. The Greeks called them *περίπλοι* (periploi, sing. *periplus*), which means *circumnavigation*. It was used for the cases of coastal navigation around an island, like Crete or Sicily, or even Africa.<sup>68</sup> Herodotus says that the Phoenicians were ordered by the king of Egypt Nekhos to circumnavigate Africa, while Thucydides mentions a *periplus* of Sicily, which was completed in 8 days. A series of other terms was used as well, such as *παράπλους* (*paraplous*, meaning “sailing by the coast”), *διάπλους* (*diaplous* meaning “sailing across”), *περιήγησις* (*periegesis*

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<sup>68</sup> KRETSCHMER, Konrad. *Die italienischen Portolane des Mittelalters. Ein Beitrag zur Geschichte der Kartographie und Nautik* (Berlin: Institut für Meereskunde und Geographisch Institut an der Universität Berlin, 1909; reprinted Hildesheim: Georg Olms, 1962), 149 ff.

meaning “tour”), *περίοδος* (*periodos* meaning “itinerary”). The *Periplus* of Skylax from Karyanda is the oldest. It is dated in between 338 and 335 BC.<sup>69</sup> It begins like this:

“Europe 1. I shall begin from the Pillars of Hercules in Europe and continue to the Pillars of Hercules in Libya, and as far as the land of the great Ethiopians. The Pillars of Hercules are opposite each other, and are distant from each other by one day’s sail. And thereby lie two islands by name Gadeira (Gades). Of these the one has a city, which is distant one day’s sail from the Pillars of Hercules. Beyond the Pillars of Hercules that are in Europe are many trading-places of the Carthaginians, and mud and ties and open seas.”<sup>70</sup>

Other Ancient Greek portolan-text are the *Periplus* of the Euxeinus Pontus (Black Sea) by Arrian, the *Periplus* by Menippos and another anonymous *Periplus* of the Euxeinus Pontus.

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<sup>69</sup> NORDENSKIÖLD, A.E. *Periplus. An essay on the early history of charts and sailing-directions*, translated from the Swedish original by Francis A. Bather (Stockholm: [P.A. Norstedt & Söner], 1897; reprinted New York: Burt Franklin, 1964), 5 ff. KRETSCHMER, *op. cit.*, 152-156.

<sup>70</sup> NORDENSKIÖLD, *op. cit.*, 6.

The *Periplus* of Hanno describes the travel of the Carthaginian king Hanno into the Ocean.<sup>71</sup> It is preserved in a Greek version, dating perhaps to the third century B.C. The Greek text is no doubt less complete than the Punic original, but certain philological oddities can be found in it, which indicate that it is an actual translation of a Punic text. It runs as follows:

“Record of the voyage of King Hanno of Carthage round the lands of Libya which lie beyond the Pillars of Hercules. It has been engraved on tablets hung up in the Temple of Chronos.

The Carthaginians decided that Hanno should go past the Pillars and found Carthaginian cities. He set sail with sixty pentekontas carrying thirty thousand men and women with provisions and other necessities. After passing the Pillars of Hercules and sailing for two days beyond them we founded the first city, which was named Thymiaterion. Around it was a large plain. Next we went on in a westerly direction and arrived at the Libyan promontory of Soloeis, which is covered with trees; having set up a shrine to Poseidon, we set sail again towards the rising sun for half a day, after which we arrived at a lagoon close to the sea covered with many tall reeds. Elephants and large numbers of other animals were feeding on them.

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<sup>71</sup> RAMIN, Jacques. *Le Périphe d'Hannon. The Periplus of Hanno*, B.A.R. Supplementary Series 3, 1976 (Oxford: British Archaeological Reports, 1976).

Leaving this lagoon and sailing for another day, we founded the coastal cities named Carian Wall, Gytte, Acra, Melitta and Arambys.”

A periplus of the Roman period entitled *Ora maritima* was said to have been composed by Rufus Festus Avienus, while at the same period the Greek text of the *Periplus Maris Erythraei* appeared in between A.D. 40-70. It was compiled by an Greek of Egypt.<sup>72</sup> From the Byzantine era there is text called *Σταδιασμός ήτοι περίπλους της μεγάλης θαλάσσης* (Stadiasmos or Periplus of the great sea), which deals with the shores and islands of the Mediterranean and Black Seas. Its editor, C. Müller, came to the conclusion that the work was compiled from various older sources during the 4<sup>th</sup> or 5<sup>th</sup> century A.D.<sup>73</sup> The following is a part from the chapter of the circumnavigation of Cyprus:

“297. From Acamas, with Cyprus to the left, to Paphos, 300 stadia; the city is situated towards the south; it has a triple harbor accessible with all winds, and a temple of Aphrodite.

298. From Paphos to Numenium – an island with a spring; the crossing short; when you have approached the islet, hug the land on the right – 55 stadia.

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<sup>72</sup> CASSON, Lionel. *The Periplus Maris Erythraei*, text with introduction, translation, and commentary by L. C. (Princeton, NJ: Princeton University Press, 1989).

<sup>73</sup> NORDENSKIÖLD, *op. cit.*, 10-14. KRETSCHMER, *op. cit.*, 159-163.



299. From Numenium to Palaepaphos, 25 stadia.

300. From Palaepaphos to Tretoi – it is a promontory – 50 stadia.”

Another short Byzantine portolan-text, the *Stadiodromikon*, is given at the end of the catalogue of ships and equipment gathered for the imperial expedition to Crete in 949 in the historical work of Constantinos Porphyrogenitos *De Cerimoniis*. It resembles in style the aforementioned text.

But before proceed to the Early Modern Era, when the relations, interpolations and continuation in the genre of portolan-text are more constant, we should deal with the relevant terminology.

As mentioned in Chapter 2, the term *portolano* in Italian denoted both chart and text. The portolan-texts appeared and developed into two types. The first is an analytical text, which provides with sailing directions, while gives the physical description of the coast and ports, the distances in nautical miles, the orientation according to the mariner’s compass, alerts for reefs and shallows, informs about potable water, wood for the ships, hunting animals and the friendliness or hostility of the inhabitants of the shore. The second type is called *traverso*; it is a concise “portolan of the distances” giving only orientation and distance between two positions.

Since the late 15<sup>th</sup> and mainly during the 16<sup>th</sup> century other nautical manuals appeared first in handwritten, very soon in printed form. The genre of the *Book of*

*the Islands* or *Isolarium* in Latin and *Isolario* in Italian<sup>74</sup> was introduced by Cristoforo Buondelmonti in 1420-1430. It was an antiquarian sight-seeing on the islands of the Aegean. Its title was *Liber Insularum Archipelagi*.<sup>75</sup> The texts that dealt with each island gave information on events connected with the island taken from the Greek mythology and the classical history. Then, followed a geographical description of the site that included information, which could be considered as an early type of sailing directions, but it seems that this was not among the intentions of the author. Buondelmonti designed charts of the islands in order to visualize the text. His work became very famous and resulted in a series of copies and adaptation, the most important of which was the [*Isolario*] by Bartolomeo dalli Sonetti, which was printed in Venice, ca 1485.<sup>76</sup> This book made the texts more of a portolan-text and the maps more “hydrographical.” Bordone’s *Isolario* appeared printed in 1528 bringing the genre closer to a classical geographical text of the islands of the world, in his case.<sup>77</sup> Piri Re’is’s *Book on Navigation* was based a lot on dalli Sonetti’s *Isolario*.

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<sup>74</sup> ΤΟΛΙΑΣ, Γιώργος. *Τα νησολόγια. Η μοναξία και η συντροφιά των νησιών* (Αθήνα: Ολκός, 2002).

<sup>75</sup> *Christophori Bondelmontii Florentini Librum Insularum Archipelagi*, edited by G.R.L. de Sinner (Lipsiae et Berolini: G. Reimer, 1824). BUONDELMONTI, Cristoforo. *Descriptio Insule Crete et Liber Insularum, cap. XI: Creta*, édition critique par Marie-Anne van Spitael (Ηράκλειον Κρήτης: Σύλλογος Πολιτιστικής Αναπτύξεως Ηρακλείου, 1981).

<sup>76</sup> DALLI SONETTI, Bartolommeo. *Isolario, Venice 1485*, with an introduction by Frederick R. Goff (Amsterdam: Theatrum Orbis Terrarum, 1972).

<sup>77</sup> BORDONE, Benedetto. *Libro ... de tutte l'isole del mondo, Venice 1528*, with an introduction by R. A. Skelton (Amsterdam: Theatrum Orbis Terrarum, 1966).

Another sort of navigational manuals was the *Arte del navigare*, a handbook with various technical information that a sailor would need on board. It described the function of the ship, the way to find the orientation, the use of the nautical instruments, how to calculate the distances and time, and gave general geographical data, etc.<sup>78</sup>

The first sailing-directions text connected to the “early modern era technology” was the anonymous *Liber de existencia riveriarum et forma maris nostri Mediterranei*, which was compiled in Pisa in around the year 1200.<sup>79</sup> It is written in Latin. It gives the allusion of the simultaneous use of a portolan-chart, although such an item did not survive.

Here is a part of the text that describes the southern shores of Asia Minor:

“12. A Stanimura ad castrum Lombardorum tendit riueria inter occasum et circium. Inde ad Candellorum ciuitatem in circium. Inde ad Sathaliam ciuitatem in occasu sunt .clxxxx. ml. A Sathalia uero ad caput situm sub montem qui dicitur Clarum in africo, ante cuius

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<sup>78</sup> ZAMORANO, Rodrigo. *Compendio de la arte de navegar* (En Sevilla: por Alonso de la Barrera, 1581; reprinted Valencia: Librerías "París-Valencia", D.L. 1995). CRESCENTIO, Bartolomeo. *Nautica Mediterranea* (In Roma: appresso Bartolomeo Bonfadino, 1602).

<sup>79</sup> GAUTIER DALCHÉ, Patrick. *Carte marine et portulan au XIIIe siècle. Le Liber de Existencia Riveriarum et Forma Maris Nostri Mediterranei, Pise, circa 1200* (Rome: École Francaise de Rome, 1995).

caput a facie australi non longe in mari sunt insule Yscilidones ml. lx.

Infra que hec didicimus.

A Stanimura ad Anthiocetham ciuitatem ml. .l.

Ad castrum Lombardorum .xv.

Ad ciuitatem que dicitur Candelorum ante se a facie orientali habentem portum ml. .xl.

Inde ad quoddam flumen .xl., cui de prope ab oriente iacet insula.

A flumine ad flumen Satalie et ipsam ciuitatem Satalie ml. .xl., habentem insulam ante et scopulos portum ei facientes.

A Sathalia uero cui iacet in<ter> septemtrionem et circium infra terram ciuita{ti}s Yconium, quam Actus apostolorum meminit, per ml. .cl., usque ad portum Ianuensem computantur ml. .xxx.”<sup>80</sup>

Other texts appeared in Latin and Italian in the following two centuries. The *Compasso de navegare* was published by B. R. Motzo,<sup>81</sup> while Terrosu Asole published another portolan of the 14<sup>th</sup> century, which was incomplete work of the then late Motzo.<sup>82</sup> A series of other Italian sailing directions, such as the portolans

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<sup>80</sup> GAUTIER DALCHÉ, *op. cit.*, 132.

<sup>81</sup> MOTZO, Bacchisio R. (ed). *Il compasso da navigare, opera italiana della metà del secolo XIII* (Cagliari: Facoltà di Lettere e Filosofia de la Università di Cagliari, 1947).

<sup>82</sup> TERROSU ASOLE, Angela. *Il portolano di Grazia Pauli. Opera italiana del secolo XIV trascritta a cura di Bacchisio R. Motzo* (Cagliari: Consiglio Nazionale delle Ricerche, Istituto sui Rapporti Italo-Iberici, 1987).

by Marino Sanudo, Pietro de Versi, the anonymous of Parma-Magliabecchi, by Gratiopus-Benincasa and Rizo, was published by Konrad Kretschmer in his monumental work on the Italian portolans.<sup>83</sup>

The following passage is the description of the southern coast of Spain from the Parma-Magliabecchi portolan:

“40. Dal monte a stoppona 20 miglia quarta di greco ver tramontana.

Da stoppona a marbella 13 miglia per grecho.

Da marbella alla finochiarola 20 miglia per leuante.

Da finochiarola alle molina di malicha 15 miglia per greco e tocha della tramontana.

Dalle molina a malicha 10 miglia per tramontana e tocha del grecho.

quarti da una secha che (sopra alla fiumara, non tachostare troppo a

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<sup>83</sup> KRETSCHMER, Konrad. *Die italienischen Portolane des Mittelalters. Ein Beitrag zur Geschichte der Kartographie und Nautik* (Berlin: Institut für Meereskunde und Geographisch Institut an der Universität Berlin, 1909; reprinted Hildesheim: Georg Olms, 1962). Other Italian prints of that period are *Opera Nova chiamata portolano laqual narra tutte le terre: & porti de leuante cominciando a Venetia andando per tutta la Schiauonia fin a Corfu con tutta la Grecia la Morea & Napoli de Romania con tutto Larchipelago: Constantinopoli Candia Rodi Cipro & tutto il Leuante & tutte le isole: terre citta e castelli & porti & quanti miglia da una terra a laltra & da una isola a laltra: & tutte starie porti valle e colphi: scagni: fondi: e sechi dintorno. Novamente stampato* (Vineggia: Domenego Zio & Fratelli Veneti, s. d. [ca.1518]). *Nuovo Portolano non piv stampato molto particolare de'l Levante a de'l Ponente* (Vineggia: Pavlo Gerardo, 1544). COPPO, Pietro. *Portolano* (In Venetia: per Augustino di Bindoni, 1528; reprinted Trieste: Lindt 1985). *Portolano Opera Nova qual narra tutte le Isole, Terre, Citta, Castelli, Porti, Starie, valli, colphi, scagni, fondi, di Leuante, cominciando a Venetia, andando per la Schiauonia fino a Corfu, la Grecia la Morea, Arcipelago, Costantinopoli, Candia, Rodi, Cipro con tutto il Leuante quante miglia, e da vna isola a l'altra, e da vna terra a l'altra, cosa molto vtile* (In Venetia: per Mathio Pagan, 1558). CRESCENTIO, Bartolomeo. *Portolano della maggior parte de'luoghi da stantiar navi, et galee in tutto il Mare mediterraneo, con le sue traversie, & luoghi pericolosi* (In Roma: appresso Bartolomeo Bonfadino, 1602).

terra). Malicha a buon surgitoio per contra alla terra al canto da leuante in fondo di 6 passi e fatti forte per mezodi e scilocho.

La conoscenza di malicha e vna montagna alta e tonda da mezodi chessi chiama le moline e da leuante vna montagna forchata con due diamante su, va per mezzo e vederai la terra.”<sup>84</sup>

The Arabic portolan-texts<sup>85</sup> followed the astronomical navigation type, therefore they had little interaction with the text in discuss here.<sup>86</sup> The surviving texts deal with the open sea of the Indian Ocean, where, due to the long distances, plane navigation could not be applicable and the use of the stars for orientation was the only alternative. Ibn Madjid (active in the second half of 15<sup>th</sup> century)<sup>87</sup> and al Mahri (active first half of the 16<sup>th</sup> century) compiled sailing directions that dealt with the Arabic seas and the Indian Ocean.<sup>88</sup> They neither describe the

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<sup>84</sup> KRETSCHMER, *op. cit.*, 281.

<sup>85</sup> See КРАЧКОВСКИЙ, Игнатий Юлианович. “Морская география в XV-XVI вв. у Арабов и Турок.” *Географический Сборник* 3 (1954): 13-44. Reprinted in И. Ю. Крачковский, *Избранные сочинения* (Москва: Академия Наук СССР, 1957), 4: 547-588.

<sup>86</sup> HOURANI, Georg Fadi. *Arab Seafaring in the Indian Ocean in Ancient and Early Medieval Times* (Princeton: Princeton University Press, 1922).

<sup>87</sup> BARRADAS, Lerenó. *O Sul de Moçambique no Roteiro de Sofala do Piloto Ahmad Ibn Madjid* (Coimbra: AECA, 1967).

<sup>88</sup> ALBUQUERQUE, Luís de. “Quelques Commentaires sur la Navigation Orientale à l'Époque de Vasco da Gama,” *Arquivos do Centro Cultural Português* 4 (1972): 490-500. MORAIS, J. Custódio de. “Determinação das Coordenadas Geográficas no Oceano Índico pelos Pilotos Portugueses e Árabes no Princípio do Século XVI,” In *Actas do Congresso Internacional de História dos Descobrimentos*, vol. II (Lisboa: Comissão Executiva das Comemorações do V Centenário da Morte do Infante D. Henrique, 1961): 475-522.

Mediterranean, nor mention the use of portolan-charts.<sup>89</sup> They called their directions *masāfāt* or *ḵunbāṣ* (from *compasso*).<sup>90</sup> Portuguese authors, like João de Barros, describe the Arabs' navigational technique and their use of charts.<sup>91</sup>

The Catalans were very productive in portolan-charts since the 14<sup>th</sup> century,<sup>92</sup> while Spaniards produced a series of manuals that met numerous publications and translations into other European languages.<sup>93</sup> They dealt with nautical astronomy and navigational treatises,<sup>94</sup> produced a significant *isolario* by

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<sup>89</sup> MOTA, A. Teixeira da. *Méthodes de Navigation et Cartographie Nautique dans l'Océan Indien avant le XV Siècle* (Lisboa: JIU, 1963).

<sup>90</sup> FERRAND, Gabriel. *Instructions nautiques et routiers arabes et portugais des XV et XVI siècles*, 2 vol. (Paris: Bibliothèque des Géographes Arabes, 1923-1925). FERRAND, Gabriel. *Introduction à l'astronomie nautique arabe* (Paris: Bibliothèque des Géographes Arabes, 1928). CHUMOVSKI, T. "Uma Enciclopédia Marítima Árabe do Séc. XV." In *Actas do Congresso Internacional de História dos Descobrimentos*, vol. III, (Lisboa: Comissão Executiva das Comemorações do V Centenário da Morte do Infante D. Henrique, 1961), 43-56.

<sup>91</sup> FERRAND, Gabriel. "Le pilote arabe de Vasco da Gama et les instructions nautiques des arabes au XV siècle," *Annales de Géographie* 31 (1922): 289-307.

<sup>92</sup> REPARAZ, Gonzalo de. *Catalunya a les Mars. Navegants, Mercaders i Cartografs Catalans de l'Edat Mitjana i del Renaixement. Contribució a l'Estudio de la Historia del Comerç i de la Navegació de la Mediterrània* (Barcelona: Editorial Mentora, 1930).

<sup>93</sup> GARCIA FRANCO, Salvador. *Historia del Arte y Ciencia de Navegar. Desenvolvemento Històrico de "Los Cuatro Terminos" de la Navegación* (Madrid: Instituto Histórico de Marina, 1947). LOPEZ-PIÑERO, José María. *El Arte de Navegar en la España del Renacimiento* (Barcelona: Labor, 1985). GARCÍA DE PALACIO, Diego. *Instrucción náutica para navegar*, prólogo y glosario de voces contenidas en la instrucción náutica por Julio F. Guillén (México: Pedro Ocharte, 1587; reprinted Madrid: Cultura Hispánica, 1944). *Vocabulario marítimo y explicación de los vocablos que usa la gente de mar en su ejercicio del arte de marear*, nuevamente corregido y añadido en esta segunda impresión por mandado de los Cavalleros Mayordomo y Diputados de la Universidad de Mareantes de esta ciudad (Sevilla: Imprenta Castellana de los Herederos de Thommas López de Haro, 1722; reprinted Valencia: Librerías "París-Valencia", D.L. 1992).

<sup>94</sup> LAMB, U. *A navigator's universe. The «Libro de Cosmographía» of 1538 by Pedro de Medina*, translated and with an introduction by U. Lamb (Chicago: University of Chicago Press, 1972). MEDINA, Pedro de. *Regimiento de navegación: contiene las cosas que los pilotos han de saber para bien nauegar, y los remedios y auisos que han de tener para los peligros que*

Alonso de Santa Cruz,<sup>95</sup> and sailing directions mainly on non-Mediterranean geographies.

In 1508 the king of Spain established the so-called *Casa de la Contratación* (or *Casa para la Contratación y Negociación de las Indias*)<sup>96</sup> in Seville, a public service that dealt with discovery missions, colonies and the trade with them. The hydrographic workshop installed in the *Casa* was enveloped in absolute mystery, while any possible leak of charting and navigational material towards foreign powers was prevented at all costs. The chart as a secret (*sigilo*)<sup>97</sup> followed all ships to their journeys. Spaniards named it *padrón real*. On its turn, the kingdom of Portugal established an analogous service, *Casa da India*<sup>98</sup> in Lisbon. Charts that were produced there, were named *padrão real*. One of the reasons of the few

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*nauegando les pueden suceder* (Sevilla: En las casas de Simon Carpintero, 1563; reprinted Valencia: Librerías París-Valencia, D.L. 1993).

<sup>95</sup> CUESTA, Mariano. *Alonso de Santa Cruz y su obra cosmográfica*, 2 vols (Madrid: Consejo Superior de Investigaciones Científicas, 1983-4).

<sup>96</sup> PULIDO RUBIO, José. *El Piloto Mayor de la Casa de la Contratación de Sevilla: pilotos mayores, catedráticos de Cosmografía y cosmógrafos* (Sevilla: Escuela de Estudios Hispanoamericanos, 1950); LATORRE, Germán. *Diego Ribero, Cosmógrafo e Cartógrafo de la Casa de la Contratación de Sevilla* (Sevilla: [Tip. Zarzuela], 1919), and DESTOMBES, Marcel. "Un astrolabe nautique de la Casa de Contratacion (Seville 1563)." *Revue d'Histoire des Sciences* 22 (1969): 33-64.

<sup>97</sup> For maps treated as state secrets in Portugal see ALBUQUERQUE, Luís de. "Ainda o 'Segredo de Estado'." In *Dúvidas e Certezas na História dos Descobrimentos Portugueses*, vol. I (Lisboa: Vega, 1990), 57-66; Jaime Cortesão, *A Política de Sigilo nos Descobrimentos nos Tempos do Infante D. Henrique e de D. João II* (Lisboa: CCVCMIDH, 1960), and LEITE, Duarte. "O Sigilo." In *História dos Descobrimentos. Coleção de Esparsos*, ed. V. Magalhães Godinho, vol. I (Lisboa: Cosmos, 1959), 411-449.

<sup>98</sup> ALBUQUERQUE, Luís de. *Um exemplo de «cartas de serviços» da Índia* (Coimbra: Centro de Estudos de Cartografia Antiga, 1979); ALBUQUERQUE, Luís de, and José Pereira da Costa. "Cartas de «Serviços» da Índia: 1500-1550." *Mare Liberum* 1 (1990): 309-96.



remaining samples of early nautical charting from Spain and Portugal is the secrecy and the severe protection they were enveloped in.<sup>99</sup>

Portuguese navigational literature<sup>100</sup> displayed a diversity of texts such as the *guias náuticos* (nautical guides and astronomical regiments), the *livros de marinaria* (books of seamanship), the *roteiros* (rutters) and the *artes de navegar* (arts of navigation).<sup>101</sup> The greater part of the Spanish and Portuguese manuals quite reasonably dealt with the Atlantic Ocean, the New World, the route to India and the East Asian seas.

The Greek mariners were in close contact with the Italian naval matters, especially Venice. A series of Greeks are met in the service of the Venetian state and navy. Therefore, they were affected by the Venetian know how and produced charts mostly written in Italian, as well as sailing directions, a considerable part of which were translations from Italian originals as their language clearly displays.

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<sup>99</sup> MOTA, A. Teixeira. *A Arte de Navegar de Portugueses e Espanhóis na Época dos Descobrimentos* (Lisboa: Anais do Clube Militar Naval, 1944).

<sup>100</sup> ALBUQUERQUE, Luís de. *A Náutica e a Ciência em Portugal. Notas sobre as Navegações* (Lisboa: Gradiva, 1989). BARBOSA, António. "Arte de Navegar dos Portugueses na Época dos Descobrimentos," in BAIÃO, A. et al. (ed.), *História da Expansão Portuguesa no Mundo*, Vol.I (Lisboa: Ática, 1937), 231-268. COSTA, A. Fontoura. *A Ciência Náutica dos Portugueses na Época dos Descobrimentos* (Lisboa: CCVCMIDH, 1958). COSTA, A. Fontoura da. "L'Art Nautique des Découvertes," *Revue d'Histoire Moderne* 14 (1939): 392-416. VITERBO, Francisco Marques de Sousa. *Trabalhos Náuticos dos Portugueses nos Séculos XVI e XVII*, 2 vol. (Lisboa: Academia das Ciências de Lisboa, 1898-1900). WATERS, David W. "Portuguese Nautical Science and the Origins of the Scientific Revolution," *Boletim da Academia Internacional de Cultura Portuguesa* 2 (1966): 165-191.

<sup>101</sup> ALBUQUERQUE, Luís de. "O "Corpo" Roteirístico Português," In *Dúvidas e Certezas na História dos Descobrimentos Portugueses*, vol. II (Lisboa: Vega, 1991), 75-92. COSTA, A. Fontoura da (ed.), *Este Livro he de Rotear. Bibliografia dos Roteiros Portugueses até ao ano de 1700* (Lisboa: Arquivo Histórico da Marinha, 1933). COSTA, A. Fontoura da (ed.), *Roteiro da Navegação e Carreira da Índia Tirado do que Escreveu Vicente Rodrigues e Diogo Afonso, Agora Novamente Acrescentado por Gaspar Ferreira Reimão*, 2 ed. (Lisboa: AGC, 1940).

Seven manuscripts of Greek portolan-texts from the 16th century are known. The older copy is dated 1534 and belongs to the Library of the Greek Parliament in Athens (MS 108). There is, also, a printed portolan published by Demetrius Tagias in Venice in 1573.<sup>102</sup> In his introductory text Tagias reveals that a manuscript portolan came in his hand in April 1559. His *Portolano* was reprinted in Venice in 1618, 1641, 1729, 1780 and ca. 1800. Thus, there are in sum seven manuscripts and six editions of the printed Greek portolan that cover a period of 266 years from 1534 to 1800.<sup>103</sup> This demonstrates a constant use of those portolans by Greek-speaking mariners until early 19<sup>th</sup> century, when the French and English Navy printed the most up-to-date and accurate sailing directions followed by charts, orographic schedules, soundings and measure details. These French and English handbooks met a great success and were translated into other languages, as well as Greek.

The Ottoman portolan texts are subject of Chapter Five.

The French<sup>104</sup> and English<sup>105</sup> pilots appeared later after the mid-16<sup>th</sup> century.

Again they dealt with the Mediterranean, but, also, with their states near seas, such

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<sup>102</sup> DELATTE, Armand (ed.), *Les Portulans Grecs* (Liège: Bibliothèque de la Faculté de Philosophie et Lettres de l'Université de Liège, 1947), and *Compléments* (Bruxelles: Palais des Académies, 1958). ΤΣΕΛΙΚΑΣ, Αγαμέμνων, et alii (εκδ). *Δύο χειρόγραφοι ελληνικοί πορτολάνοι. Οι κώδικες της Βιβλιοθήκης της Βουλής και της Δημόσιας Βιβλιοθήκης Ζαγοράς* (Αθήνα: Μορφωτικό Ίδρυμα της Εθνικής Τραπέζης, 2003).

<sup>103</sup> MAKRYMIKHALOS, St. I. "Ελληνικοί Πορτολάνοι του 16<sup>ου</sup>, 17<sup>ου</sup> και 18<sup>ου</sup> αιώνας." *Ερανιστής* ["Greek Portolan texts of the 16<sup>th</sup>, 17<sup>th</sup> and 18<sup>th</sup> century." In *Eranistes*] 1 (1963): 128-55 & 211-21.

<sup>104</sup> WATERS, D. W. *The rutters of the sea. The sailing directions of Pierre Garcie. A study of the first English and french printed sailing directions with facsimile reproductions* (New Haven and London: Yale University Press, 1967). MICHELOT, Henry. *Portulan de la mer*

as the Atlantic, the North Sea, the Baltic, etc. The English edition of the so-called *The English Pilot*<sup>106</sup> gradually expressed the peak of maritime technology and know how, met several publications and served as basis for peripheral naval states, such as Greece and the late Ottoman Empire, in order to produce modern directions in their own languages through direct translations or adaptations and compilations.



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*Méditerranée, ou Guide des Pilotes Côtiers, par H.M., ancien Pilote Hauturier sur les Galères. Nouvelle édition corrigée et augmentée de la description des côtes du Levant et des Isles de l'Archipel par un autre navigateur* (Marseille: Jean Mossy, 1805).

<sup>105</sup> ADAMS, Thomas R., and David W. Waters. *English Maritime books printed before 1801, relating to ships, their construction and their operation at sea* (Providence, Rhode Island & Greenwich: The John Carter Brown Library & The National Maritime Museum, 1995). BOURNE, William. *A Regiment for the sea and other writings on navigation by W. Bourne of Gravesend, a gunner (c. 1535-1582)*, edited by E.G.R. Taylor (Cambridge: Cambridge University Press, 1963).

<sup>106</sup> *The English Pilot. Part III. Describing the Sea-Coasts, Capes, Head-Lands, Bays, Roads, Harbours, Rivers and Ports; together with the Soundings, Sands, Rocks and Dangers in the whole Mediterranean Sea...* (London: J. Mount and T. Page, 1771). STEWARDS, John. *General Directions for the Navigation of the Archipelago, with remarks on several ports and anchorages in that sea, together with a few correct latitudes, and magnetic bearings, of various places therein, by J.S. Esq., Captain of His Majesty's Ship Seahorse* (s.l. [London?]: s.n., 1826).

## CHAPTER FIVE

### OTTOMAN SAILING-DIRECTIONS TEXTS

While the earliest known sailing-directions text connected to the “early modern times technology” is a Latin portolan of the Mediterranean, which was compiled in Pisa in around the year 1200,<sup>107</sup> the Ottoman world did not seem to have reacted towards this genre of maritime technology during the first two centuries of its history. Although the first Ottoman Begs and the subsequent Sultans, till the consolidation of the Empire under Mehmed the Conqueror, made extensive use of naval expeditions, especially the last mentioned Sultan, the navigational technology adopted by them does not seem to have been of any especially elaborated and sophisticated type. The earliest orientational instruments that are to be found derive from the late period of the Conqueror’s reign. I would like to give here a short presentation of the pre-Pīrī Re’īs period and description of the navigational items, as well as the item that are connected or based on the navigational skill.

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<sup>107</sup> See GAUTIER DALCHÉ, Patrick. *Carte marine et portulan au XIIe siècle. Le Liber de Existencia Riveriarum et Forma Maris Nostri Mediterranei, Pise, circa 1200* (Rome: École Française de Rome, 1995).

Three so-called *Maghrebian portolan-charts* are today preserved in Turkish state collections and all three must have belonged to the Topkapi Palace Treasury, which they possibly entered in during the reign of Süleyman the Lawgiver. They all depict the Mediterranean Sea and were made in the style of the hydrographical charts to be used on board. Nevertheless, they must be from the copies that were prepared for presentation, as precious gifts to kings or nobles or wealthy erudites and men of letters. These charts do not have any indication like holes by pines, worn edges or seawater spots. They were done on buckskin, designed with skillfulness, colored with splendid and precious colors, while they were also highly decorated.<sup>108</sup>

The oldest of these charts dates 816 (1413-1414) and bears the name of İbrāhīm Kātībī from Tunis. It is held in Istanbul in Topkapi Palace Library (H. 1823). It depicts the Mediterranean Sea as a classical chart of its kind, the “normal portolano,” as Nordenskiöld named it.<sup>109</sup> The place names and all short texts are written in Arabic.

İbrāhīm al-Mursī, that is from Murcia in Southern Iberian Peninsula, signs a nautical chart of the Mediterranean Sea, which is dated 865 (1461). According to a

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<sup>108</sup> See Svat Soucek, “Islamic Charting in the Mediterranean,” In *The History of Cartography*, vol. 2, book 1. *Cartography in the Traditional Islamic and South Asian Societies*, edited by J.B. Harley and David Woodward (Chicago & London: the University of Chicago Press, 1992), 263-265. Игнатий Ю. Крачковский, “Морская география в веках XV-XVI у Арабов и Турок.” [Maritime Geography by Arabs and Turks in 15<sup>th</sup>-16<sup>th</sup> century] *Географический Сборник (Geographicheskii Sbornik)* 3 (1954): 13-44.

<sup>109</sup> NORDENSKIÖLD, A.E. *Periplus. An essay on the early history of charts and sailing-directions*, translated from the Swedish original by Francis A. Bather (Stockholm: [P.A. Norstedt & Söner], 1897; reprinted New York: Burt Franklin, 1964), 45.

short note he was a medical doctor and made the chart in Tripolis of Libya. The chart is preserved in the Istanbul Nautical Museum (Nr. 882). Again on this map only the positions, cities and harbors, that are by the sea are inscribed on it, while inland toponymy rarely takes place.

The third Arabic chart may have been designed after the year 1520 and surely during the early reign of Süleyman the Lawgiver, whose flags appear in many of the Ottoman cities depicted on it. His author is Ḥācc Ābū al-Ḥasan. The unusual feature of this chart is that the continent of Africa is designed as a whole together with its southern shores. The figure is distorted in order that the continent appears intact. This chart is also held in Istanbul in Topkapi Palace Library (H. 1822).

All the aforementioned hydrographical charts are definitely Arabic. They should not be considered as Ottoman products, as a few scholars mistakenly try to do. But they joined the Ottoman Sultan's library possibly during the Lawgiver's reign and became the basis for other Ottoman cartographic products of the 16<sup>th</sup> and 17<sup>th</sup> centuries. Ottoman mariners, copiers, or geographers adapted them in order to design their own charts, i. e. 'Alī Macar Re'īs (fl. 1550-1575).

Apart from the Mediterranean nautical maps we are informed by one of the last Byzantine historians about Mehmed the Conqueror's interests on geography and cartography. Kritovoulos, from the island of Imbros in his *History of the Conqueror* wrote that the Sultan asked Georgios Amoiroutzes, another Byzantine

scholar in his palace, and his Arabic-speaking son to translate the geographical opus of Ptolemy called *Geographike Hyphegesis* or *Geographia* into Arabic and additionally to prepare for him a map of the world based on the above atlas during the summer of 1465. No such a map is extant today, but there are indeed in the Topkapı collection two Greek manuscripts of the *Geographia* (Gİ 27 and 57), while two other manuscripts bearing the Arabic translation of it are held in the Ayasofya collection, which is currently part of the Süleymaniye Library in İstanbul. There are many rumors about maps of the world or the Mediterranean or the Balkans that Mehmed the Conqueror had in hand and used in order to prepare for his campaigns, but none of them has been identified with extant items in the libraries. The certain thing is that the Conqueror was very much interested in geography and cartography and made notable efforts to either bring items of this sort to his palace or attract Western scholars to visit İstanbul in order to prepare them for him. It seems that he did the same with men of letters and artisans, who were already residents of his capital.<sup>110</sup>

The book of the islands by Cristoforo Buondelmonti under the title *Liber Insularum Archipelagi* compiled in 1420-1430 was the first atlas of the islands of

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<sup>110</sup> See Adolf D. Deissmann, *Forschungen und Funde im Serai; Mit einem Verzeichnis der nichtislamischen Handschriften im Topkapu Serai zu Istanbul* (Berlin & Leipzig: Walter de Gruyter, 1933), 68-9 & 89-93; Julian Raby, "Mehmed the Conqueror's scriptorium," *Dumbarton Oaks Papers* 37 (1983): 24. ΛΟΥΠΗΣ, Δημήτρης. *Ο Πρί Ρεϊς (1465-1553) χαρτογραφεί το Αιγαίο. Η Οθωμανική χαρτογραφία και η λίμνη του Αιγαίου* (Αθήνα: Τροχαλία, 1999), 110-113.

the Mediterranean, especially those of the Aegean Sea.<sup>111</sup> His *isolario* (book of the islands) consists of a short text on every island described and a chart of it. The texts give a few instructions to the mariners how to moor in the port of each island, therefore the *Liber* is a sort of sailing-directions text. Buondelmonti's intention was to give a historical and geographical description of the Aegean islands, while he discovered and traced the remains of Greek classical antiquity on them. His work is a result of the rediscovery of classicism and its principles that was taking place in Florence and Central Italy during the Renaissance, and was possibly used by Italians and other Westerner erudites, who traveled *Graecia* (Greece) and wanted to sustain and satisfy their antiquarian interests. Buondelmonti composed his book on the island of Rhodes then under the Hospitalers, nevertheless close to the Ottoman dominion. In Topkapı Palace Library there is a manuscript (Gİ 24) that contains the Greek translation of the *Liber* in vulgar language.<sup>112</sup> There is also a manuscript of *Liber* in Latin, which is preserved in the *Bibliothèque Nationale* in Paris (Lat. Nouv. Acq. 2383) that has inscriptions in Arabic on the charts. This means that once it was property of someone who could not properly read it and asked somebody else to make at least the charts readable. The map of Istanbul has many detailed inscriptions that cannot be found in other copies of the work. The mansion of the Draperii Genoese family is also depicted. The Conqueror had relations with that

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<sup>111</sup> This work is edited in *Christophori Bondelmontii Florentini Librum Insularum Archipelagi*, ed. G.R.L. de Sinner (Lipsiae et Berolini: G. Reimer, 1824).

<sup>112</sup> It was published by LEGRAND, Émile (éd). *Description des îles de l'Archipel par Cgristophe Buondelmonti, version grecque par un anonyme* (Paris: Ernest Leroux, 1897).



family. This may be the environment, where the copy took its final characteristics.<sup>113</sup> In addition, there is a copy of the work *Tārīḥ-i Feth-i Şikloş ve Estergon ve İstolnī Belgrad* by Matrakçı Nasuh, which was composed in 950 (1543-1544).<sup>114</sup> It is held in Topkapı (Hazine 1608). Two folios are bound at the very end of the codex. They are maps of a few Aegean Cycladic islands bearing place names in Arabic<sup>115</sup> and are copies of the above mentioned Buondelmonti Latin manuscript. It is obvious that the two folios have nothing to do with the rest of the codex. They must have belonged to a lost manuscript, which should be connected with the whole Buondelmonti-Conqueror story.

This was a brief presentation of the Ottomans' pre-Pīrī Re'īs efforts that are connected with navigation, navigational instruments of orientation, and geographical knowledge based on the maritime know how. The topic of this thesis is the purely sailing-directions texts that were produced in Ottoman language by the Ottomans during the 16<sup>th</sup> century.

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<sup>113</sup> See LOUPIS, Dimitris. "Ottoman Adaptations of Early Italian Isolarii." *Journal of the International Map Collectors' Society* (London), 80 (2000): 15-23, and ΛΟΥΠΗΣ, Δημήτρης. *Ο Πιρί Ρεΐς (1465-1553) χαρτογραφεί το Αιγαίο. Η Οθωμανική χαρτογραφία και η λίμνη του Αιγαίου* (Αθήνα: Τροχάλια, 1999), 113-117.

<sup>114</sup> Published in facsimile in DURAN, Tülây (ed). *Süleymanname. Tarih-i feth-i Şikloş, Estergon ve İstol-Belgrad. Sinan Çavuş. Süleymanname. History of the conquest of Şikloş, Üstürگون and Üstol-Belgrad. Sinan Çavuş* (İstanbul: Tarihi Araştırmalar Vakfı – İstanbul Araştırma Merkezi, 1999).

<sup>115</sup> See REINDL, Hedda. "Zu einigen Miniaturen und Karten aus Handschriften Matraqçı Naşūh's." Hans Georg Majer (Red.), *Islamkundliche Abhandlungen. Hans Joachim Kissling zum 60. Geburtstag gewidmet von seinen Schülern* (München: Trofenik, 1974): 146-171.

The first endeavor of this kind was the *Kitāb-ı Bahriyye* (Book on Navigation) by Pīrī Reʿīs, which was compiled by his own hand into two versions in 1520-1521 and 1526 respectively. A third version appeared during the second half of the 17<sup>th</sup> century; this is not the subject of this thesis, since the copies of that version were done for presentation to the Sultan, and some more maps were added to them, so that they accomplish the Palace needs for an atlas and a geography manual, not a sailing-directions text any more.

Pīrī Reʿīs's book in its first version was compiled for the mariners to help them on board. It is a sailing-directions manual, but of a more elaborate style. It contains various information on the shores and islands, some even of historical interest. It is a mixed sort of text, since it contains detailed charts, like the *isolario*, together with general instructions like the genre *Arte del navigare* (Art of navigation).

Pīrī Reʿīs was a dominant figure in the intellectual history of the Ottoman 16<sup>th</sup> century. His book was reproduced by both mariners in order to be used on board, as well as by scribes and miniaturists to be offered as a gift to paşas and sultans. He dominated the “century of the sea” in Ottoman history almost entirely without other rivals. Nevertheless, towards the end of the century an almost anonymous Ḥācī Muḥammed Reʿīs appeared to be the author of a pure sailing-directions text. Its title is *Tuḥfetü'l-esrār fî tarîķi'l-biḥār*. It is extant in three copies, the oldest of which bears the date 1005 (1596). It is a relatively short text. Its portolan is of the *traverso* genre, that is a list of distances and compass orientation

between two spots, mainly ports and islands. It deals with all the coastline and islands of the Mediterranean. It is a text to be solely used on board in order to assist the mariners navigate the Mediterranean.

These are the two known Ottoman sailing-directions texts of the 16<sup>th</sup> century. But, there is a third text of this kind that is preserved in a single copy in Vatican, Biblioteca Apostolica Vaticana (Borgiano Turco 72). It is anonymous and contains two portolan-texts, one is a usual portolan-text manual that describes the coasts and islands of the Aegean and the other is a *traverso*. The copy may be dated in the late 18<sup>th</sup> century, nevertheless the text itself resembles the sailing-directions texts of the 14<sup>th</sup>, 15<sup>th</sup> and 16<sup>th</sup> centuries, as are known in style by the Italian texts of that period. The technology it represents is rather old and out of fashion, since at the time of late 18<sup>th</sup> and early 19<sup>th</sup> century the English pilot books and the French equivalents of them are far more modern in terms of technological know how. Most probably it is a late copy of an older text, the roots of which may be traced back to the 16<sup>th</sup> century. This is the reason I decided to add it here.

## 5.1 Pīrī Re'īs, *Kitāb-ı Bahriyye*

“Meger haqq böyle kılmışdı hidāyet  
ki olaydı seyr-i deryā baña ‘ādet

hem öyle oldı bu dehr içre dāyim  
olurdum seyr-i deryāyla kāyim

eger kim kılmısam bir dem sefer ben  
teḳā‘udden çekerdüm çok keder ben

muḥabbet étmiş-idüm cān ü dilden  
ki bir tūşe ireydüm bu ‘amelden.”<sup>116</sup>

The adoption of successful corsairs and pirates,<sup>117</sup> who overrun the Mediterranean Sea from its far western to its far eastern point, was a policy of the Ottoman state. Selection was done among Muslims, nevertheless Christians could also join, but in case they wanted to pursue higher positions, they should convert to Islam, since generally all functionaries selected to serve the state, the so-called *kapı kulları*, were Muslims. The catalogue of the tremendous *brigands of the sea* that served the state was opened dynamically with Hayreddin Barbaros, who almost

<sup>116</sup> Pīrī Re'īs, *Kitāb-ı Bahriyye*, İstanbul, Süleymaniye Ktph., MS. Ayasofya 2612, f. 425a.

<sup>117</sup> For the terms “corsair” and “pirate” see ZAKYTHINOS D. A., *Corsaires et pirates dans les mers grecques au temps de la domination turque* (Athènes, 1939), 8-9: “The campaigns of the pirates were divided into two categories: the systematical enterprises organized in the service of war with the aim to exhaust the enemy fleet, and the single pirate activities done by individuals or groups, whose main object is profit and booty. In the first case the term *corsair* is in use, while in the second the word *pirate*.” In the text of Pīrī Re'īs the terms *ḳōrsān* (corsair) and *ḥarāmī* (pirate) are used.

reestablished, reinforced and stabilized the naval power of the Ottomans, while he expanded it to the shores of Northern Africa<sup>118</sup> with the incorporation of the eyalet of the Mediterranean Sea. The naval activities of the Ottoman corsairs is boosted in the 16<sup>th</sup> century, when they were in collaboration with each other, and followed the one another in the service of the state, like a *school of the sea* for the corsairs, who wanted an official approve of their deeds.

### *The Corsair-Admiral*

Pīrī Re'īs sails into the Mediterranean Sea for the first time at an early age together with his uncle, Kemāl Re'īs.<sup>119</sup> Pīrī Re'īs himself and other Ottoman authors connect his youth years with his uncle. The copies of Pīrī Re'īs's *Book on Navigation* either tell that Kemal Reis was the brother of Pīrī Re'īs's mother or father. The name of Pīrī Re'īs is mentioned in a variety of forms, such as Pīrī Re'īs bin Ḥacc Muḥammed (or Pīrī Re'īs ibn el-Ḥacc Meḥemmed), Hemşīrezāde Kemāl

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<sup>118</sup> For the Northern African pirates see CARIM, Fuad. *Cezayir'de Türk'ler* (s.l.: Sanat Basımevi, 1962). SOUCEK, Svat. "The rise of the Barbarossas in North Africa." *Archivum Ottomanicum* 3 (1978): 238-250. LANE-POOLE, S. *Barbary corsairs* (London: T. F. Unwin, 1890). PRYOR, John H. *Geography, technology, and war. Studies in the maritime history of the Mediterranean, 649-1571* (Cambridge: Cambridge University Press, 1992), 193-196 (for the Ottoman corsairs see pp. 167-171).

<sup>119</sup> For Kemal Reis see BURSKI, Hans-Albrecht von. *Kemal Reis: ein Beitrag zur Geschichte der türkischen Flotte* (Bonn: Bonner Universität, 1928). MORDTMANN, J.H. "Zur Lebensgeschichte von Kemāl Revīs." *Mitteilungen des Seminars für Orientalischen Sprachen zu Berlin* 32.2 (1929): 39-49 & 231-232. KISSLING, H. J. "Zur Tätigkeit des Kemāl-Re'is im Westmittelmeer." *Wiener Zeitschrift für die Kunde des Morgenlandes* 62 (1969): 153-171. KISSLING, H.J. "Kemal-Re'is und der 'Herzog von Catanzaro'," in *Festschrift, Werner Caschel zum siebzigsten Geburtstag* (Leiden: E. J. Brill, 1968), 202-211.

Pîrî Re'îs ibn el-Ḥacc ḥaḳîrî.<sup>120</sup> Mehmed Süreyya calls him Pîrî Muḥyî'd-dîn Re'îs,<sup>121</sup> while Bursalı Tahir gives the name as Aḥmed ibn 'Ālî el-Ḥacc Mehmed Karamanî Larāndevî.<sup>122</sup> His father<sup>123</sup> was originally from Karamania, while Pîrî Re'îs was born in Gelibolu<sup>124</sup> in ca. 1470. The sea life in his native city affected

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<sup>120</sup> HERZOG, Rudolf. "Ein türkisches Werk über das Ägäische Meer aus dem Jahre 1520." *Mitteilungen des Kaiserlich Deutschen Archäologischen Instituts. Athenische Abteilung* 27 (1902): 419.

<sup>121</sup> SÜREYYÂ, Mehmed. *Sicill-i Osmanî yahud Tezkire-i Meşâhir-i Osmâniyye*, haz. Mustafa Keskin, Ayhan Öztürk, Ramazan Tosun, 5 c. (İstanbul: Sebil Yaynevi, 1995-8), 2: 44.

<sup>122</sup> BURSALI MEHMED TÂHİR EFENDİ. *Osmanlı Müellifleri, 1299-1915*, haz. A. Fikri Yavuz & İsmail Özen, 3 c. (İstanbul: Meral Yaynevi, 1972-5), 311-312.

<sup>123</sup> Burski states that Kemal Reis was born at the time of the fall of Constantinople in Christian parents, while later he became *kapı kulu*. thus, since the mother of Pîrî Re'îs was sister of Kemal Reis, then Pîrî Re'îs has Greek of Frankish origin in half. See BURSKI, 19 and KAHLE, Paul. "Piri Re'îs und seine Bahrîje." In Hans von Mžik (Hrsg), *Beiträge zur historischen Geographie, Kulturgeographie, Ethnographie und Kartographie, vornehmlich des Orients. Prof. Dr. Eugen Oberhummer zur Vollendung seines 70. Lebensjahres am 29. März 1929 überreicht* (Leipzig & Wien: Franz Deuticke, 1929), 65. On the contrary MORDTMANN does not consider him a Gree: "... war Kemâl Re'îs sicher ein geborener Türke, kein griechischer Sklave oder Renegat (p. 48)." Mantran is putting the issue on a more solid base, giving priority not to the ethnic origin, but the personal preference of an individual to follow a certain way of life and culture: "Que certains des corsaires et marins ottomans aient été d'origine grecque n'enlève rien aux résultats obtenus, car ces Grecs se sont, pour une large part, "ottomanisés" et islamisés et sont devenus des agents actifs du pouvoir turc: on en veut pour preuve le fait que les noms des grands chefs maritimes ottomans de la fin du XVe siècle et du XVIe sont tous des noms "musulmans". Il serait effectivement difficile de concevoir une flotte "ottomane" commandée par des "chrétiens", même sujets du sultan. Cependant, le recours aux chrétiens n'est pas absent, car on sait que dans les arsenaux de la marine ont travaillé des techniciens occidentaux (génois, notamment), que dans la flotte commerciale ottomane nombre de bâtiments sont commandés par des Grecs, et que, par opportunisme, des chrétiens - en particulier des Grecs des îles de la mer Égée - se sont ralliés (sans parler de ceux qui se sont convertis et se sont turquifiés), apportant ainsi aux Ottomans, traditions et techniques maritimes: mais tout cela se fait au nom de l'Empire ottoman. Un témoignage notoire est celui des frères Barberousse (Oroudj et Khayr ed-din) qui contribuèrent à l'intégration d'une partie du Maghreb dans le domaine ottoman et dont les proches ancêtres étaient des Grecs de Mytilène." See MANTRAN, Robert. "La description des côtes méditerranéennes de la France dans le *Kitâb-i Bahriye* de Pîrî Reis." *Revue du Monde Musulman et de la Méditerranée* 39 (1985): 70-71.

<sup>124</sup> For Gelibolu see KURTOĞLU, Fevzi. "XVIncı asrın ilk yarımında Gelibolu." *Türkiyat Mecmuası* 5 (1935): 291-306, İNALCIK, Halil. "Türk donanmasının beşiği: Gelibolu." *Türk Kültürü* 22 (1964): 57-60, and İNALCIK, Halil, "Gelibolu," in *EF*.

him and soon followed his uncle, Kemal Reis. During that period of apprenticeship they were active pirates in Maghreb, Tunisia, and Algeria. They were attacking the ships and shores of Spain, France, Italy and the great islands of the Mediterranean.<sup>125</sup> Until the year 900 (1495), when the Ottoman sultan called Kemal Reis in his service, Pīrī Reʿīs sailed all around the Mediterranean, got acquainted with its waters, shores and people who lived around it. He learned the art of seamanship, the use of astronomical instruments and charts, came in contact with the European achievements of nautical science and as an experienced and skilled mariner abandoned the life of a pirate to enter the service of the sultan. Till the death of his uncle in 917 (1511) he took part in numerous missions in Egypt of the Mamluks, the Aegean and Eastern Mediterranean fighting the Hospitalers of Rhodes. Having Djerba (Tunisia) as a base he transferred Muslim and Jewish refugees from Spain to Northern Africa and the Ottoman territories. After the war with Venice in 1499-1502 he obtained his own vessel, and soon after the death of Kemal Reis, he worked together with Hayreddin Barbaros in Northern Africa.<sup>126</sup> Barbaros in his *Deeds* relates stories of their collaboration.

He spent the following years at Gelibolu, where he prepared two maps and a book on navigation. From the little information we have, we know that his activities were restricted in the Aegean and Eastern Mediterranean. In 1547 he

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<sup>125</sup> These events are mentioned in Pīrī Reʿīs, *Kitāb-ı Bahriyye*, Istanbul, Süleymaniye Ktph., MS. Ayasofya 2612, ff. 322a, 327b, 330b, 336a, 298b, 281a-281b, 6a, 5b.

<sup>126</sup> SOUCEK, Svat. "Tunisia in the *Kitab-i Bahriye* by Piri Reis." *Archivum Ottomanicum* 5 (1973): 130.

became Admiral of the Ottoman Fleet in the base of Suez. That time he managed to take back Aden from the Portuguese in 1549. He was entitled Admiral of India (Hind Kıpudan-ı Deryā) in 1547 and Admiral of Egypt (Mıŝır Kıpudan-ı Deryā) in 1551.<sup>127</sup> During the conflicts in the Indian ocean, where the Ottomans and Portuguese were fighting for supremacy, once he acted in a non-successful way, which resulted into the decision of the Ottoman sultan to decapitate him in Cairo in 961 (1553-1554).

### *The Panorama of the World*

Pīrī Re'īs produced two portolan-charts in Gelibolu. The first one was designed in 1513, while the second in 1528. Nowadays they are preserved only in fragmental form in Topkapı Palace Library (R 1633 mükerrer, and H 1824, respectively).<sup>128</sup> Both fragments depict parts of America, while the oldest and bigger one has been discussed a lot, especially for the designing of the coastline of America and Antarctica in such an early time. I am not going to deal here with

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<sup>127</sup> EZGÜ, Fuat. "Pīrī Re'īs," *İslam Ansiklopedisi*, 563a.

<sup>128</sup> There is a huge bibliography on Pīrī Re'īs and his charts, which are analyzed the best way in McINTOSH, Gregory C. "Christopher Columbus and the Piri Reis map of 1513." *The American Neptune* 53.4 (1993): 280-94. McINTOSH, Gregory C. *The Piri Reis Map of 1513* (Athens & London: The University of Georgia Press, 2000). SOUCEK, Svat. *Piri Reis and Turkish mapmaking after Columbus-The Khalili Portolan Atlas* (London: The Nour Foundation - Azimouth Editions - Oxford University Press, <sup>2</sup>1996), 49-79. SOUCEK, Svat. "Islamic Charting in the Mediterranean," in *The History of Cartography*. vol. 2, book 1. *Cartography in the Traditional Islamic and South Asian Societies*, eds. J.B. Harley and David Woodward (Chicago & London: the University of Chicago Press, 1992), 265-272.



these charts, but with the portolan-text under the title *Kitāb-ı Bahriyye* (Book on Navigation) that Pīrī Re'īs composed in 1520-1526.

This is a lengthy mixed portolan-text of the Mediterranean, which combines sailing directions enriched with a variety of information with detailed charts of coasts and islands according to the tradition of the *isolario*. Pīrī Re'īs produced two<sup>129</sup> versions of his work. The first version dated 1520-1521,<sup>130</sup> consists of a brief foreword in prose, then follow 131 chapters, each of which refers to a geographical unity of an island, a coast or a port accompanied by its chart. The book begins from the Dardanelle straits and islands, then goes to the shores and islands of Northern Aegean, the islands of Eastern Aegean and its shores, the Dodecanese, the Cyclades, Attica, Peloponnesus, the Ionian islands, The Illyrian and Dalmatian shores, Venice, the shores of the whole Italian peninsula,<sup>131</sup> Sicily, Sardinia, Corsica, the French

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<sup>129</sup> A later third version, which combines elements from both the first and second versions, was a result of the addition of more charts to the original work. It was not done by PR, but by other mariners, scribes, miniaturists and men of letters. See LOUPIS, Dimitris. "Piri Reis' Book on Navigation (Kitab-ı Bahriyye) as a Geography Handbook. Ottoman Efforts to Produce an Atlas during the Reign of Sultan Mehmed IV (1648-1687)." In *Eastern Mediterranean cartographies*, edited by George Tolias and Dimitris Loupis, Tetrada Ergasias 25/26 (Athens: Institute for Neohellenic Research, National Hellenic Research Foundation, 2004), 35-49.

<sup>130</sup> The date of composition is given like this: "... tāriḥ doḡuz yüz yigirmi yedi yılında iken nefs-i Gelibolida tertīb üzerine bir yere cem' ederken evvel şerḫleri yazılıub ba'dehu ol maḫalleri ve şekilleri resm olundu (... in the year 926 [1520-1521] and at the city of Gelibolu I collected and composed [this work], after having written first the directions and then designed the places and their charts)." See, Pīrī Re'īs, *Kitāb-ı Bahriyye*, Bologna, Biblioteca Universitaria di Bologna, MS. 3613, f. 4a. The first version was published incompletely in KAHLE, Paul. *Piri Re'īs Bahriyye. Das türkische Segelhandbuch für das Mittelländische Meer vom Jahre 1521*, Band Ia (Text, Kapitel 1-28), Ib (Text, Kapitel 29-60), IIa (Übersetzung, Kapitel 1-28), (Berlin-Leipzig: Walter de Gruyter, 1926-7).

<sup>131</sup> Bausani states that Pīrī Re'īs had a better knowledge of the Adriatic instead of the Tyrrhenian Sea: "... l'Autore sembra conoscere meglio le coste adriatiche che quelle tirreniche." See BAUSANI, A. "Le coste toscane nel Kitab-i Bahriyye di Piri Reis," in

and Spanish shores, the Balearic Islands, Gibraltar, the coasts of Algeria, Tunisia, Libya, Egypt, Eastern Mediterranean, Cyprus, the southern shores of Asia Minor, Crete, the rest of the Aegean islands, and ends with the Dardanelles and the sea of Marmara. In some of the copies there are charts of Istanbul,<sup>132</sup> too. The text consists of sailing directions for the nature of waters (depth, clarity, quality of seabed) and shores, approachability, the distinctive marks of the ports (identification from distance, ways of approach, wideness, capacity, protection from winds, friendliness or hostility of the locals), the possible potable water resources, and a few historical or pseudo-historical information.

The second version dated in 932 (1526)<sup>133</sup> was prepared in order to be offered to the sultan Süleyman as a present while in Cairo, after the Grand Vizier, İbrahim Paşa prompted Pīrī Re'īs to do so in 1524. The author did improvements

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GALLOTTA, Aldo, e Ugo Marazzi (a cura di). *Studia turcologica memoriae Alexii Bombaci dicata* (Napoli: Istituto Universitario Orientale, 1982), 30.

<sup>132</sup> KAHLE, *Bahriye*, xlv-xlvi.

<sup>133</sup> See KAHLE, Paul. "Piri Re'īs und seine Bahriye." In Hans von Mžik (Hrsg), *Beiträge zur historischen Geographie, Kulturgeographie, Ethnographie und Kartographie, vomehmlich des Orients. Prof. Dr. Eugen Oberhummer zur Vollendung seines 70. Lebensjahres am 29. März 1929 überreicht* (Leipzig & Wien: Franz Deuticke, 1929), 61-66. The date of composition is given like this: "İmdi 'ale't-tafşıl mezkūr қаdiyeleri bi't-tamām yazdum. Tā şof zamāna gelince kim Hicret-i Nebī 'Aleyhi's-selām tārīhi doқuz yüz otuz iki yılında idi. Mezkūrüñ maқāmatuñ eşkālın şerhleri ile nefsi-i Gelibolıda bir yere cem' eyledüm, İşbu kitāb haşıl oldı... (Now, as it was mentioned before, I wrote for all relevant issues. And this took place in the year 932 [1526] of the Egira of the Blessed Prophet. The same aforementioned locations' designs and directions I collected together in the city of Gelibolu. This is how this book came up...)." See Pīrī Re'īs, *Kitāb-ı Bahriyye*, İstanbul, Süleymaniye Ktph., MS. Ayasofya 2612, f. 3b. The year 932 corresponds to 1525-1526 of the common era. Dr. José Barral kindly directed my attention to an element from within the text that makes us give a more specific date, and I would like to thank him here. In the Ayasofya 2612 copy, folio 325b, there is a reference to the last Hafsīd Abu Muhammad al-Hasan, whose ascension to the throne was on the 25<sup>th</sup> of Rebiul-ahir 932 (8 February 1526). So the second version must have been completed in between 8 February and 7 October 1526, when the year 932 was ended.

and changes in the text, which became longer, nevertheless not much different from the first version.<sup>134</sup> In the case of Algeria and Tunisia, the text and toponymy mentioned are diminished, as well as the relations on corsairs of the region.<sup>135</sup> A considerable improvement may be observed in the charting qualities.<sup>136</sup> New measurings and observation on the spot, together with the use of updated sources resulted into more balanced orientation, more accurate charts and a better general condition. The second version consists of 219 chapters. For instance the 9 charts on the Adriatic from the first version become 60 in the second, while the coast from Gibraltar to the Nile delta is analyzed in 28 charts, out of the 8 of the first version.<sup>137</sup> A long prologue in verse, written with the assistance of the poet Muradi<sup>138</sup> is added. It is the first theoretical text on the art of navigation in Ottoman language. It provides information on the winds and the orientation, the use of compass and chart, together with astronomical, as well as geographical knowledge

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<sup>134</sup> As far as the region of the Aegean Sea is considered, the chapters nr. 33 on Kandeliousa/Kalogeros Islet, and Astypalaia (nr. 114) are not included in the second version. In some cases Pīrī Re'īs omitted brief historical or pseudo-historical information from the second version, such as the ones that were in the chapters on Samothrace, Lemnos, Thassos, Thessaloniki, Euboia, Mytilene, Chios, Agathonisi, Patmos, Symi and Rhodes in the first version.

<sup>135</sup> SOUCEK, Svat. "Pīrī Re'īs," *EF*<sup>2</sup>, 309a.

<sup>136</sup> For the depictions of cities see CUNEO, Paolo. "The urban iconography in the works of Piri Reis and Matrakçı Nasuh, between geometrical abstraction and topographical accuracy." *II. Uluslararası Türk-İslam Bilim ve Teknoloji Tarihi Kongresi, İ.T.Ü., 28 Nisan – 2 Mayıs 1986* (İstanbul: İstanbul Teknik Üniversitesi Bilim ve Teknoloji Tarihi Enstitüsü, 1986-1987), 1: 263-268.

<sup>137</sup> GOODRICH, Thomas D. "Supplemental maps in the *Kitab-i Bahriye* of Piri Reis." *Archivum Ottomanicum* 13 (1993-1994): 118.

<sup>138</sup> YURDAYDIN, Hüseyin G. "Kitâb-ı Bahriyye'nin telifi meselesi." *A.Ü.D.T.C.F.D.* 10.1-2 (1952): 143-146.

on the whole known world. An epilogue in verse is at the end of the book; it deals with the reasons why this work was written and improved and presents the final result in front of god, the sultan, of the knowledgeable people and the youth.

There are some 42 copies of *Kitāb-ı Bahriyye* known to exist in various libraries in Turkey and abroad. The copies of the first version were produced by mariners in order to be used aboard and some of them bear clearly the results of such a use, spots of sea water affected the condition of some of them, while there are numerous marginal additions to the charts and a few to the text. The second version was produced from the beginning for presentation, thus found itself in a different environment of the sultan's palace and private libraries.<sup>139</sup> These copies are made with high quality materials, are well decorated, while the text and the legends are neatly and legibly written.

The oldest extant and dated copy is from 1551 (Süleymaniye, Yeni Cami 790) and the latest is dated 1770 (Süleymaniye, Hüsrev Paşa 264).<sup>140</sup> This means

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<sup>139</sup> Soucek states that the mariners did not need the depiction of the city of Venice and Cairo, the course of Nile, and the cities on the shores of Dalmatia and Anatolia, elements that were not so expanded or even absent in the first version. See SOUCEK, Svat. "À propos du livre d' instruction nautiques de Pîrî Re'îs." *Revue des Études Islamiques* 91.2 (1973): 250.

<sup>140</sup> There are three recent preliminary lists of the known *Bahriyye* copies. Soucek with the assistance of Goodrich published the first in *Cartography in the Traditional Islamic and South Asian Societies*, eds. J.B. Harley and David Woodward (Chicago & London: the University of Chicago Press, 1992), 290-292. İhsanoğlu and his group presented another list in İHSANOĞLU, Ekmeleddin (ed.). *Osmanlı coğrafya literatürü tarihi*, 2 vols. (İstanbul: IRCICA, 2000), 23-25. A third list may be found in ESİNER ÖZEN, Mine. *Pîrî Reis and his charts* (İstanbul: N. Refioğlu, 1998), 20-22. To those copies should be added: the Paris, Bibliothèque Nationale, MS. Suppl. Turc 219, which is a manuscript with an incomplete text only, and the two Czech National Library (Klementinum) copies in Prague. They are the MSS XVIII A 42 and XVIII A 308. The first copy has 118 folios and no maps, while the second has 6+181+136+3 folios including maps. The latter has a copy of an edict added after the end of the incomplete text, which dates Ra 1013 (ca. August 1604). I thank Prof. Christoph K. Neumann for that kind information.

that within a period of two centuries Pîrî Re'îs's book was copied and used for various purposes, as sailing directions, or atlas or handbook of geography. The work was translated into French in 1765 by M. Cardonne under the title *Le Flambeau de la Méditerranée*.<sup>141</sup> In 1811 Diez<sup>142</sup> made the original known in his own book, then followed Hammer,<sup>143</sup> later on Kalau<sup>144</sup> short mention, and finally Kahle<sup>145</sup> presented a critical edition based on few copies of the first version, which nevertheless, was not published in full. The best copy (MS. Süleymaniye, Ayasofya 2612) of the second version was reproduced in a facsimile in 1935 and again in 1988,<sup>146</sup> while a very problematic quasi-facsimile edition appeared recently.<sup>147</sup>

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<sup>141</sup> The manuscript is preserved in Paris, Bibliothèque Nationale, MS. F.F. 22972.

<sup>142</sup> DIEZ, Heinrich Friedrich von. "Beschreibung eines See-Atlases oder einer Sammlung von fünfzig, eigentlich hundert fünf und neunzig geschriebenen türkischen Seekarten mit Erklärungen in türkischer Sprache in gross Folio." In H.F. von Diez, *Denkwürdigkeiten von Asien* (Berlin: Commission der Nicolaischen Buchhandlung, 1811), 1: 33-71.

<sup>143</sup> HAMMER-PURGSTALL, Joseph von. "Über den türkischen See Atlas des Piri Reis." *Hertha. Zeitschrift für Erd-, Völker- und Staatenkunde* 5 (1826): 99-131. I thank Dr. José Barral for letting me know of this article.

<sup>144</sup> KALAU von Hofe-Pascha. "Eine türkische Segelanweisung für das Mittelmeer vom Anfang des 16. Jahrhunderts (Kitab ül bachrijé)." *Marine-Rundschau* 10.1 (1899): 449-460.

<sup>145</sup> KAHLE, Paul. *Piri Re'îs Bahrîje. Das türkische Segelhandbuch für das Mittelländische Meer vom Jahre 1521*, Band Ia (Text, Kapitel 1-28), Ib (Text, Kapitel 29-60), IIa (Übersetzung, Kapitel 1-28), (Berlin-Leipzig: Walter de Gruyter, 1926-7).

<sup>146</sup> PÎRÎ RE'ÎS, *Kitab-ı Bahriye*, ed. by E. Z. Ökte, 4 vols (Ankara: The Historical Research Foundation - Istanbul Research Center, 1988).

<sup>147</sup> PÎRÎ RE'ÎS. *Kitab-ı Bahriye, Book of Navigation*, ed. by Bülent Arı (Ankara: Republic of Turkey, Prime Ministry, Undersecretaryship of Navigation, 2002).

### *A Link to the Chain*

In the art of navigation it is important to realize the chain-like communication and interpolation of the works, which through successive amendments, adopting and rejections, went on in the science of depicting the surface of the earth. In the history of cartography and hydrography it is easy to recognize the previous knowledge within the new, and in the case of Pīrī Re'īs lead the research into the centers of navigational know how during the 16<sup>th</sup> century, mainly Italy and secondly Spain.<sup>148</sup>

This is the area, where Pīrī Re'īs's sources may be traced.

In his own works there are many references to older geographical and cartographical works, which he knew and possibly used.<sup>149</sup> On a lengthy note on the chart of 1513, Pīrī Re'īs states that in order to design his own map, he consulted “twenty maps and *mappa mundi*,<sup>150</sup> that is maps from the era of Alexander the Great, which depicted the inhabited parts of the world. The Arabs call them *ca'feriyye*.<sup>151</sup> From eight *ca'feriyyes* of this kind, an Arabic chart of India, four new

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<sup>148</sup> See CORTESÃO, Armando. *Cartografia e cartógrafos portugueses dos séculos XV e XVI*, 2 vols. (Lisboa: Edição da 'Seara nova', 1935), 1: 8.

<sup>149</sup> “Çü her bir bende bir kolpa yapışdı. Anuñ-ile varub luřfa yetişdi (The knowledge of other I looked for and with this I succeeded my felicitous aim).” Pīrī Re'īs, *Kitāb-ı Bahriyye*, Istanbul, Süleymaniye Ktph., MS. Ayasofya 2612, f. 427a.

<sup>150</sup> Expression used for a specific type of maps of the world designed within a circle. In older texts, the term means *maps* of great scale in general.

<sup>151</sup> By mistake the word *cugrāfiyā* was read *ca'feriyye*. It is obvious that behind this word is hidden the famous Ptolemaic work *Geographike Hyphegesis*. The Arab geographer al-Zuhri (12<sup>th</sup> century) gave his work the title *Ca'rāfiya*, which was another Arabic pronunciation of the Greek term *Geographia*. See *Cartography in the Traditional Islamic and South Asian Societies*,

Portuguese charts of the Indian and Chinese lands geometrically designed, and a map of Columbus on the West, I composed this chart harmonizing everything that I had in hand. This chart is accurate and reliable, as accurate and reliable as the aforementioned charts of the Seven Seas.”

In the *Book on Navigation* there are references on new maps of the Chinese and Indian seas (MS. Ayasofya, f. 3a), and information on them acquired through Portuguese.<sup>152</sup> We have already seen that Pīrī Re’īs acquired a map of Columbus and Ptolemaic geographies.<sup>153</sup> If the texts of Pīrī Re’īs and Ptolemy are put in

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eds. J.B. Harley and David Woodward (Chicago & London: the University of Chicago Press, 1992), 157. It is possible that Pīrī Re’īs heard the title of the Arabic work, than seen it written, if his interest was concentrated entirely on the maps of the work, as expected, and not on the Arabic text, which would be unapproachable to him.

<sup>152</sup> “İmdi bildüñ Çin ilinüñ hālını Portuqal şerh êtdügi ahvālını. Portuqaldan hem sū’āl êtdüm bunu ya’ni Çin-i Çananuñ toprağını (Now, you learned about the Chinese land, as the Portuguese relate. I asked the Portuguese for this, the lands of China, I mean).” See, MS. Ayasofya, ff. 27a-27b.

<sup>153</sup> In the MS. Ayasofya, ff. 41b-42a we read on the Ptolemaic work and its use by the Europeans the following: “Cümle deryâ ‘ilmini Efrenc, êy yâr, hem yazarlar hem okurlar her ne var./Şanma ilhrâc ide anlar kendüden diler iseñ, diyeyim anı neden./Ol zamân kim şâh-ı İskender benâm gezmiş idi işbu deryâyı tamâm./Ne görüb işiddiye, êy kişi, yazdururdu her yerin her bir tuşu/işbu veche cümle deryâyı tamâm cem’ edüb yazdurmuş idi, ol hümâm./Ol kitâbuñ cem’i Mışırda, êy yâr, kılmuş imiş bil ki anda ber-ķarâr./Müddet ile soñra Efrenc geldiler cem’ olub Mışruñ içine döldiler./‘Amr bin ‘Âş çün Mışra ķaşd eder, diñle, Mışruñ halkı dahî gör nider./çünkü Mışır fethine olur nişân kaçır içinden ekâbir ü ‘ayân./Ya’ni kim Efrenc iline kaçdılar öteden deryâyı beri geçdiler./Ol kitâbı kim dimişdüm, êy yâr, ķaldı İskenderden anda yâdigâr/cem’in anuñ bile alub kaçdılar bunda gelüb nice yerler acdılar./Tercüme êtdiler anı bir bir tamâm kendüler dilince êtdiler benâm./Bunuñ aşlın bilmek isterseñ ‘ayân tercüme kim eyledi idem beyân./Bortolomye dirler imiş bir kişi tercüme ol eylemiş işbu işi./Puşulanuñ hârıtınuñ ahvālını soñra ol yazmış tamâm her hālını./Andan evvel dahî soñra niçeler her biri fıkr eylemiş kim göçeler (The Europeans, my friend, the knowledge of the whole sea write and read. And do not think it is theirs. I am going to talk to you about this. Once Alexander the Great navigated the whole sea and he wrote down in details whatever he saw and heard. Thus he collected and wrote the knowledge of the whole sea. That book, my friend, was written in Egypt, and remained over there. Later on the Europeans came and conquered Egypt. When Amr bin As intended to conquer Egypt [in A. D. 641], look what its people did. When it was apparent that the country would be dominated, the leaders abandoned

contrast, it seems that there is no impact of the older to the newer. The Greek text and its Latin translation, the toponymy and the rest of the terminology of which would reveal a possible relation, are unknown to the Ottoman author. The maps of Ptolemy as well cannot be traced in Pīrī Re'īs's technique, too. It is obvious that Pīrī Re'īs had no Ptolemaic text in hand; the Greek and Arabic manuscripts of it in Topkapı and Ayasofya collection were not known to him. Nevertheless, Ptolemy is a vivid cartographical practice in the work of Pīrī Re'īs, because he is the basis of his sources. Pīrī Re'īs himself stated that he used seven maps of Ptolemy, but it seems that it meant maps that used the Ptolemaic technique. If for Pīrī Re'īs Alexander the Great represents whatever classical Greek, then Ptolemy is connected with the Italian Renaissance, a more *recent*, though, *antiquity* according

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it. They went to Europe crossing the sea from the one side to the other. And they took together with them the book that was from the era of Alexander and conquered some other lands. They translated the whole book into their own languages. And if you want to know, who did the translation, listen: Bortolomye was the man who did it. He wrote for the compass and the chart in the beginning and then for the rest. Before and after him many people wrote down their own ideas about navigation)." This text is discussed in BAGROW, L. "Supplementary notices to *The Origin of Ptolemy's Geographia*." *Imago Mundi* 4 (1946): 71-72. *Bortolomye* seems to be Ptolemy, the Islamic version of whose is *Baṭlamiyūs*, which may be easily confused with *Bortolomye*. Pīrī Re'īs, according to the aforementioned passage attributes the Greek manuscripts of the Ptolemaic geography to Alexander the Great, while the most common at the time translations of it into Latin ascribes to *Bortolomye*. In both cases the author is, of course, Claudius Ptolemy. See KAHLE, Paul. "Piri Re'īs und seine Baḥrīje." In Hans von Mžik (Hrsg), *Beiträge zur historischen Geographie, Kulturgeographie, Ethnographie und Kartographie, vornehmlich des Orients. Prof. Dr. Eugen Oberhammer zur Vollendung seines 70. Lebensjahres am 29. März 1929 überreicht* (Leipzig & Wien: Franz Deuticke, 1929), 66. It is not possible that this person is Bartolomeo [dall'i Sonetti], since he does not refer to compass and chart in the introduction of his *isolario*, as Pīrī Re'īs states. Kissling in his study on the Pīrī Re'īs text on river Rhones in Southern France thinks that Pīrī Re'īs may have used the Latin or Italian translation of the Ptolemaic geography from a manuscript, less from a printed book of the Cussanus version. See KISSLING, Hans Joachim. "Zur Beschreibung des Rhône-Deltas in der Bahriye des Piri Re'īs." *İstanbul Üniversitesi Edebiyat Fakültesi İslâm Tetkikleri Enstitüsü Dergisi* 5.1-4 (1973): 285 & 287.



to the perception of history and prehistory that a citizen of the world, established and defined in time by the House of Osman, could have.

The Ottoman author seems to have known the first globes, as he relates (MS. Ayasofya 2612, ff. 19b-20b) a story about a priest who traveled a lot. When he was in Portugal, he made a globe like an apple that depicted lands and seas, and showed the way from Europe to China. This must be identified with the oldest extant globe, the one produced by Martin Behaim in 1492 and is preserved in the Germanische National Museum in Nuremberg.<sup>154</sup>

Nevertheless, Pīrī Re'īs does not mention the first Italian *isolari* that he used as sources for the design of a series of his charts.<sup>155</sup> Among these works are

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<sup>154</sup> On Behaim see BOTT, G. *Focus Behaim*, 2 Bde (Nürnberg: Germanisches National Museum, 1992). RAVENSTEIN, E.E. *Martin Behaim, his life and his globe* (London: G. Philip & Son, Ltd., 1908).

<sup>155</sup> In a detailed research done here, it seems that Pīrī Re'īs did not use the following Italian navigational literature:

- The Italian portolan-texts published in KRETSCHMER, Konrad. *Die italienischen Portolane des Mittelalters. Ein Beitrag zur Geschichte der Kartographie und Nautik* (Berlin: Institut für Meereskunde und Geographisch Institut an der Universität Berlin, 1909; reprinted Hildesheim: Georg Olms, 1962).
- NORDENSKIÖLD, A.E. *Periplus. An essay on the early history of charts and sailing-directions*, translated from the Swedish original by Francis A. Bather (Stockholm: [P.A. Norstedt & Söner], 1897; reprinted New York: Burt Franklin, 1964), 76-78.
- GAUTIER DALCHÉ, Patrick. *Carte marine et portulan au XIIIe siècle. Le Liber de Existencia Riveriarum et Forma Maris Nostri Mediterranei, Pise, circa 1200* (Rome: École Française de Rome, 1995).
- MOTZO, Bacchisio R. (ed). *Il compasso da navigare, opera italiana della metà del secolo XIII* (Cagliari: Facoltà di Lettere e Filosofia de la Università di Cagliari, 1947).
- TERROSU ASOLE, Angela. *Il portolano di Grazia Pauli. Opera italiana del secolo XIV trascritta a cura di Bacchisio R. Motzo* (Cagliari: Consiglio Nazionale delle Ricerche, Istituto sui Rapporti Italo-Iberici, 1987).
- The unpublished Anonymous, [*Portolano*], Venice, Museum Civico Correr, MS. Port. 22, which is dated in 1490 or 1527.
- *Opera Nova chiamata portolano laqual narra tutte le terre: & porti de leuante cominciando a Venetia andando per tutta la Schiauonia fin a Corfu con tutta la*

the works by Cristoforo Buondelmonti and Bartolomeo [dalli Sonetti] that were already mentioned. A third isolario published by Benedetto Bordone in 1528 seems to have not been a source for Pīrī Re’īs, since it is dated after the dates of the *Bahriyye*. It seems that they have common features, but this is due to their common sources, mainly Sonetti.

As far as the design of the charts is concerned, we observe that Pīrī Re’īs changelessly used Sonetti<sup>156</sup> and not Buondelmonti.<sup>157</sup> The common elements are

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*Grecia la Morea & Napoli de Romania con tutto Larchipelago: Constantinopoli Candia Rodi Cipro & tutto il Leuante & tutte le isole: terre citta e castelli & porti & quanti miglia da una terra a laltra & da una isola a laltra: & tutte starie porti valle e colphi: scagni: fondi: e sechi dintorno. Novamente stampato* (Vineggia: Domenego Zio & Fratelli Veneti, s. d. [ca.1518]).

- COPPO, Pietro. *Portolano* (In Venetia: per Augustino di Bindoni, 1528; reprinted Trieste: Lindt 1985).
- *Nuovo Portolano non piv stampato molto particolare de’l Levante a de’l Ponente* (Vineggia: Pavlo Gerardo, 1544).
- *Portolano Opera Nova qual narra tutte le Isole, Terre, Citta, Castelli, Porti, Starie, valli, colphi, scagni, fondi, di Leuante, cominciando a Venetia, andando per la Schiauonia fino a Corfu, la Grecia la Morea, Arcipelago, Costantinopoli, Candia, Rodi, Cipro con tutto il Leuante quante miglia, e da vna isola a l’altra, e da vna terra a l’altra, cosa molto vtile* (In Venetia: per Mathio Pagan, 1558).
- Antonio Millo, *Isolario et Portolano de tuto el Mare Mediterraneo...*, Venice, Museum Civico Correr, MS. Correr 904.
- CRESCENTIO, Bartolomeo. *Portolano della maggior parte de’luoghi da stantiar navi, et galee in tutto il Mare mediterraneo, con le sue traversie, & luoghi pericolosi* (In Roma: appresso Bartolomeo Bonfadino, 1602).

<sup>156</sup> I studied the following copies of the work:

- DALLI SONETTI, Bartolommeo. *Isolario, Venice 1485*, with an introduction by Frederick R. Goff (Amsterdam: Theatrum Orbis Terrarum, 1972).
- Bartolomeo [dalli Sonetti], [*Isolario*], Venice, Biblioteca Nazionale Marciana, MS. Italiani Cl. 9 No 188.
- Bartolomeo [dalli Sonetti], [*Isolario*], printed Venice, ca. 1485, with handwritten place names, Vienna, Österreichische Nationalbibliothek, Ink. II. D. 43.
- Bartolomeo [dalli Sonetti], [*Isolario*], printed Venice, ca. 1485, with handwritten place names in Greek, New York, Pierpont Morgan Library, PML 338.

more obvious in the *Bahriyye* copies of the first version. Pīrī Re'īs followed the convention of Sonetti to design the islands over a compass with the *fleur de lys* sign showing the North, used dots as signs for the reefs and shallows, and crosses for shoals, the schematic forms of the coast,<sup>158</sup> islets, cities, castles, rivers and fountains. On the contrary, the mile indicators of Sonetti were not used. The charts that present the higher percentage of copying are those of the islands under Venetian domination, which became Ottoman after the completion of *Bahriyye* by

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In the copy of the Pierpont Morgan Library were added handwritten place names over the charts by a later hand of the 17<sup>th</sup> century. The version of them resembles the way toponymy is presented in the Greek portolan-texts, nevertheless Pīrī Re'īs's text seems to have no relation with any of the special features of this copy, for instance the place names and the rude coloring of the charts.

<sup>157</sup> I studied the following copies of the work:

- Christoforus Buondelmonti, *Liber Insularum Archipelagi*, Paris, Bibliothèque Nationale, MS. Lat. Nouv. Acq. 2383.
- Christoforus Buondelmonti, *Liber Insularum Archipelagi*, Athens, Gennadeios Library, MS. 711.
- Christoforus Buondelmonti, *Liber Insularum Archipelagi*, Venice, Biblioteca Nazionale Marciana, MS. Lat. X., 123.
- Christoforus Buondelmonti, *Liber Insularum Archipelagi*, Venice, Biblioteca Nazionale Marciana, MS. Lat. X., 158.
- Christoforus Buondelmonti, *Liber Insularum Archipelagi*, Venice, Biblioteca Nazionale Marciana, MS. Lat. X., 215.
- Christoforus Buondelmonti, *Liber Insularum Archipelagi*, Venice, Biblioteca Nazionale Marciana, MS. Lat. XIV., 25.
- Cristoforo Buondelmonti, *Isolario dell'Archipelago* [*Liber Insularum Archipelagi*], Venice, Biblioteca Nazionale Marciana, MS. It. VI., 19.
- *Christophori Bondelmontii Florentini Librum Insularum Archipelagi*, edited by G.R.L. de Sinner (Lipsiae et Berolini: G. Reimer, 1824).
- BUONDELMONTI, Cristoforo. *Descriptio Insule Crete et Liber Insularum, cap. XI: Creta*, édition critique par Marie-Anne van Spitael (Ηράκλειον Κρήτης: Σύλλογος Πολιτιστικής Αναπτύξεως Ηρακλείου, 1981).

<sup>158</sup> While checking the manuscript in Venice, Biblioteca Nazionale Marciana, MS. Italiani Cl. 9 No 188, we observe that the thick double-colored coastline on the charts resembles the one that Pīrī Re'īs often used in contrast with the slim and curly coastline met in the printed version of the Sonetti Isolario.

Hayreddin Barbaros (1537-1538) and later. They are the islands of Cythera,<sup>159</sup> Melos, Siphnos (1617), Kythnos, Kea (1617), Andros, Tenos, Mykonos, Siros, Kalogeros, Lemnos, Kyra Panagia, Scyros, Allonessos, Sciathos, Scopelos, Euboia, and Cyprus (1571). From the aforementioned islands, Lemnos is Ottoman since 1456, while Euboia since 1470. Most of the islands of the two groups depicted in the following table belong to this group. Minor varieties are met in the charts of Crete (1654-1669), Carpathos, Serifos, Paros, Cos, Calymnos, Ikaria, Chios (1566), Mount Athos and Argolis. From this group, Calymnos becomes Ottoman in 1522, Cos in 1523 –one or two years after the first *Bahriyye* version-, while Ikaria in 1525 and the rest islands in between 1537 and 1669. Finally, original charting mainly with features of improvement, but some times schematization as well, are met in the charts of Rhodes, Sikinos, Pholegandros, Telos, Nisyros, Anafi, Santorini, Symi, Halki, Delos, Naxos, Caros, Ios, Amorgos, Zinara-Levitha, Leros, Patmos, Samos, Psara, Lesbos and Tenedos (Bozcaada). Tenedos was already conquered by Mehmed II, while Lesbos became Ottoman in 1462, Samos in 1479, and the islands of Delos, Caros, Samos and Psara appear to be uninhabited at that time. The rest of the islands were conquered between 1522 and 1537 with the exception of Santorini in 1579.

The text of the Italian isolari is written either in Latin or Italian. The use of lingua franca by Pīrī Re’īs and his contact with European mariners in the sea, does not indicate his knowledge of those languages as well, nevertheless, it does not

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<sup>159</sup> I follow the order of the printed Sonetti.

exclude an acquaintance of limited scale with them. Additionally, it is not impossible that these texts were results of booty or purchase and were read to Pīrī Re'īs by captives, converts or interpreters. The acquisition could also be done through official ways, such as state or atelier<sup>160</sup> order through the Venetian bailo or merchants.

In his text Pīrī Re'īs makes references to “old stories” or “old narratives,”<sup>161</sup> which cite mythological or historical elements.<sup>162</sup> They are mostly rich and

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<sup>160</sup> Evliyā Çelebi described the Galata mapmaking ateliers: “Eşnâf-ı hârtacıyân: Nefer 15 ve dekâkin sekiz bu tâ'ife cemi'ci 'ulüm-ı ğaribe ve 'acibeye mâliklerdir ve bir kaç lisâna mâliklerdir cümleden lisân-ı Latîni Eflatîne mâliklerdir kim selef hükemâlarına 'ilm-i hey'et üzere te'lifâtlarında *Kitâb-ı Atlas* ve *Minor* ve *Cogrâfiye* ve *Yapamonta* mişilli kitâbları okıyup cemi'ci rüy-i zemînde olan Çaradeñizi ve Akdeñizi ve Baħr-ı Muħiṭi ve Baħr-ı Okyanüsü ve Baħr-ı 'Ummânî ve Baħr-ı Süveysi ve Baħr-ı Hazeri ya'ni Giylân Deñizi {ve Baħr-ı 'Ummânî} ve Baħr-ı Hümmüzi ve Halic-i Bundukânî ve Baħr-ı Vanî ve'l-hâşıl cümle ebħurleri ve ğalicieleri ve tur'aları ve bu deryâlarda maħlûṭ olan nehr-i 'azîmleri ve rüy-i arzda olan dağ ve taşları cümle taşvîre getirüp hey'etle yazup gemicilere fûrûḥt ederler kim cemi'ci keşṭibânlarıñ bu 'ilm-i hârtâ cânlarıdır. Zîrâ sekiz rûzgâr ve yetmiş kerte üzere ne diyâra gidecegin ve ne cezîreye uğrayup ol limana ğarib sig-mudur ve dökündüli taşluk-mu ve ğumsal-mı ve 'amîk-mi ve a'la yatağ liman-mıdır? Cümle bu hârtalarda mastûr olup re'isler bu hârtılar ile 'amel edüp Baħr-ı 'Ummânda mellâhlık ederler, 'ilm-i azîmdir. (...) Netice-i merâm bu hârtacı ğavmi 'arabalar üzere dükkânların hârtâ kağızları ile dünyâ taşvîri taħrîr olmuş ve niçe kıla' ve şehirler şüretleriyle dükkânların zeyn edüp kendüleri daħı vağa' u vağârlarıyla 'ubûr ederler (Guild of mapmakers: Their class comprises eight workshops and 15 artisans, who know every occult and strange science. They know many languages, mainly Latin and the similar ones and read books like Atlas Minor, Geography and Mappamundi, works of elder wise men dealing with cosmography. They draw and measure whatever is on the surface of the earth: the Black Sea, the Mediterranean, the Oceans, the Sea of Oman, the Sea of Suez, the Caspian Sea or Sea of Gilan, the Sea of Ormuz, the Venice Gulf and the Van Lake; every sea, gulf and strait, every big river and rocks. Then they sell them to the mariners. For every seaman, those are the soul of the science of cartography. If there are reefs or precipitated rocks, deep or shallow waters near the land or the island they go, if there is a natural port, they draw it out on the eight winds and the seventy (sic) kertes. Captains who are experienced in these charts, use them to travel and cross the Sea of Oman. It is a great science. (...) Finally, [during the guild parade] these cartographers march past with pomp on carriages, carrying their products: charts, world images drawn by them and representations of many castles and cities that decorate their workshops.)” See Evliyā Çelebi *Seyâhatnâmesi* (TSMK, Bağdat 304, f. 163a).

<sup>161</sup> “Muħaddişân-ı ğavâdis-i rûzigârdan,” or “muħħabirân-ı aħbâr-ı rûzigârdan,” or “tevârîḥ-i ğadîm.” See, MS. Ayasofya, ff. 47b, 60a, 133b, 136b, 137b.

analyzed references from the Greek Roman world mentioned by Buondelmonti and are adapted by Pīrī Re'īs.

Another common feature is the order<sup>163</sup> of the chapters of the Cycladic islands, which Pīrī Re'īs divides into two groups. The first group starts with Pholegandros and ends with Kea, while the second starts from Naxos and ends with Andros, a feature that appears in the Italian isolari with the opposite order.<sup>164</sup>

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<sup>162</sup> Those short references may be found in both the Buondelmonti and Sonetti texts in the chapters on Imbros, Euboia, Naxos, Tenos, Andros, Corfu, Crete, and Serifos.

The chapter on Tenos (İstindin) in f. 136b starts like this: “Muhaddisān-ı havādis-i rūzigārdan işbu cezīrenüñ hakkında şöyle rivāyet olmur ki, İskender-i Zū'l-karneyn zamānundan evvel cezīre-i mezbūr ma'mūr imiş. Ve andan sonra Efrenc memleketinden bir pādīshāh deryā yüzinden gemiler ile 'asker gönderüb mezkūr adayı gāret edüb harāb eder. Hāliyā müddet-i rūzigār ile Niķōlāvīn dērler imiş bir beg gelür, mezkūr adayı ma'mūr edüb bir kal'e binā eder, Şimdiki hālde mezkūr kal'e Venedike tābi'dür (The old stories relate such an event about this island, which was very prosperous before the time of Alexander the Great. Later on a king from the Frankish countries came with his ships, brought his army, plundered the island and ruined it. After a long time a lord named Nikolavin came, constructed the island again and had a castle built. Now this castle belongs to Venice).”

This is how the story is mentioned in Buondelmonti: “Et cives effecti divites, tempore Alexandri clauere, postea a Romanis in exterminium devenerunt.” See *Christophori Bondelmontii Florentini Librum Insularum Archipelagi*, edited by G.R.L. de Sinner (Lipsiae et Berolini: G. Reimer, 1824), 89. See, also, Christoforus Buondelmonti, *Liber Insularum Archipelagi*, Athens, Gennadeios Library, MS. 711, f. 19r.

Sonetti mentions the following: “Sopra l'un di duo monti e il castel po / e in mezzo una gran vale fruttuosa / che al tempo de Alexandro fu famosa / e de Romani quasi la ruino.” See, printes Sonetti, chapter on Tenos.

<sup>163</sup> This order does not seem to adjust with the sea routes of the region presented in ΜΠΕΛΑΒΙΛΑΣ, Νίκος. *Λιμάνια και οικισμοί στο Αρχιπέλαγος της πειρατείας, 15<sup>ος</sup>-19<sup>ος</sup> αι.* (Αθήνα: Οδυσσέας, 1997), 51-64.

<sup>164</sup> It is noticeable that the similarities between *Bahriyye* and the Greek portolan-texts appear in the region of the Cycladic islands (esp. the chapters on Melos and Cythnos). We may observe that the first group of islands belong to Venice, an element always mentioned in the Pīrī Re'īs text. These are the islands of Amorgos, -Caros seems to be uninhabited-, Naxos, Paros, Syros, - in the chapter on Delos there is a reference from the Islamic world-, Myconos, Tenos, Andros. In this groups apart from the same order of the chapters, there are no common elements with the texts of the Italian and Greek portolans. From the Greek region of the Mediterranean, also, Aigina, Damala, Monemvasia, Cythera, Zakynthos, Cefalonia, Parga and Paxoi are Venetian colonies. Nevertheless, there no text similarities in these chapters as well. Pīrī Re'īs must have

In all other parts the order of the islands is not similar. Bordone had his own order, while Buondelmonti and Sonetti followed a route from west to east, and Pīri Re'īs exactly the opposite.

BUONDELMONTI, 1420 <sup>165</sup>	SONETTI, ca. 1485 <sup>166</sup>	PĪRĪ RE 'ĪS, 1526 <sup>167</sup>
...	...	...
Creta	Candia	Telos
Carpathus	Scarpanto	Nisyros
Rhodes	Rodi	Levitha
Simiae	Sicandro, Policandro	Amorgos
Caristos	Piscopia	Caros
Dilusanos	Nisari	<b>Naxos</b>
Caria	Stampalia	<b>Paros</b>
Astimphalea	Conupi, et al.	<b>Syros</b>
Aegasa	Namphio	<b>Delos</b>
<i>Sicandros</i> <sup>168</sup>	Santa Erini	<b>Mykonos</b>
<i>Policandro</i>	Simie	<b>Tenos</b>
<i>Polimio</i>	Carchi, Limonia	<b>Andros<sup>169</sup></b>
<i>Milos</i>	<i>Milo</i>	Attica
<i>Siphanos</i>	<i>Siphano</i>	...
<i>Serfinos</i>	<i>Serphino</i>	Carpathos
<i>Thermia</i>	<i>Fermentia</i>	Crete
<i>Cea</i>	<i>Zea</i>	Anafi
<b>Andros</b>	<b>Andre</b>	Santorini
<b>Caloieros</b>	<b>Tine</b>	Ios
<b>Tino</b>	<b>Micone</b>	<i>Pholegandros, Sikinós,</i>
		<i>Kimolos</i>
<b>Mykonos</b>	<b>Sdiles</b>	<i>Melos</i>
<b>Delos</b>	<b>Suda</b>	<i>Siphnos</i>
<b>Suda</b>	<b>Pario</b>	<i>Seriphos</i>

concentrated himself in the cartographic part of the Sonetti isolario, since for an Ottoman subject and captain on board, it must have not been easy to conduct observation around a Venetian territory.

<sup>165</sup> The edition of Sinner is used here.

<sup>166</sup> The printed Sonetti is used here.

<sup>167</sup> The MS. Ayasofya is used here.

<sup>168</sup> The chapters in black letters are the first group, while those in both black and Italic letters are the second.

<sup>169</sup> The group of these seven islands has the same order in the first version of *Bahriyye*, while the second group is as: Carpathos, Crete, Astypalaia, Anafi, Santorini, Pholegandros, Cythnos, Siphnos, Serifos, Melos, Cea... See, the Kahle edition, p. xlvii-xlviii.

**Paros**  
**Antiparos**  
**Panaya**  
**Naxos**  
 Podia  
 Raclea  
 Chiro  
 Nio  
 Anafios  
 Buport  
 Chinera  
 Levata  
 Caloieros  
 Choa  
 Claros  
 Herro  
 Pathmos  
 ...

**Nicsia**  
 Pira, Chiero, Raclia  
 Nio  
 Amorgo  
 Zinara, Levita  
 Caloiero  
 ...

**Cythnos**  
**Cea**  
 Scyros  
 Sciathos  
 Scopelos  
 Alonessos  
 Peristera  
 Kyra Panagia  
 ...

In sum, Pīrī Re'īs used the Sonetti book, and not the Buondelmonti book directly, in order to copy the charts. To this he added his personal observations, which led him to a more accurate result.

The chapter on Cyprus, if the introductory information of the first paragraph are excluded, displays a significant similarity with the Greek Portolan I, as was published by Delatte.<sup>170</sup> Pīrī Re'īs followed exactly the row of the Greek text, which may be realized from the rendition of the Greek place names.

*Moulia*, which in the Greek printed portolan of Tagias (version *t* according to Delatte) are mentioned as *Moulina* –while in the manuscript versions they are *Moulia*- in Pīrī Re'īs's text become *Muline*. *Miamou* is read *Muya Muza* and *Muyamu* by Pīrī Re'īs, because this is how he read (?) or heard the reading of Greek text, where the place name is mentioned for the first time in its genitive form,

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<sup>170</sup> DELATTE, *op. cit.*, 1:118-130.



*Miamous*, while repeated a second time as *Miamou(n)* in accusative form respectively. Thus, the place name appears in *Bahriyye* in two forms. These readings are met in the manuscripts V,<sup>171</sup> P<sup>172</sup> and the printed version t<sup>173</sup> of the Greek portolans.

On the other side Famagusta, which in *Pīrī Re'īs* is a separate paragraph at the end of the chapter, is not found in most of the manuscripts, but met again as a last part of the Cyprus chapter in the manuscript P and the printed version t. *Pīrī Re'īs* makes shorter that long reference at the end of the chapter, while the description on Kyrenia until just before the promontory of Santofan (Arnaoutis) is moved to the beginning, as it was a more logical choice for someone who mainly comes to Cyprus from Istanbul or the North.

We come to the conclusion that *Pīrī Re'īs* must have had in hand<sup>174</sup> the Greek text of Portolan I, and more precisely, one that was closer to the manuscript P and the printed version t, or its manuscript source.<sup>175</sup> The manuscript P copies a

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<sup>171</sup> MS. Vindobonensis history. gr. 82. See, DELATTE, I: x-xi.

<sup>172</sup> MS. Parisinus gr. 1416. See, DELATTE, I: xv-xvi.

<sup>173</sup> Printed portolan of Tagias, Venice 1573. See, DELATTE, I: xvi-xviii.

<sup>174</sup> Soucek thinks that there must have been in circulation among mariners short booklets or brochures or even single folios with sailing directions for a certain region. Those booklet had lesser chances to be preserved. Such an interpretation may provide us with a sufficient explanation for the case of the similarity of the chapter on Cyprus among the Greek portolans and *Bahriyye*. See SOUCEK, Svat. "Tunisia in the *Kitab-i Bahriye* by Piri Reis." *Archivum Ottomanicum* 5 (1973): 289.

<sup>175</sup> All other manuscripts of the Greek portolans (including the Codex Leidensis, Vossianus graecus O. 12) has lesser similarities with *Bahriyye*.

text of the 15<sup>th</sup> century,<sup>176</sup> thus it is earlier than *Bahriyye*, while the printed version of Tagias (1573) was based on a manuscript, which its publisher found in 1559.<sup>177</sup> We do not know the exact date of that manuscript, which could be earlier than *Bahriyye*, therefore its source.

The relation of *Bahriyye* and the Greek portolan-texts was discussed by Svoronos in 1949.<sup>178</sup> Svoronos found that the chapters on Mykonos had possibly a common Italian source, a proposal that Delatte denied in 1958. Makrymichalos<sup>179</sup> and Soliotis<sup>180</sup> dealt with the issue in 1963 and 1984 respectively. In general Pīrī Re'īs's text is richer in information, than the Greek portolans, which consist of strictly sailing directions, without any other supplementary element.

As far as the order of the chapters is concerned, the Cycladic islands that are given in two groups by Pīrī Re'īs, follow, especially the second group, the same order found in the Portolan I.<sup>181</sup>

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<sup>176</sup> See DELATTE, I: xv.

<sup>177</sup> See DELATTE, I: xvii.

<sup>178</sup> SVORONOS, N. "Portulans grecs." *Revue des Etudes Grecques* 62 (1949): 237-240.

<sup>179</sup> ΜΑΚΡΥΜΙΧΑΛΟΣ, Στέφανος Ι. "Έλληνικοί πορτολάνοι του 16<sup>ου</sup>, 17<sup>ου</sup> και 18<sup>ου</sup> αιώνας." *Ερανιστής* 1 (1963): 154-155 & 219-220.

<sup>180</sup> ΣΟΛΙΩΤΗΣ, Χ. *Ο πορτολάνος της Ζαγοράς. Χειρόγραφο του XVI αιώνα (Θεσσαλική Βιβλιοθήκη αριθ. 46)*, (Αθήνα: χ.ε., 1984), 46 ff.

<sup>181</sup> The same order is followed from Sikinos to Cea by the anonymous Greek translation of Buondelmontri preserved in the Topkapı collection. The rest of the text does not show any similarity neither with the Greek portolans nor with *Bahriyye*.

Carpathos  
 Anafi  
 Santorini  
 Tilos, Nisyros  
 Astypalaia  
 Amorgos  
**Ios**  
**Sikinos**  
**Pholegandros, Kimolos**  
**Melos**  
**Siphnos**  
**Seriphos**  
**Cythnos**  
**Cea**  
 Syros  
 Delos  
 Chios  
 Andros  
 Tenos  
 Mykonos  
 Naxos  
 Paros

Carpathos (2<sup>nd</sup> group)  
 Crete  
 Anafi  
 Santorini  
**Ios**  
**Pholegandros, Sikinos, Kimolos**  
**Melos**  
**Siphnos**  
**Serifos**  
**Cythnos**  
**Cea**  
 Tilos (1<sup>st</sup> group)  
 Nisyros  
 Levitha  
 Amorgos  
 Caros  
 Naxos  
 Paros  
 Syros  
 Delos  
 Myconos  
 Tenos  
 Andros

In all other places the row is opposite and place names do not follow the same order. For instance, the chapter on Crete in the Greek Portolan I begins from the promontory Solomon at the North-eastern edge and goes from the east to the west, while PĪrĪ Re'Īs starts from Kandiye with the same direction using, though, a different density of place names. There are only two passages of the texts where a general similarity may be traces, the chapters on Melos and Cythnos.

The Book on Navigation is earlier than the preserved Greek portolans, the oldest of which is dated 1534.<sup>182</sup> In that manuscript there is the following note (f. 105v and 118r): “Ἐγὼ Στεφανῆς Τουρκὺς ἐγραψα – Io Stefani Turhi ho scritto (I, Stephanis Tourkis wrote).”<sup>183</sup> The nickname *τουρκὺς* or better *Τουρκῆς* (meaning Turk) could raise certain ideas for the scribe’s relations with the Ottomans, at least for a possible knowledge of Turkish language, and lead to a further affiliation with the work of Pīrī Re’īs.<sup>184</sup> The sources available cannot, though, support such a hypothesis.

If now, according to the aforementioned similarities we attempted to put the one or the other text in the position of the source, comes out the question why the common features are restricted in two brief passages and the chapter on Cyprus. We saw before that the differences of the two texts do not allow stable direct parallelisms, apart from that they deal with the same subject, the charting of the same area, where the alternatives in the recording process could be then a priori developed under limits.

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<sup>182</sup> Anonymous, [*Greek portolanos*], Athens, Library of the Greek Parliament, MS. 108.

<sup>183</sup> See ΤΣΕΛΙΚΑΣ, Αγαμέμνων, et alii (εκδ). *Δύο χειρόγραφοι ελληνικοί πορτολάνοι. Οι κώδικες της Βιβλιοθήκης της Βουλῆς και της Δημόσιας Βιβλιοθήκης Ζαγοράς* (Αθήνα: Μορφωτικό Ίδρυμα της Εθνικῆς Τραπέζης, 2003), 32 & 36. Tselikas thinks that the note was written by a later owner of the book in 17th century from the family of mariners called Tourkis and originated from Crete.

<sup>184</sup> The case that the Greek portolans are based on the Ottoman Pīrī Re’īs text is a less stable theory. Could a mariner, who knew the Ottoman language restrict himself in the use of the text, without copying the attractive charts? How could a mariner again react against the rich information given and choose only the strictly sailing directions? Finally, why should he copy descriptions of islands under Venetians, where he could easily moor or sail around? He had no reason to reproduce information from someone, who could not even reach the region.

In conclusion, we may propose that *Pirī Re'īs* is related to the Greek portolan-texts, if not directly to the known preserved manuscripts, therefore to an older one. The possibility of a common Italian source from which the authors of the Greek portolans profited a lot, while *Pirī Re'īs* found himself more selective should not be excluded. A further correlation would not be more secure.



## 5.2 Hācı Muḥammed Re'īs, *Tuḥfetü'l-esrār fī tarīķi'l-bihār*

The dominant figure of Pīrī Re'īs during the 16<sup>th</sup> century seems to not have allowed other sailing-directions texts to appear in numbers, since the *Book on Navigation* served the mariners' need in full. Pīrī Re'īs was decapitated in 1553-1554. His work was constantly being copied and adapted by each scribe or seaman, who added his own experience on the charts. The text remained intact, while the charts could accept more place names, together with short notes that warned the mariners about reefs, wracks that previously took place in a certain spot, potable water on the land, etc. Thus, we can say that each mariner made his own additions and adaptations of the charts, to finally result in a copy of the *Book* that varied from other copies.

Towards the last decade of the 16<sup>th</sup> century the name of Hācı Muḥammed Re'īs appears on three copies of a work under the title *Tuḥfetü'l-esrār fī tarīķi'l-bihār*.<sup>185</sup>

The oldest of the three extant copies is nowadays preserved in Istanbul, in Süleymaniye Library (MS Esad Efendi 3782/35). It is written in *nesih* script

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<sup>185</sup> The work is described with many inaccuracies in İHSANOĞLU, Ekmeleddin (ed.). *Osmanlı coğrafya literatürü tarihi*, 2 vols. (İstanbul: IRCICA, 2000), 1: 71-72.

without vocalization and covers the folios 94b-96b of the codex. The dimensions of the page are 29 x 16,5 cm and those of the text 26 x 14 cm, while there are 45 lines per page. The paper is greenish and thick, opaque, without watermark. The ink is black, while highlighted words, such as the first word of the references (*ba'dehu*), names of ports, or numbers of miles are written in red ink. It bears the date of copying on a marginal note on f. 96b as 30 Rebü'l-evvel 1005, that is 21 November 1596. The scribe is Ya'küb el-[İskilibi?].

The second copy belongs to the Istanbul Süleymaniye Library (MS. Fatih 5427) ff. 240b-244a. It is written in *talik* script, the dimensions of the page are 29,5 x 20 cm, while those of the written text are 21,5 x 11,5 cm. There are 22 lines per page. The paper is glairy white. The blank ink is interrupted by the beginning word (*ba'dehu*) of each distance measuring and a few numbers of miles in red. On the first folio of the codex there is a contents' list, where the text is mentioned with the title "*Beyân-ı emyâl-i Baħr Ebyaz.*" At the end, the date of copying is given as Şa'ban 1044 (20 January to 17 February 1635).

The third copy is preserved in the Bodleian Library in Oxford. It belongs to the collection Pococke and bears the number 15. It consists of 28 folios, each of them contains 11 lines of text. It has an illuminated frontispiece. The text is written in large and clear *nesih* script with vocalization. The dimensions of the page are 18,4 x 11,1 cm. The blank ink is interrupted by the beginning word (*ba'dehu*) of each distance measuring in red. On f. 1a there is an entry dated 21 Cemâzîe'l-ülâ 1049 (19 September 1639), thus this should be accepted as a *terminus ante quem* in

order to date the manuscript. The title of the booklet appears on the same folio as *Risāle-i Tuḥfetü'l-esrār fî tarîķi'l-bihār*.<sup>186</sup>

This work is a pure sailing-directions text of the sort of *traverso*, or portolan of the distances. A brief introduction provides us with the name of the author, the content of the treatise in short and the reason why the author decided to compose it:

“Ammā ba‘dehu faķîr ü ḥaķîr ü pürtaķşîr Ḥācî<sup>187</sup> Muḥammed Re’îs deryâ ehline lâzîm olan ve isti‘māl olunan ḥarṭınuñ tarîķlerini tâ Kōstantîniyyeden Sebte boğazına varınca taķsîm ve tevzî’ /f. 2a/ èdüp ehl-i deryâ olan ḳardeşlere āsân olmaķ için bu risāle birle ‘amel èdüp ḥîn-i maḥalde ḥariṭa ihtiyāc olunmıya bu risāle mücebince ‘amel èdüp tarîķlerine dāḥîl olup Ḥācî Muḥammed Re’îs ḥaķîri du‘ādan ferāmüş itmeyeler.”<sup>188</sup>

The author comes from the people of the sea (“... ehl-i deryâ olan ḳardeşlere ...”) as he says. We may deduct this from his title “re’îs” too. Another important element in this introduction is the reference to the use of charts by the Ottoman mariners, whom Ḥācî Muḥammed Re’îs wants to assist in their work on

<sup>186</sup> The manuscript is described in the catalogue of the Bodleian Library oriental manuscripts by SACHAU & ETHÉ: col. 1181.

<sup>187</sup> “El-Ḥāc” in the Süleymaniye Library, Esad Efendi 3782/35 copy, f. 94b.

<sup>188</sup> From the copy in Bodleian Library, Pococke 15, ff. 1b-2a.



board. His manual may be used by those who do not wish to use a portolan-chart as well. This information makes clear that the portolan-text was considered by sea pilots an easier and quicker instrument to use in place of the chart or makes the charts reading and understanding more convenient. The author presents the work as his own and not as a copy, adaptation or translation. The title *Ḥācī* lets us know that he must have committed at least once the visit and pilgrimage to the holy cities of Islam. Ḥācī Muḥammed Re'īs is an almost anonymous eponymous nautical author. There is no additional information apart from this short introduction.

There is a portolan-chart of the Aegean Sea, which is dated in around the same time, that is the year 999 (1590-1591). It bears the following note:

“Amal-i Muḥammed Re'īs ibn Menemenli, sene 999.”

The chart is designed on skin, has dimensions of 59.2 x 82.5 cm and is preserved in the Museum Civico Correr in Venice (Nr. Port. 22). The orientation of the chart is with the south on the top, a common feature in the Islamic cartography. The coastline is colored blue, while the islands are green, red and golden. It is relatively poor in place names; only around two hundreds appear on the chart. The toponymy presents higher density over the Albanian coasts. This gives a hint that the author was originally from that area or spent a certain period of time there, so that he became acquainted with the region. On the map there is also a note in Latin, which is a translation of the above mentioned original note in Ottoman: “Fatta da

Muhammed Rais (capitano) figlio di Monmanli l'anno dell'Egira 999 di G. C. 1590." Scholars who have studied the chart think that it fell to Venetian hands during the conflicts on the Adriatic in 1600-1610. Then the chart entered the Venetian archive and somebody wrote the note in Latin.<sup>189</sup>

Among the very few names of *reis*'es that have produced works of nautical interest, it is possible that Ḥācī Muḥammed Re'īs and Muḥammed Re'īs ibn Menemenli are one and the same person, nevertheless I have not enough evidence to support this argument.

The text begins with the distance from Istanbul to Marmara Island, then goes through the islands of the Eastern Aegean, the Cycladic Islands, the Dodecanese, Crete, Rhodes, Cyprus, Tripolis of Lebanon, then back to Northern Aegean Islands, the Western Aegean coast, Euboia, Athens, around the Peloponnesus, the Ionian Seven Islands, the Albanian and Illyrian Adriatic coast, Venice, the Italian coast from the east to the west, Sicily, Malta, Napoli, Rome, Genoa, Marseille, Barcelona to Gibraltar. Then it goes back to Dardanelles and follows the Asia Minor coast to the south through Edremit, Mytilene, Foça, Chios, Samos, Muğla, Makri, Kekova, Antalya, Alanya, Silifke, İskenderun, Beirut,

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<sup>189</sup> For the Menemenli chart see VEDOVATO, M. "The nautical chart of Mohammed Raus, 1590." *Imago Mundi* 8 (1951): 49. BRICE, William, Colin Imber, and Richard Lorch. *The Aegean sea-chart of Mehmed Reis Ibn Menemenli A.D. 1590/1*, Seminar on early Islamic science, Monograph No. 2 (Manchester: University of Manchester, 1977). HARLEY, J. B., and David Woodward (eds). *The History of Cartography*, volume two, book one, *Cartography in the traditional Islamic and South Asia societies* (Chicago: Chicago University Press, 1992), 282-284. ΛΟΥΠΗΣ, Δημήτρης. *Ο Πιρι Ρεϊς (1465-1553) χαρτογραφεί το Αιγαίο. Η Οθωμανική χαρτογραφία και η λίμνη του Αιγαίου* (Αθήνα: Τροχαλία, 1999), 148-149. İHSANOĞLU, Ekmeleddin (ed.). *Osmanlı coğrafya literatürü tarihi*, 2 vols. (İstanbul: IRCICA, 2000), 1: 74-75.

Damietta, Alexandria, Tomruk, Shabaka, Maghreb, Sfax, Tunus, Algeria to be completed in Gibraltar. This is the row of the Bodleian copy, which seems to be finished properly with the word “temme.” But the other two copies have a separate chapter at the end that deals with the Black Sea ports, such as Amasra, Sinop, Samsun, Giresun, Trabzon, Rize, Batum, Sochum, Kefe, Ozi, Akkerman, Varna, Sozopolis, etc. This chapter is in folio 96b of the Esad Efendi copy and folios 243b-244a of the Fatih collection copy.

It seems that all three copies do not follow the same manuscript tradition, while the Esad Efendi and Fatih copies belong to the same branch of tradition with some minor differences among them. None of these two copies was used on board. The Esad Efendi and Fatih texts are included in codices with a variety of texts, therefore, the text they provide was copied by another source, which possibly could be a separate booklet (*risale*). The text in a form of *risale* could more easily be used by mariners as a manual. This is the form in which the Bodleian copy is preserved. The results of humidity affected badly the spine parts of the folios at the end of the booklet. There is consequently a possibility that this certain booklet was used on board. In this case it was reproduced in order to be used in the Mediterranean by a pilot, who was not sailing in the Black Sea, since it lacks that chapter.

On the issue of the originality of Ḥācī Muḥammed Re’īs’s text, it seems that he does not have any direct relation to the Italian texts published by Kretschmer, Motzo and Asole, or the Greek portolans of the 16<sup>th</sup> century, which were edited by

Delatte. No other *traverso* portolan in any Mediterranean language studied here was the basis of this text in any means. Additionally, the place names that Ḥācī Muḥammed Re'īs uses are exact Ottoman versions of non-Ottoman toponymy, without any, Italian for instance, intermediary like in the case of the Greek portolans, which are abundant in Italian and Venetian terminology, even in the way Greek place names are pronounced.



### 5.3 The Anonymous *Borgian Portolans*

While making a research on Ottoman nautical cartography in Italian libraries and archives, I found almost unexpectedly a booklet with nautical instructions in Ottoman language, although international bibliography considers *Kitāb-ı Bahriyye* by Pīrī Re'īs the only Turkish portolan text.<sup>190</sup> This booklet belongs to the Biblioteca Apostolica Vaticana in Rome and is catalogued as Borgiano Turco 72.<sup>191</sup> It is a paper codex covered with cardboard. Its dimensions are 22 X 16 cm. It consists of 36 folios written in *nesih* script. The place names are written in red ink. It bears no author or scribe's name, nor date of compilation. It consists of:

- folios 1b-3a List of contents of the portolan text of the Aegean Sea.

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<sup>190</sup> LOUPIS, Dimitris. "An Unpublished Anonymous Ottoman Portolan Text that ignores Pīrī Re'īs." In *CIÉPO XIV. Sempozyumu bildirileri, 18-22 Eylül 2000, Çeşme*, yay. Tuncer Baykara (Ankara: Türk Tarih Kurumu, 2004), 453-463. In Turkish translation: LOUPIS, Dimitris. "Piri Reis'i yok sayan bir Osmanlı portolan metni." *Kebikeç, İnsan Bilimleri için Kaynak Araştırmaları Dergisi* (Ankara) 16 (2003): 461-470.

<sup>191</sup> Catalogued in Ettore Rossi, *Elenco dei manoscritti turchi della Biblioteca Vaticana* (Vaticano: Biblioteca Apostolica Vaticana, 1953), 360. Svat Soucek erroneously considers it a chart or an atlas. See S. Soucek, *loc. cit.*, 289.

- ff. 3b-4a Short description of the manuscript in Italian.
- ff. 4b-5a Blank folios.
- ff. 5b-30b Portolan text of the Aegean Sea (*Borgian Portolan I*).
- ff. 30b-34a Incomplete distance portolan (*traverso*) of Mediterranean islands and ports (*Borgian Portolan II*).
- ff. 34b-36a Blank folios.
- f. 36b Short note with technical instructions on how a galleon enters and leaves a port.

The list of contents is fully covered in the nautical instructions text, which reminds of the Italian and Greek portolan texts of the 15<sup>th</sup> and 16<sup>th</sup> centuries. The plain and simple instructions for little and big galleons are not interrupted by historical and mythical narrations such as those found in the *Kitāb-ı Bahriyye*. The language and style of the author is simple and naïve, a feature that is characteristic of the portolans of the era that are compiled by common sailors to support them in their work.

The *Borgian Portolan I* begins as (ff. 5b-6a):

حالا بحر سفیدده اولان جزیره لرك لیمانلری بیاننده در. مانیه بورننه درت میل  
 مقداری قریب بر لیمان وارد. ادینه پورتو قالیه دیرلر. ایچرو گرمک اقتضا ایدر ایسه،  
 لیمانی بلمک ایچون بر قرمزی بورون وار. اول محله طوغری وارهن سن و اول محله مرور

ایلد کده بر انجه برون وار. مقدم قرمزی برونی قابیونک اسکله طرفنه و صگره کی انجه  
برونی سنجاق طرفنه قالدقده ایکیسنگ اورطهسنه گیدر ایکن صاغ طرفنده بر اسکی  
قلعه واردر. دآتما انجه برونن طرفه گیدیلور، زیرا لیمانک اورطهسنده بر صیغی واردر.  
اوزرنده اون بش قارش صوی واردر. انجه برونن گجد کده همان تیمور براغهلو  
طشرسنده پلمار بعلنور داخی ایچرویه گیرمگه طمع ایلمیه لر. ذیرا ایچروسی صغدر  
و بوغاز آغزنده گجد کده ایکی طرفندن گجیلور.

“This is to describe the ports of the islands of the Mediterranean Sea. Close to the cape of Manya and four miles away there is a port. It is called Porto Kalya [Porto Kayo]. If it is necessary to enter the port so that they know it better, there is a red cape. Sail towards the cape and when you pass by it, there is a thin cape. While sailing between the two capes, that is when the red cape is at the left of the galleon and the thin cape at the right, there is an old castle. They should keep on towards the thin cape, because there is a reef in the middle of the port. The water is fifteen spans over the reef. Immediately after they pass by the thin cape, they should tie the ropes away of the huts, where they usually drop anchor, and not try to enter more close. Because closer there is a shoal and, when they pass the entrance of the straits, they advance sideways.”

The portolan begins the reference from the southeastern edge of Peloponnessus and the port of Porto Kayo, to continue to Saronicos Bay, North Aegean Islands, the Cyclades, the Dodecanese, the remaining Cyclades, the island of Crete, while the last ten references are placed disorderly dealing with the islands of Psara, Syme, Lesbos, Andros, Tenos, Saint Stratis and Saint Kharalambous Bay in Lemnos (Kilisecik limanı). The portolan is here completed.

The *Borgian Portolan II* is a traverso that gives the distances between islands and ports of the Eastern Mediterranean. This portolan is incomplete. It is divided into 37 groups, each of which gives the distance in miles and the orientation of five destinations from a certain island or port. The last groups do not follow this order.

The first group is:

	میل عدد
بوغازدن بوزجه اطه اوگی لیمانه قبله لودوسه دوشر.	۰۱۸
بوزجه اطه دن بابا بورننه قبله نك بر بچوق کرتھ لودوس طرفنه.	۰۴۰
بوزجه اطه دن بوز بابا باطی نك بر کرتھ لودوس طرفنه دوشر.	۰۴۶
بوزجه اطه دن اشکیروزه قبله بورننه لودوسك بر کرتھ باطی طرفنه.	۱۲۰
بوزجه اطه دن اندره بوغازی لودوسه دوشر.	۱۶۰



“Number of miles

- 018 The entrance of the port of Bozca Ada is S-SW of the Straits.  
040 From Bozca Ada to Baba Cape it is one and a half kerte<sup>192</sup> S to SW.  
046 From Bozca Ada to Ay-Stratis it is a kerte W to SW.  
120 From Bozca Ada to the southern cape of Skyros it is one kerte SW to W.  
160 The Andros Island straits are at the S of Bozca Ada”

The anonymous *Borgian Portolans I and II* have no relation with the *Kitāb-ı Bahriyye* by Pīrī Re’īs, which they seem to ignore. They carry strictly nautical instructions without any digression of historical, folklore and mythological interest. The anonymous author does not make use of *Kitāb-ı Bahriyye*. His text leaves *Kitāb-ı Bahriyye* behind in the past. Actually Pīrī Re’īs’s work belongs to the technology of the past. The Borgian text is a new nautical handbook of the Aegean.<sup>193</sup> Its author seems not only to ignore previous portolan texts, but also contemporary French and English pilots. The study of the Western European nautical technology and handbooks, and of the Ottoman response during the 19<sup>th</sup> century will shed light on the issues concerning the Borgian Portolans and help in finding out their relation to other nautical works. The research up to now reveals a

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<sup>192</sup> For *kerte*, a rhumb of the mariner’s compass, see Henry & Renée Kahane and Andres Tietze, *The Lingua Franca in the Levant. Turkish nautical Terms of Italian and Greek Origin* (Istanbul: ABC Kitabevi, 1988), 366-7. As for the number of kertes, they are always divided by four, so seventy two is the right number instead of seventy.

<sup>193</sup> For sea routes in the Aegean Sea see John H. Pryor, *loc. cit.*, 97-9.

text that has no relation to the Latin and Italian portolans from 1200 to 1650,<sup>194</sup> the Greek manuscript portolans of the 16<sup>th</sup> century and the Tagias printed portolan till 1800,<sup>195</sup> also the *English Pilot* (1771),<sup>196</sup> the French portolan by Henry Michelot (1805),<sup>197</sup> the English one by John Stewards (1826)<sup>198</sup> and that by J.W. Norie, L.

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<sup>194</sup> It has no relation with the following texts:

Patrick Gautier Dalché, *Carte marine et portulan au XIIe siècle. Le Liber de Existencia Riveriarum et Forma Maris Nostri Mediterranei* (Pise, circa 1200), (Rome: École Française de Rome, 1995). [ca. 1200]

Konrad Kretschmer, *Die italienischen Portolane des Mittelalters: Ein Beitrag zur Geschichte der Kartographie und Nautik*. Veröffentlichungen des Instituts für Meereskunde und des Geographischen Instituts an der Universität Berlin, vol. 13 (Berlin, 1909; reprinted Hildesheim: Georg Olms, 1962). [14th to 16th centuries]

*Opera Nova chiamata portolano laqual narra tutte le terre: & porti de leuante cominciando a Venetia andando per tutta la Schiaunonia fin a Corfu con tutta la Grecia la Morea & Napoli de Romania con tutto Larchipelago: Constantinopoli Candia Rodi Cipro & tutto il Leuante & tutte le isole: terre citta e castelli & porti & quanti miglia da una terra a laltra & da una isola a laltra: & tutte starie porti valle e colphi: scagni: fondi: e sechi dintorno. Novamente stampato* (Vineggia: Domenego Zio & Fratelli Veneti, s. d. [ca.1518]).

*Nuovo Portolano non piv stampato molto particolare de'l Levante a de'l Ponente* (Vineggia: Pavlo Gerardo, 1544).

<sup>195</sup> Demetrios Tagias (ed.), *Πορτολάνοϛ [Portolanos]* (In Venetia: s.n., 1573).

<sup>196</sup> *The English Pilot. Part III. Describing the Sea-Coasts, Capes, Head-Lands, Bays, Roads, Harbours, Rivers and Ports; together with the Soundings, Sands, Rocks and Dangers in the whole Mediterranean Sea...* (London: J. Mount and T. Page, 1771).

<sup>197</sup> Henry Michelot, *Portulan de la mer Méditerranée, ou Guide des Pilotes Côtiers, par H.M., ancien Pilote Hauturier sur les Galères. Nouvelle édition corrigée et augmentée de la description des côtes du Levant et des Isles de l'Archipel par un autre navigateur* (Marseille: Jean Mossy, 1805).

<sup>198</sup> John Stewards, *General Directions for the Navigation of the Archipelago, with remarks on several ports and anchorages in that sea, together with a few correct latitudes, and magnetic bearings, of various places therein, by J.S. Esq., Captain of His Majesty's Ship Seahorse* (s.l. [London?]: s.n., 1826).

Lamberti and I.G. Mavrommatis (1872).<sup>199</sup> As a text Borgian Portolans are close to the plain earlier texts, while a text such as the second *Borgian Portolan*, the *traverso*, is not to be found in the 18<sup>th</sup> century. Nevertheless, the place names have nothing in common with *Pīrī Re'īs*, nor are corrupted forms of Italian toponymy. Unfortunately, the paper of the manuscript has no watermark, so it is rather difficult to date it. Ettore Rossi, who published the catalogue of Turkish manuscripts in the Vatican Library, dates it in the 19<sup>th</sup> century.

I consider that the manuscript is better dated in the second half of 18<sup>th</sup> century. As a text it is similar to those of the 16<sup>th</sup> century, as the nautical instructions of the 17<sup>th</sup> century become more detailed and rich in information. I think it is a late text of an old tradition in maritime technology, which it carries frozen two centuries later. Of course, it is a sign of the separation from the Pirreisian authenticity and reform efforts, without to replenish its scope, even if this strict and decent text itself does not have such claims. It must be the work of an ordinary seaman, result of observation on the spot and multiple experience, last

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<sup>199</sup> I have consulted the Greek translation/compilation of this guide, which was printed in Hermoupolis/Syros Island in 1872 as *Λιμενοδείκτης της Μεσογείου θαλάσσης, του Αδριατικού κόλπου, των νήσων του Αιγαίου, της Θαλάσσης του Μαρμαρά, των ακτών της Ανατολής, Συρίας, Αιγύπτου και Αφρικής. Λιμενοδείκτης του Ελλησπόντου, της θαλάσσης του Μαρμαρά...* [*Pilot for the Mediterranean Sea, the Adriatic Gulf, the Aegean Islands, the Sea of Marmara, the Shores of Anatolia, Syria, Egypt and Africa. Pilot to the Dardanelles, the Sea of Marmara...*], συγγραφέας μεν υπό του Άγγλου υδρογράφου Ι.Γ. Νοριέ και του Ιταλού καθηγητού της ναυτικής Λουδ. Λαμβέρτου, μεταφρασθείσα δε και επεξεργασθείσα υπό Ιορδάνου Γ. Μαυρομμάτου (Ερμούπολις: Τυπογραφείον της «Πατρίδος», 1872). The compiler Iordanis G. Mavrommatis translated and adapted from two nautical guides of the 19<sup>th</sup> century: Luigi Lamberti, *Portolano del mare Mediterraneo. Nuova edizione corretta e notabilmente accresciuta da L. Lamberti* (Livorno: Nanni, 1844); expanded edition as *Portolano dei mari Mediterraneo e Adriatico, del Mar Nero e del Mare di Azof. Compilato dal L.L.*, 5th edition, 2 vols (Livorno: Fabbreschi, 1871), and J. W. Norie, *The New Mediterranean Pilot* (London: J.W. Norie, 1817); reprinted *The Complete Mediterranean Pilot* (London: Charles Wilson, 1845).

Ottoman impetus to the nautical know-how, before the arrival of the French and English handbooks and the definite subjugation of the Ottoman Navy to European navigation art and science.<sup>200</sup>



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<sup>200</sup> On Ottoman and Turkish maritime activities see in general Ali İhsan Gencer, *Türk denizcilik tarihi arařtırmaları* (İstanbul: Türkiye Denizciler Sendikası, 1986), and Cořkun Güngen, *Türk denizcilik tarihi bibliyografyası* (Ankara: Genel Kurmay Başkanlığı Deniz Kuvvetleri Komutanlığı, 1995).

## CONCLUSION

The topic of this thesis was the sailing-directions texts written in Ottoman language during the 16<sup>th</sup> century. The thesis begun with a general introductory reference to the historical developments, since the coming of the Turkic tribes to Asia Minor. It traced the Turks' acquaintance with sea and seamanship and followed the gradual achievements of the Ottoman state's navy and navigational skills connected with its people. Then the technique of navigation and the evolution of navigational technology in the Mediterranean were discussed, with a focus on the Early Modern Times. The world of the Mediterranean mariners, their common share on board, their exchange of ideas and know how, their common mixed language were studied right after. Another chapter was devoted to the development and use of the orientational maritime technology of the sailing-directions texts for Mediterranean waters compiled in a variety of languages since the Antiquity till the 16<sup>th</sup> century. Finally, the main chapter dealt with the Ottomans' reaction towards this genre of maritime know how.

The three texts, which were the result of the research done in catalogues and libraries themselves in Turkey and abroad were presented and discussed. The two of them are eponymous and dated, while the third one is anonymous and undated, but may be connected with the technological trend of the genre of the 16<sup>th</sup> century.

The first text by Pīrī Re'īs is a mixed sort of manual, which combined a) sailing directions, b) navigational treatise of the kind of *Arte del Navigare*, c) a detailed book of the islands (isolario) and coasts, while it had also features and was subsequently treated as, d) an atlas, and, e) a geography handbook. In fact these two last uses of it made the work so popular. There is a list of more than forty surviving and known today copies of the book, which was reproduced since the first version of 1520-1521 till the late 18<sup>th</sup> century, when the youngest dated manuscript was compiled. This is a period of almost three centuries that the work met a continuous interest. The personality and the book itself is the most well documented one in both primary and secondary sources of earlier documentation and modern scholarship.

The second text by Ḥācī Muḥammed Re'īs is dated in the late 16<sup>th</sup> century and is preserved in three copies, the youngest of them dates in the 1630's. There is a possibility that the same person is the author of a portolan-chart of the Aegean dated 1590-1591, who was called Muhammed Reis ibn Menemenli. The text of Ḥācī Muḥammed Re'īs is a pure sailing-directions text and served the needs of the Ottoman-speaking mariners who sailed all around the Mediterranean and the Black Seas. It belongs to the texts called *traverso*, and it provides in a repeatedly form the distance in miles and the orientation according to the mariner's compass among two spots, i.e. ports or islands.

The third text is anonymous. It is preserved in a single copy, which may be dated in late 18<sup>th</sup> century. It consists of two texts, which I named *Borgian Portolan*

*1 and 2.* The first portolan deals with the coasts and islands of the Aegean giving navigational information in a rather detailed form, while the second portolan is a *traverso* of the Aegean and Eastern Mediterranean seas. Their technology is closer to the know how of the sailing directions of the 15<sup>th</sup> and 16<sup>th</sup> centuries.

For a naval power like the Ottoman state, which evolved since the reign of Mehmed the Conqueror as a factor of imperial strength and significance in the row of the events of the Mediterranean, the Near Eastern and the European worlds, the aforementioned production seems to be rather limited. The Italian city-states and mainly Venice were developed powers in sea trade and maintained a considerable navy in both technology of shipbuilding and navigation, and in numbers. The Italian peninsula was the first place, where sailing-directions appeared in the Early Modern Mediterranean. Spaniards and Catalans followed, but soon concentrated themselves in the transoceanic routes. The same did the Portuguese leaving the Mediterranean geography aside. The Arabic production if this genre was limited into two authors, followed the technique of astronomical navigation and dealt with the Indian Ocean. The Greek portolan-texts of the period although quite numerous, they seem to base themselves mainly to the Italian production. The French, English and Dutch production began to appear towards the end of the 16<sup>th</sup> century and do not seem to have affected the intra-Mediterranean production of the same century. I

have no information on sailing directions written in Hebrew (or Ladino or Yiddish) or in Slavic languages in order to serve Jewish or Slavic<sup>201</sup> pilots of the same era.

The navigational technology in general and for the period studied seems to have been mainly an Italian first and then Iberian production. The Italian peninsula being exactly in the center of the Mediterranean basin made its technology to be spread easily around. I would consider the production of Greek portolan-texts, and for the reasons discussed in the relevant chapter (Ch. 4), as done in the periphery, not in the center of the technological lead. Their language is full of Italian maritime terminology that Greek-speaking mariners were hearing their Italian colleagues to use on board. Additionally, the toponymy used follows the Italian and Venetian ways, even in place names of Greek root. The Greek-Italian relations and contacts is a story that has its beginnings in the Antiquity, besides Venice and other Italian cities hosted Greek communities since the crusades and especially after the fall of Constantinople to the Ottomans.

The Ottoman sailing directions seem to be in the periphery of that technology for their own reasons. The barriers between Italians and Ottomans were more obvious, since the two states were rivals for long. They were never on the same side as allies. Aside from it, the barrier of the different and opposing religions gave to the situation less flexibility and more obstacles. It was easier for a Greek or

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<sup>201</sup> On the Ragusan Republic and its navy see, LUETIĆ, Josip. “«Prove di fortuna» di navi veneziane a Ragusa.” *Bollettino dell’Istituto di Storia della Società e dello Stato* 2 (1960): 211-221. LUETIĆ, Josip. “La marina mercantile della Repubblica di Ragusa nella marineria mediterranea e mondiale.” *Quaderni Pisaniani* 6 (1987): 15-37. LUETIĆ, Josip. “Ragusa e la sua marineria nella rivoluzione tecnologico-nautica e nel mondo mediterraneo (1250-1500).” *Storia e Civiltà* 4.4 (1988): 3-14.



a Slavic seaman to come in contact with an Italian or a Spaniard, relate the issues of the profession, exchange ideas, be shown the use of instruments and learn it. The wind of the Renaissance was blowing from Italy all around and made the development of new ideas and inventions easier. Over the peninsula were many centers to support financially the development of new technological trends, there were both professional and scholarly circles to incite research, and, also, printing houses to make ideas and techniques to circulate and be diffused. The Italian *homo* of the Renaissance was prepared to ask *why* and unrestful till he found the response to his queries and puzzles. The political, economical and social basis and developments in the Ottoman territories were not the same. There was a strong state to ask for more power, there was technology invented and supported, nevertheless in a lesser and limited scale. In the Ottoman society there were also controversial powers and groups. For instance, the history of the first observatory in the Ottomans is a rather indicative one of the actual environment. Taḳīū'd-dīn came from Damascus and Cairo to Istanbul, where he was appointed chief astronomer (*müneccimbaşı*) to the sultan in 1571. He was a significant scholar with a huge production in Arabic. He was largely responsible for persuading Murad III to found an observatory in Istanbul, which in fact took place in 1579. Two years later and due to an incorrect prediction as a pretext the observatory was pulled down after a sultanic decree was issued. The Şeyhülislam Kadızade Ahmed Şemseddin Efendi motivated that reaction and within a night the ex-corsair and then admiral Kılıç Ali Reis undertook the task to demolish the building with the

canons of his ships. The Ottomans acquired another observatory only in 1911, after three hundred and thirty years.<sup>202</sup>

The development of techniques and positive scientific knowledge was rather a personal, as in the case of Pīrī Re'īs,<sup>203</sup> or limited in time endeavor.<sup>204</sup> It

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<sup>202</sup> On Taqī' d-dīn and the Istanbul observatory see MORDTMANN, J. H. "Das Observatorium des Taqī ed-Dīn zu Pera," *Islamica* 13 (1923): 82-96. SAYILI, Adnan. *The observatory in Islam* (Ankara: Türk Tarih Kurumu, 1960), 289-305. ÜNVER, Suheyl. *Istanbul Rasathanesi* (Ankara: Türk Tarih Kurumu, 1969). İHSANOĞLU, Ekmeleddin (ed). *Osmanlı astronomi literatürü tarihi*, haz. Ekmeleddin İhsanoğlu, Ramazan Şeşen, Cevat İzgi, Cemil Akpınar, İhsan Fazlıoğlu, 2 c. (İstanbul: İslām Tarih, Sanat ve Kültür Araştırma Merkezi-IRCICA, 1997), 199-217.

<sup>203</sup> Katib Çelebi states that Muslim seamen are using Pīrī Re'īs's manual, because there are no other books of this kind in the Muslim world: "Mezbūr Pīrī Re'īs Bahriyye nām kitāb yazub Ak Deñiz aḥvālın anda beyān eylemişdür. İslāmiyānuñ bu fende andan ğayrī kitābı olmamağla ekşeriya deryāda gezenler aña murāca'at ederler." See KĀTİB ÇELEBİ. *Tühfetü'l-kibār fi esfāri'l-bihār* ([İstanbul]: Maḥba'a-i Bahriyye, 1329 [1911?]), 62.

<sup>204</sup> No navigational work of the quality of the Book on Navigation by Pīrī Re'īs was produced in the Ottomans after him. Nobody seems to have worked in doing observation on the spot and promoting the development of navigational theory. The production of Istanbul emerged in the periphery of the central Italian-Venetian school, from which it seems that drafted its sources. The case of Pīrī Re'īs has been exceptional, and had no significant followers in the field of Islamic hydrography and navigation, as it happened in Italy, where the environment and the situation was different. The work of Pīrī Re'īs could be connected with the Renaissance trend in Italy, since he used western sources, as well as entered in the field of technological competition with Italian and Spanish mariners. The study of the phenomenon of Renaissance and its connection, adoption or projection on the Ottoman world is a topic that needs to be studied further. I would not agree with the easy way Cerabregu considers Pīrī Re'īs a man of the Ottoman Renaissance. See CERABREGU, Muharrem. "Scientific benefits from Piri Reis's Kitab-i Bahriye and its position in the history of cartography." *XI. Türk Tarih Kongresi, Ankara, 5-9 Eylül 1990* (Ankara: Türk Tarih Kurumu, 1994), 3: 1105-1125, esp. pp. 1111 and 1124. In the same manner, Cerabregu places Pīrī Re'īs as second in the series of important cartographers after Ptolemy, but this is are polemics, which Pīrī Re'īs himself would not agree with: "Feammā bir daḥī vardur. Cevābum ire şāhib kemāle çün kitābum/ḥaṭasma ki anuñ nāzar olalar taşīh etmek-ile kādīr olalar./Ol üstāda hüzā kılsun teraḥḥum ki eksüklügümi ide tefahhum./Tamām ide ki bula bir ḥaṭayı bula ol bir ḥaṭāya biñ 'aṭāyı/ki yoçdurur 'ilme nihāyet buña bes kim ola ki bula ğāyet./Ne 'ilm ola ki ola intihāsı ne kul ola ki olmaya ḥaṭāsı (I have the wish that my work reaches the people who know, so that they find out my mistakes and correct them. May God assist the one who will undertake the task of the correction. Even if only one mistake he will correct, may he benefit a thousand times. Because knowledge has no limit, and even if it has, noone can find it. And since knowledge has no limit, the human

should be at the beginning of the 18<sup>th</sup> century onwards, when the speed of more adopting and less inventing technology was boosted. In this context I would conclude that the Ottoman sailing-directions texts we have in hands display that the Ottomans did reacted towards the navigational technological trends in the Mediterranean, did produce their own manuals, took part in the diffusion and exchange of skill among the Mediterranean mariners, nevertheless this was an activity of low production in terms of number, and hardly had followers in the consequent centuries.

Another reason for the scarcity of texts often presented by scholars is that the Ottoman state used in its navy and for the maritime matters people, who had a long tradition in shipbuilding and seafaring. The Greeks of the Aegean islands and shores were acquainted with the sea and navigation since many centuries. The Byzantine ports, dockyards, craftsmen and mariners were employed and reinforced by the Seldjukids, the Turks of the Beyliks and the Ottomans. The *azabs*, *levends*<sup>205</sup> and the crews<sup>206</sup> of the Ottoman ships were recruited from the local Greeks. Additionally the position of the Interpreter (Drogman) of the Ottoman Fleet<sup>207</sup> was mainly held by people of Greek origin. There is adequate documentation and

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mistakes find not end).” See Pīrī Re’īs, *Kitāb-ı Bahriyye*, Istanbul, Süleymaniye Ktph., MS. Ayasofya 2612, f. 427b.

<sup>205</sup> CEZAR, Mustafa. *Osmanlı tarihinde levendler* (İstanbul: Güzel Sanatlar Akademisi, 1965).

<sup>206</sup> ΣΦΥΡΟΕΡΑΣ, Βασίλης. *Τα ελληνικά πληρώματα του τουρκικού στόλου* (Αθήνα: χ. εκδ., 1968).

<sup>207</sup> ΣΦΥΡΟΕΡΑΣ, Βασίλης. “Οι δραγομάνοι του στόλου. Ο θεσμός, οι φορείς.” *Επετηρίς Μεσαιωνικού Αρχείου* 14 (1964): 1-192.

references on the topic in archival material and narrative sources of the period. These seamen knew the techniques of sailing and the regions of the Aegean and the Mediterranean seas were intimate to them. They could use portolan-texts in their own language. The same applied to converts from Western Europe or even Berbers, who were mostly Berber or Arabic-speaking. These people were able to sail, while using manuals in their own language. The Ottoman state with its imperial character was incredibly flexible in incorporating non-Turkish and non-Muslim elements in its structure. This has been one of the reasons of its success.

My research for portolan-texts in Ottoman language throughout the whole Ottoman period resulted in a single new work during the 17<sup>th</sup> century. Katib Çelebi composed a book called *Muntahab-ı Bahriyye* in 1645. This is a recent eureka of Fikret Sarıcaoğlu, who is going to present the work in detail.<sup>208</sup> Katib Çelebi based selectively his text on the Book on Navigation of Pīrī Re'īs, but added a series of other geographical information and maps to come up with a geography book that had a few sailing directions, but with no intention to be used by seamen on board. The third work presented in this study is preserved in a copy of the late 18<sup>th</sup> century, which is also the sole sailing directions text of those hundred years. This is the period, when the naval reforms under Selim III started to take place and French and German officers came to bring new technology to the Ottoman army. In the beginning of the 19<sup>th</sup> century and within the trend of the reforms the historian

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<sup>208</sup> For a first presentation see Fikret Sarıcaoğlu's article in ARI, Bülent (ed.). *Türk denizcilik tarihi* (Ankara: T.C. Başbakanlık Denizcilik Müsteşarlığı, 2002), 171-176.

Şanizade Mehmed Atullah presented another portolan-text,<sup>209</sup> which was a translation from a possibly French original. This work confirms the Ottomans' subjection to the imported western technology and science. The first printed sailing directions in Ottoman language were again a translation from a European original and marked a series of prints for the period 1871 to 1926.<sup>210</sup>



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<sup>209</sup> See FLEMMING, Barbara. *Türkische Handschriften, Teil 1, Verzeichnis der Orientalischen Handschriften in Deutschland, Band XIII, 1* (Wiesbaden: Franz Steiner, 1968), 263-264, and İHSANOĞLU, Ekmeleddin (ed). *Osmanlı astronomi literatürü tarihi*, haz. Ekmeleddin İhsanoğlu, Ramazan Şeşen, Cevat İzgi, Cemil Akpınar, İhsan Fazlıoğlu, 2 c. (İstanbul: İslâm Tarih, Sanat ve Kültür Araştırma Merkezi-IRCICA, 1997), 180-181.

<sup>210</sup> A forthcoming study of mine will deal with the Ottoman printed sailing-directions text.

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## APPENDICES



## APPENDIX A

This is the chapter on the Cycladic Island of Santorini from the book *Kitāb-ı Bahriyye* by Pīrī Re'īs. From the second version (compiled in 1526) copy held in İstanbul, Süleymaniye Library, MS. Ayasofya 2612, ff. 410b:

Bu faşıl Şāntörön nām cezīreyi beyān eder.

Mezkūr adanuñ nişānı budur kim üstü düz alçaq bir dağ gibi görünür. Hem kıble tarafı eyü demür yeridür. Şāntörön dedükleri taş kim şuya batmaz. Mezkūr adada çokdur. Aşıl kal'esi cezīre-i mezbūruñ karayel tarafında vāki' olmışdur. Ve ol kal'enüñ gün batısı tarafında Firāsiye dërler bir ada var. Mezkūr ada bir kara adadur. Ol adanuñ poyraz tarafında bir harāb k[i]lise vardur. Mezkūr k[i]liseye Aya Yirine dërler. Ol k[i]lisenüñ öñü küçük gemiye yatakdur. Ammā yıldız tarafından varurken poryaza muqābele olan burun şıgdur. Ve eger iki adanuñ ortasına demür qorlarsa deriñdür. Demür yeri bulunmaz. Eger yigirmi kulacdan artuqda demür qorlarsa demür de tutmaz. Hem ol bogazda bir küçük adacuk vardur. Mezbür adacuk

hemān kadırġaya beñzer. Adına amenı d rler. Mezk ruñ yıldız burnı Őıġdur. Ve ba'dehu mezk r Ő nt r n adasından arsiy ne on sekiz mild r g n batısı lodos  zerine. Mezk r arsiy ne iki alak adalardur. YaŐı mezk r n adalaruñ birbirine arŐu olan ken rları Őıġlıdur. Vel  gemi yatur yatadur. Ve ba'dehu mezk r Ő nt r n adasından Ayna cez resi yigirmi beŐ mild r. Ol yigirmi beŐ mil olan m beyn ñ kır ulacdan derin yeri yodur. Ő yle ma'l m olma. Ve's-sel m.



## APPENDIX B

The first ten distances between two positions or routes from the *traverso* portolan-text by Hācī Muḥammed Re'īs entitled *Tuḥfetü'l-esrār fī tarīki'l-bihār* (compiled at the second half of 16<sup>th</sup> century). From the copy held in Oxford, Bodleian Library, MS. Pococke 15, ff. 5a-6b:

Evvelā Kostantiniyyeden cezire-i Marmara yüz mildür.

Lodosuñ kerte batıdan cānibe teveccüh edeler.

Ba'dehu Marmaradan Gelibolu nām şehir ve mevzi' altmış /f.

5b/ mildür. Batınuñ kerte lodosdan cānibine teveccüh edüp Naķāra burnına dāhil olup andan boğaz hişārından sākin olalar.

Ba'dehu Kilīdü'l-baḥr ve Sultāniyyeden Bozca cezire nām

mevzi' otuz mildür. Lodos ile kıblenüñ mābeynine teveccüh edeler.

Ba'dehu Bozca cezireden Şıgrı limanı nām mevzi' seksen

mildür. Kıblenüñ kerte keşişlemeden cānibine teveccüh edeler.

Ba'dehu Şıgrıdan /f. 6a/ Sāķız nām cezire ve ķal'e altmış

mildür. Kıble ile keşişlemenüñ mābeynine teveccüh edeler.

Ba'dehu Sāķızdan Sūsām nām cezire altmış mildür.

Keşişlemenüñ kerte kıbleden cānibine teveccüh edeler.

Ba'dehu Sūsām nām cezīreden İstānköy nām cezīre seksen mildür.

Ba'dehu İstānköyden Rödös nām al'e ve cezīre yüz mildür.  
Gün doğısınıñ kerte poyrazından cānibine teveccüh edeler.

Ba'dehu tekrār /f. 6b/ Sāızdan cezīre-i andan ve İstindīl nām mevzi' yetmiş mildür. Batınuñ kerte lodosdan cānibine teveccüh edeler.

Ba'dehu İstindīlden Mökene nām cezīre on iki milden keşişlemenüñ kerte gün doğısından cānibine teveccüh edeler.

## APPENDIX C

This is the beginning chapter of the anonymous *Borgian Portolan 1* under the title *Baħr-i Sefidde olan cezireleriñ limanları beyānı*. The region described is the South-Eastern Peloponnesus. From the copy held in Vatican, Apostolica Library, MS. Borgiano Turco 72, ff. 5b-6a:

**Hālā Baħr-i Sefidde olan cezireleriñ limanları** beyānındadır.

**Manya** burmuna dört mil miqdārı qarīb bir liman vardır. **Adına**

**Porto Qalya** dirler. İçerü girmek iktizā(‘) ider ise limanı bilmek için

bir **kırmızı** burun var. Ol maħalle tođrı varasın ve ol maħalle mürür

eyledikde bir **ince** burun var. Muqaddem kırmızı burunu qalyonuñ

iskele tarafına ve soñraki ince burunu sancak tarafına qaldıqda

ikisiniñ ortasına gider iken sađ tarafında bir eski **kal’e** vardır.

Dā’imā ince burundan tarafa gidilür, zırā limanuñ ortasında bir şıđı

vardur. Üzerinde on beş qarış şuyu vardır. İnce burundan gecdikde

hemān temür barāđalu taşrasında /f. 6a/ palamar bağlanur, dađı

içerüye girmege tama<sup>c</sup> eylemiyeler. Zırā içerüsi şıđdur ve bođaz

ađzında gecdikde iki tarafından gecilür.



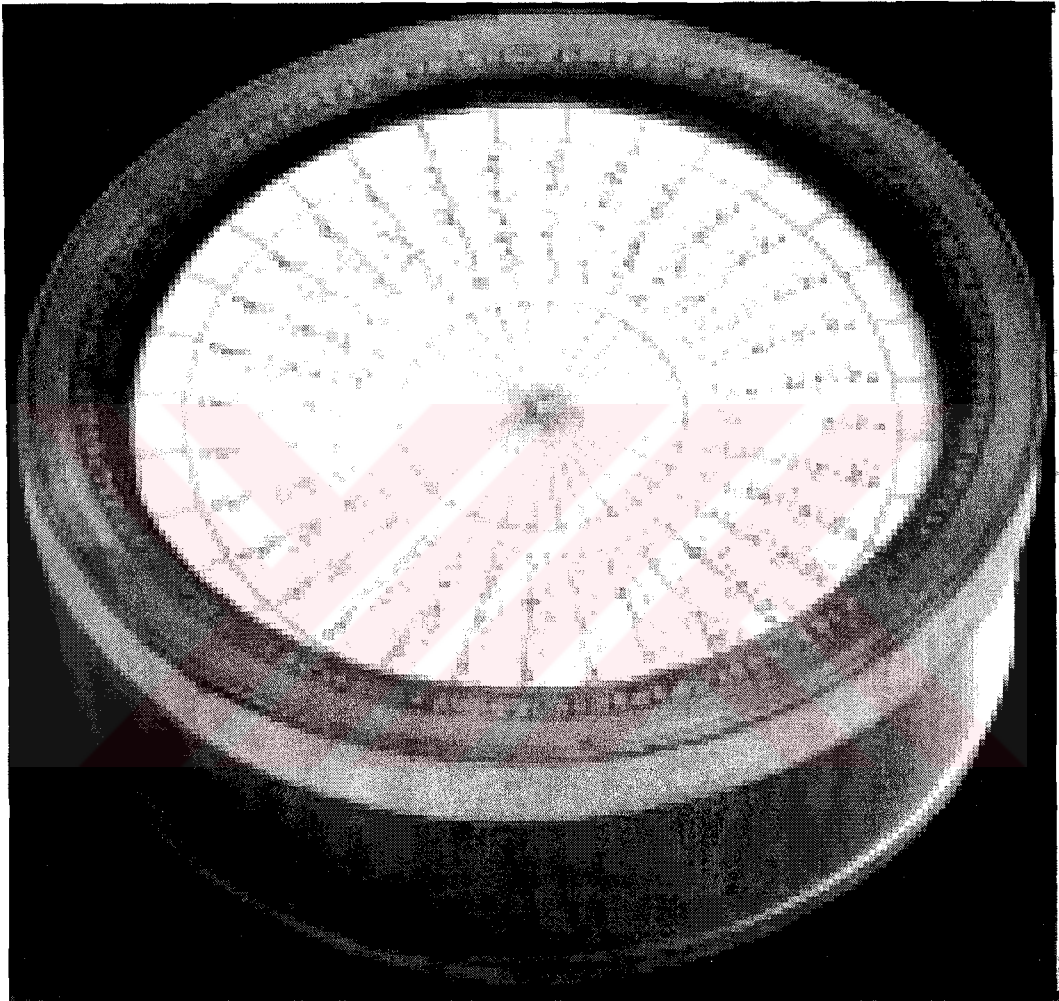
This is the first group of five distances between two positions or routes from the *traverso* portolan-text of the anonymous *Borgian Portolan 2*. From the copy held in Vatican, Apostolica Library, MS. Borgiano Turco 72, f. 30b:

*mil, 'aded*

- 18 Boğazdan Bozca ađa öni limanına kıble lodosa düşer
- 040 Bozca ađadan Baba burnına kıblenüñ bir bucuđ kerte lodos tarafına
- 046 Bozca ađadan Boz Baba batınuñ bir kerte lodos tarafına düşer
- 120 Bozca ađadan İřkiroza kıbla burnına lodosuñ bir kerte batı tarafına
- 160 Bozca ađadan Andire boğazı lodosa düşer

## FIGURES

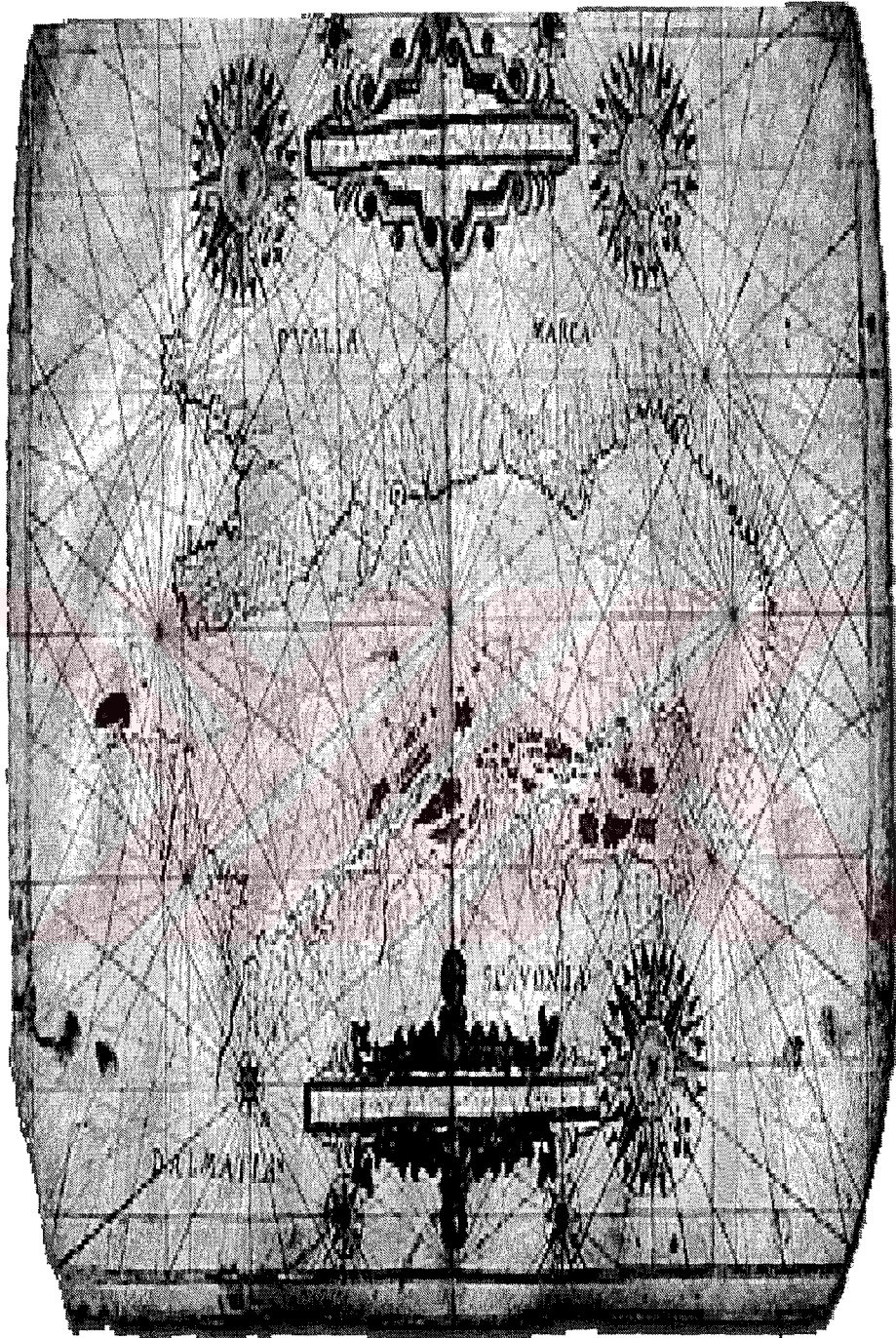




**Fig. 1.** The oldest extant Arabic compass. It was used for navigation in the Indian Ocean. Date 11<sup>th</sup>-12<sup>th</sup> Century.



**Fig. 2.** Arabic astrolabe.



**Fig. 3.** Portolan-chart of the Adriatic Sea by Placido Caloiro Oliva, 1649.

Dubrovnik, Maritime Museum.



**Fig. 4.** Portolan-chart of the type “normal portolano” by Albino de Canepa, 1489.

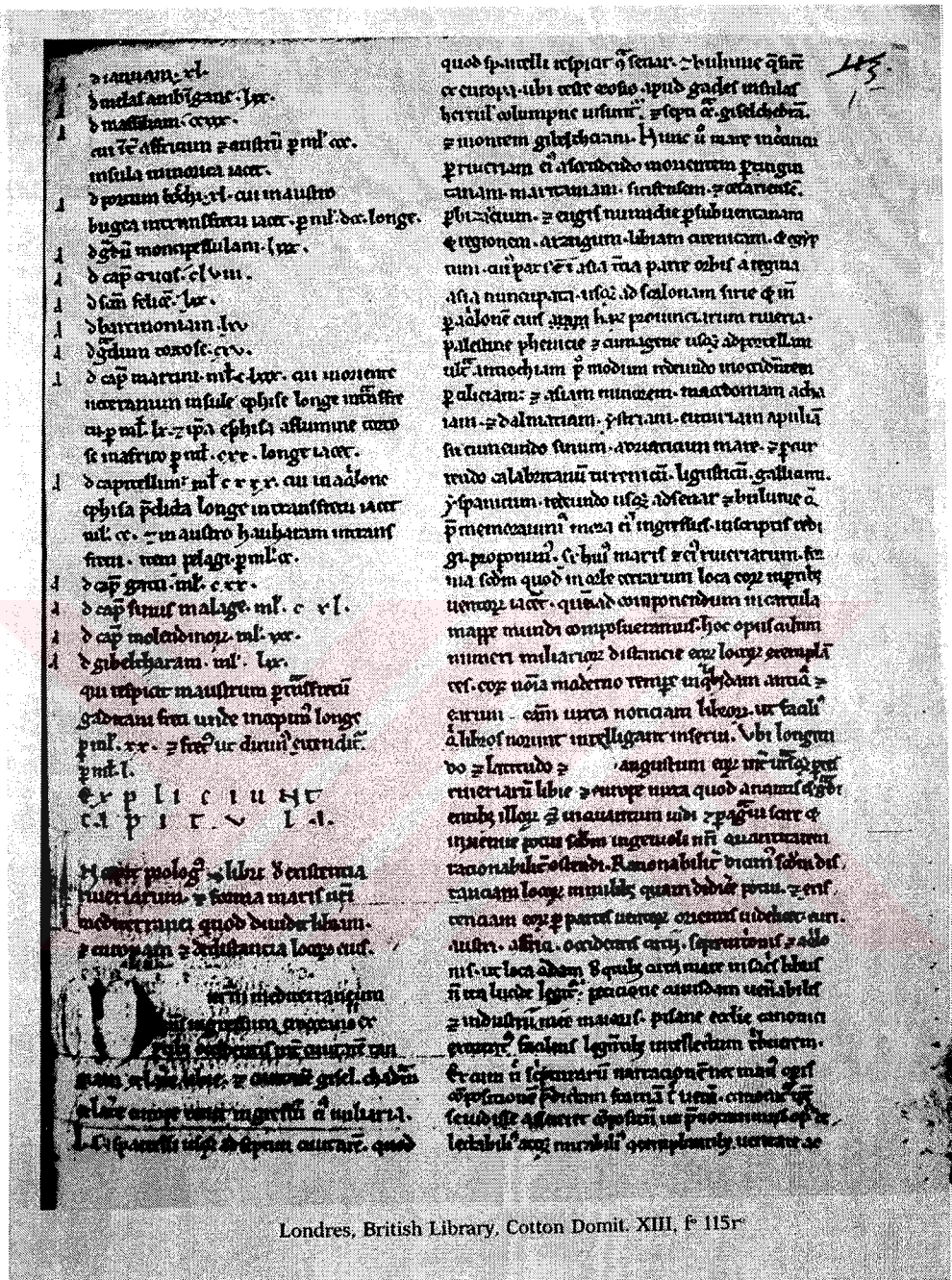
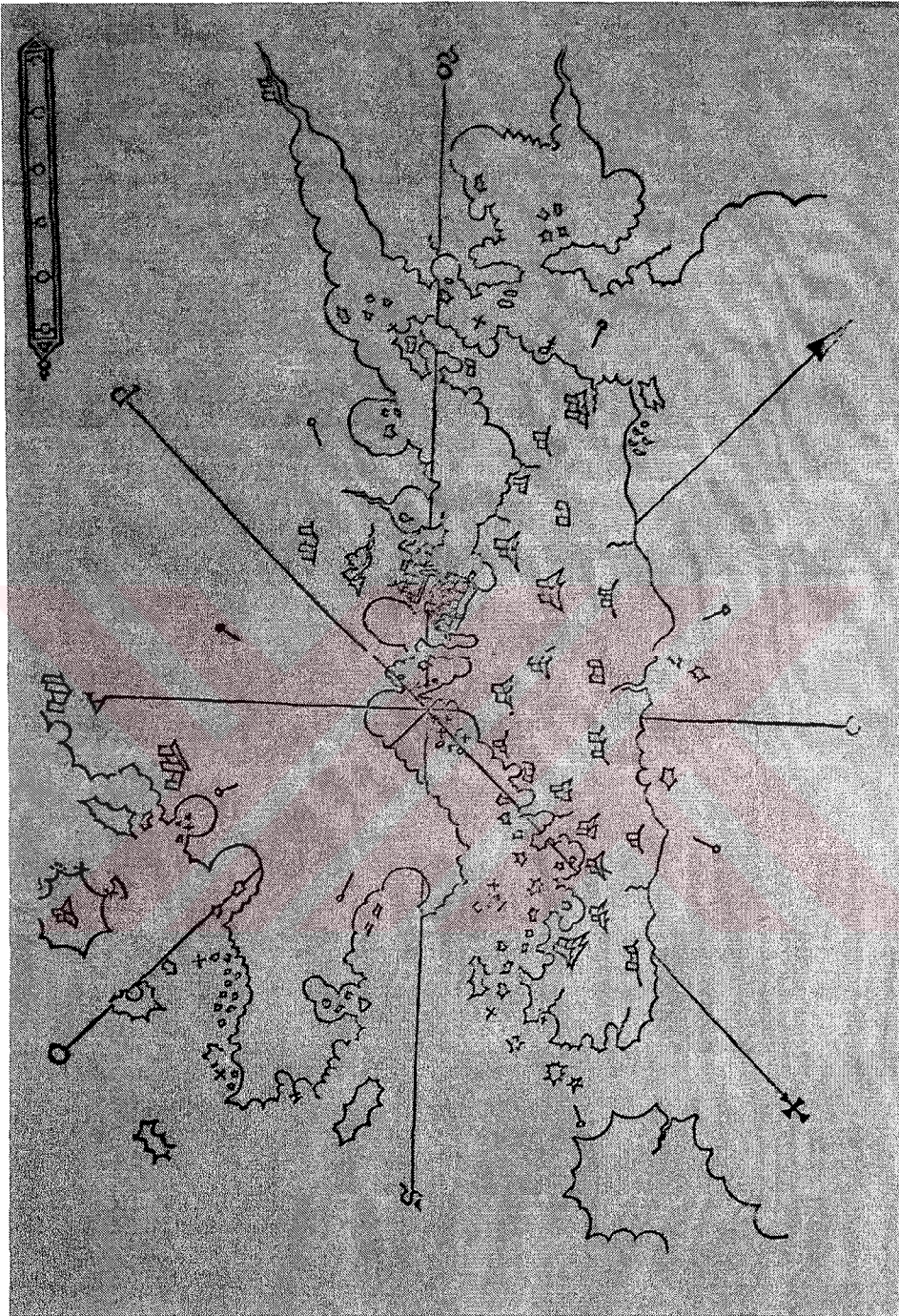
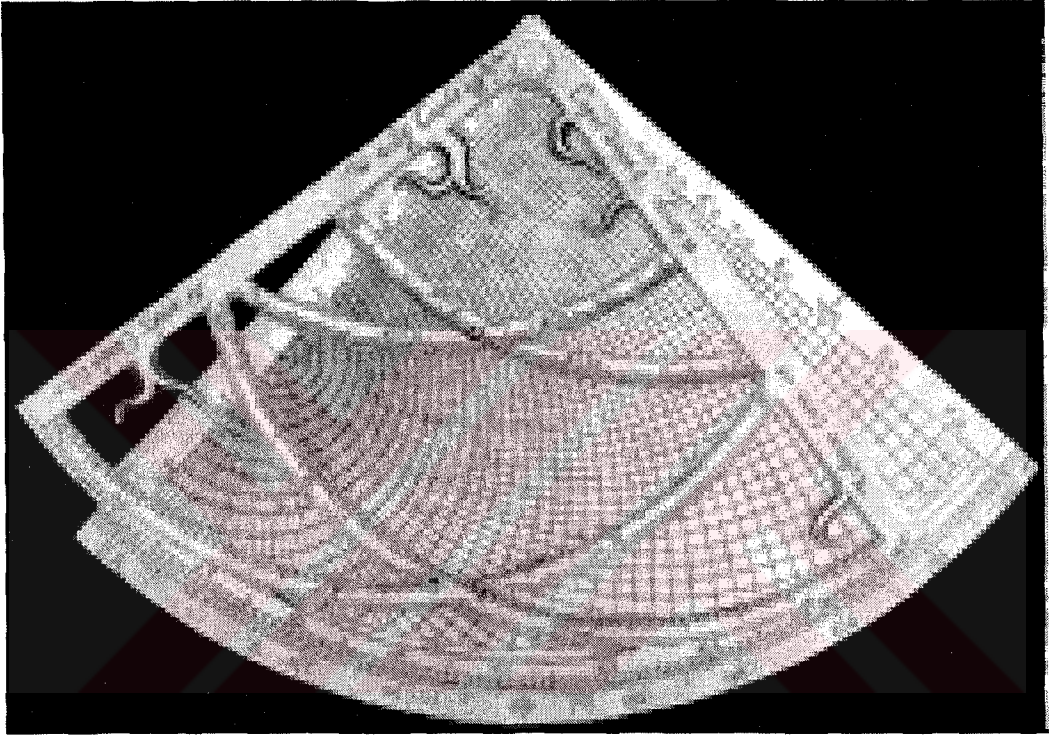


Fig. 5. The earliest known portolan-text of the Early Modern Times. Page from the *Liber de Existencia Riveriarum et Forma Maris nostril Mediterranei*, Pisa, circa 1200.



**Fig. 6.** The Euboea Island. From the printed book of the islands, *Isolario* by Bartolommeo dalli Sonetti, Venice ca. 1485.

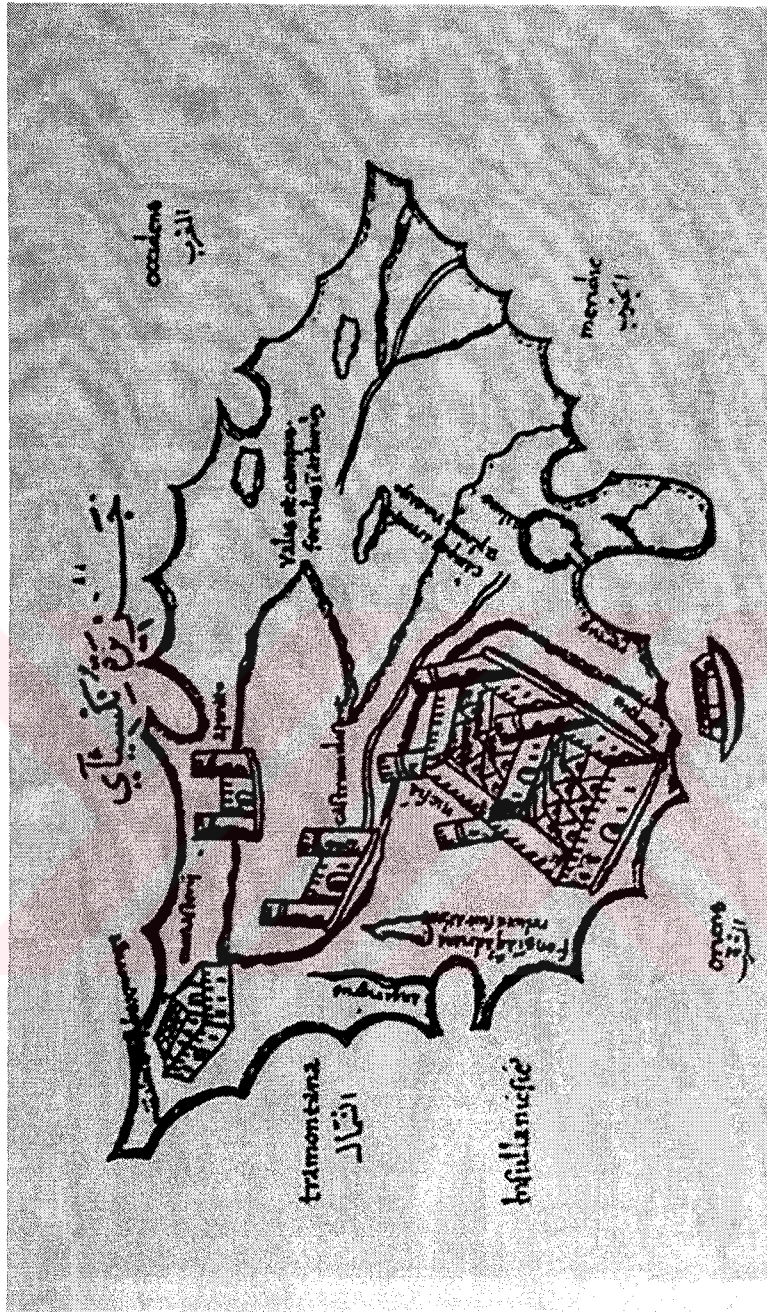




**Fig. 7.** Arabic quadrant.



**Fig. 8.** Arabic Maghrebian portolan-chart of Ibrahim al-Mursi, 1461. İstanbul, Maritime Museum Nr. 882.

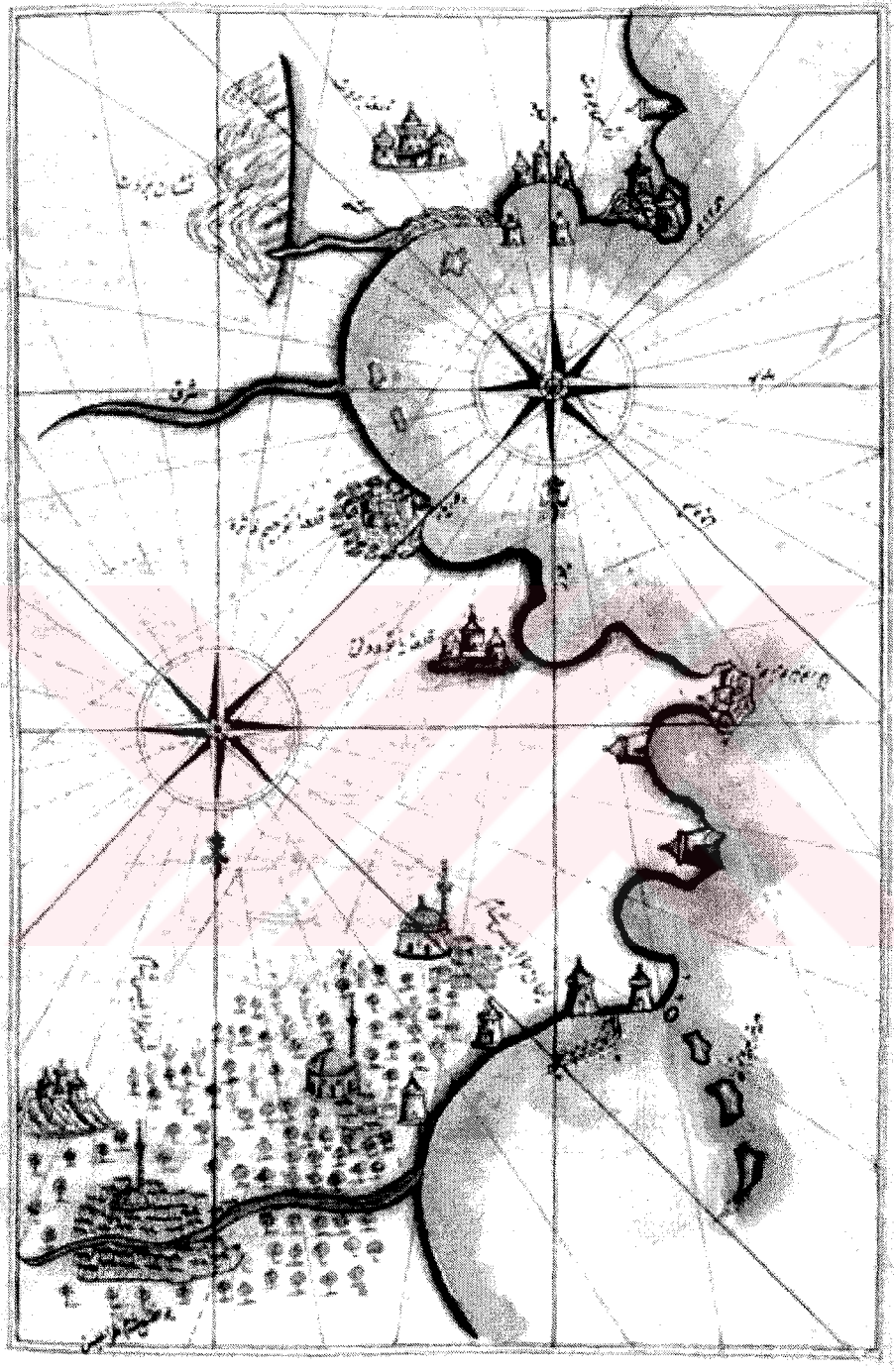


**Fig. 9.** The island of Naxos from Cristoforo Buondelmonti's *Liber Insularum Archipelagi*, ca. 1420-1430. Paris, Bibliothèque Nationale, MS. Lat. Nouv. Acq. 2383, f. 22v.



**Fig. 10.** The island of Leucada from the Piri Reis, *Kitab-i Bahriyye*, 1520-1526.

From a first version copy held in Kiel, University Library, MS. Ori. 34, f. 42a.



**Fig. 11.** Tripolis of Beirut. From the Piri Reis, *Kitab-i Bahriyye*, 1520-1526. A second version copy held in İstanbul, Maritime Museum.





**Fig. 13.** Portolan-chart of the Aegean by Mehmed Reis Menemenli, 1590-1591.

Venice, Museum Civico Correr, Port. 22.

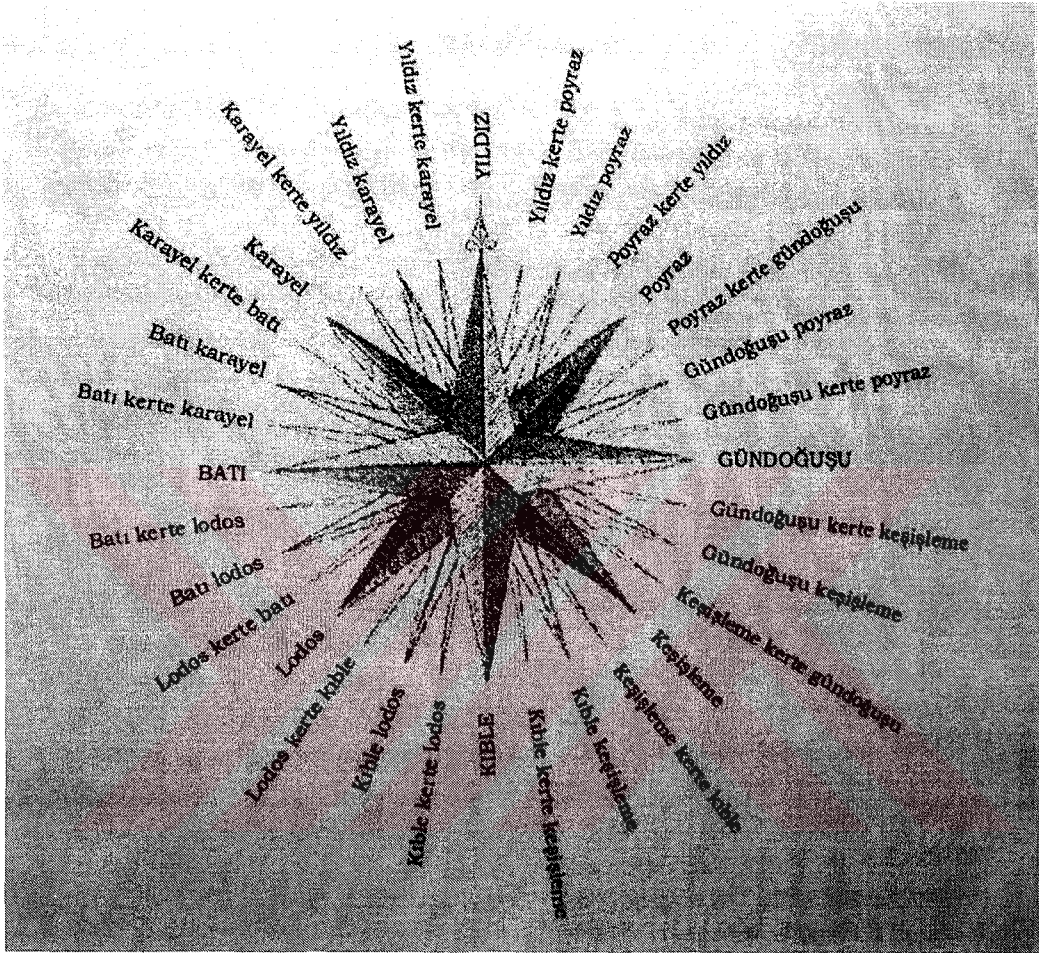
31

میل عدد	مغزین ساژک بویک بوغازنه کشتله تک برحق کرته قبله	۱۸
۲۸	ساژریدن ابصله باطنی تک برکرته قریل طره قنه دوش	
۳۵	ابصله دن قالیو بوز لودوسه دوش	
۴۵	انصاله دن بوز تا ما ملذیرک برکرته بوز طره قنه دوش	
۵۵	انصاله دن اشکروز قاره بیک ضایحه سنه دوش	
۶۰	ابصله دن اندر بوغازنه باطنی لودوسه وارپور	
۷۵	انصاله دن مقنور قبله لودوسه وارپور	
۸۰	انصاله دن قریوط قبله تک برکرته کشتله باطنی بوسه	
۹۰	انصاله دن وندک قیاسنه کشتله تک برکرته قبله قنه دوش	
۹۵	وندک قیاسندن قالیو پرو باطنی تک برحق کرته قنه دوش	
۱۰۵	وندک قیاسندن اندر بوغازی صافی باطنی وارپور	
۱۱۵	وندک قیاسندن مقنور واستند ارادسنه باطنی لودوسه وارپور	
۱۲۰	وندک قیاسندن مقنور کون طوغوسی طره دن اولان بوزنده قریوط	
۱۳۰	وندک قیاسندن توکیجه ایچی فرداشلر جزیره لودوسه برکرته قبله قنه دوش	
۱۴۵	وندک قیاسندن صوسام و فرولر بوغازنه قبله کشتله وارپور	
۱۶۰	وندک قیاسندن صوسامک دار بوغازنه کشتله تک برکرته کون بوسه	
۱۷۵	صوسام دار بوغازندن تک بوزنده قریل وارپور	
۱۹۰	تک بوزندن ساژر بوغازنه قریل بیک یلدر طره قنه یارم کرته دوش	
۲۰۰	ساژر بوغازندن صوسامک بویک بوغازنه قبله تک کشتله طره قنه	
۲۱۸	صوسامک بویک بوغازندن چهار جزیره کشتله به دوش	
۲۲۸	فرولور باطنوز و کچلر اراسی قبله تک برکرته لودوسه طره قنه دوش	
۲۳۷	باطنوز بوغازندن لونی اطله سنه لودوسه برکرته قبله طره قنه دوش	
۲۵۵	باطنوز بوغازندن استوبالده جزیره تک کون طوغوسی طره دن اولان بوز	
۲۷۰	باطنوز دن قاریوط جزیره باطنی طره قنه کون بوزنده قریل بیک برکرته قبله قنه دوش	
۲۸۹	باطنوز دن ایچی فرداشلره باطنک یارم کرته قریل طره قنه وارپور	
۳۰۵	ایچی فرداشلردن قلیوزک استاکوی طره قنه کون بوزنده کشتله تک	

Handwritten marginal notes in Persian script are visible on the left side of the page, including the number 31 at the top left.

Fig. 14. Portolan-text from the anonymous *Borgiano 2*. Vatican, Biblioteca Apostolica Vaticana, Borgiano Turco72, f. 31a.





**Fig. 15.** Windrose with Turkish terminology. From RASİM BARKINAY, Ahmet. *Adalar Denizi kılavuzu. İnözden Marmaris Burnuna kadar*, çeviren Mustafa Pultar (İstanbul: Tetragon, 2002), vii.