

The Nautical Atlases of ʿAlī al-Sharafī

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Abstract

The two extant atlases of the 16th-century Tunisian chartmaker and scholar ʿAlī al-Sharafī are indispensable documents for understanding the history and development of Maghrebi nautical cartography. They provide precious information on al-Sharafī's chartmaking techniques, production and sources, which include the output of his own family and the atlas of a certain Aḥmad al-Andalusī who had settled in Istanbul. The making, contents and characteristics of the atlases are examined in connection with the Maghrebi and Majorcan traditions of nautical cartography which positively influenced al-Sharafī's compilation of coastal place names. This is explained by the circulation of such cartography across the Mediterranean of his time. Further questions are also raised on the working conditions in which Maghrebi and Andalusian chartmakers flourished and the impact of their legacy.

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I. INTRODUCTION

1. The chartmaker al-Sharafī

°Alī al-Sharafī (fl. 1551-79) is the best known and the most popular of all Maghrebi chartmakers, with some thirty years of activity.¹ He belongs to a larger family of chartmakers from Sfax, an Islamic corsair port in Tunisia, from where he eventually moved inland to Kairouan.² Apparently, it was here that he finished one of his nautical atlases in 1571 and one of his sea charts of the world in 1579 which he signed as *...al-Ṣafāqusī mansha^{am} wa-mawlid^{am} al-Qayrawānī qarār^{am} wa-maskan^{am} al-Mālikī madhhab^{am}* (from Sfax by origin and birth, from Kairouan by settling and residence, al-Mālikī by legal doctrine). Al-Sharafī's two nautical atlases from 1551 and 1571,³ and a sea chart of the world from 1579 are his only extant works. Three other comparable charts can be safely attributed to him, according to a passage in his second atlas. Still,

¹ His cartography has aroused great interest among modern scholars, such as Nallino 1944 and Soucek 1992, pp. 284-87, 289, figs. 14.20-25 (b/w). For general references, see *GAL*, *Suppl.* 2, p. 710; Maḥfūz 1982-86, vol. 3, no. 281; *MGC*, vol. 12, pl. 7c-d (b/w) and vol. 13, pp. 430-31.

² At the beginning of the 16th century, the main industry in Kairouan was based on leather crafts for trade with Numidia: see Leon l'Africain: *Description de l'Afrique*. Translation by A. Epaulard, Paris, 1956, vol. 2, p. 398; quoted by M. Talbi: "al-Ḳayrawān," *EF* 4 (1978). The parchment obtained from animal skin was fundamental to Mediterranean chartmakers, as it was the material on which most sea charts and many atlases were made: see Astengo 2007, p. 182ff.; Campbell 1987, p. 376.

³ Henceforth, for the sake of convenience, these will often be designated as the first (1551) and second (1571) atlases.

repetitive features of his works suggest a regular production of such atlases and charts, which might have allowed him to earn a living as a professional chartmaker. The contents of the atlases attest to al-Sharafī's mapmaking skills, but also to his notions on medieval geography and folk astronomy, a knowledge which is not documented for every Mediterranean chartmaker.

2. The Sharafī family of chartmakers

The Sharafī family, originally from Sfax, ran the only recorded Maghrebi workshop in which chartmaking skills were probably taught by father to son, imitating the same kind of cartography for more than fifty years. The Sharafīs are widely known for their characteristic sea charts of the world which combine Mediterranean nautical cartography with al-Idrīsī's maps. Their extant output, though incomplete, represents the greater part of the surviving tradition of Maghrebi chartmaking. This includes another sea chart of the world by al-Sharafī's son (Muḥammad), dated 1600-01. All the family charts, including al-Sharafī's lost exemplars, were apparently derived from a prototype designed by his grandfather.

In the Mediterranean, family workshops were not restricted to the Sharafīs, and had already flourished in 14th-century Majorca with the Jewish chartmakers Abraham Cresques (fl. ca. 1375) and his son Jafudā (fl. ca. 1400), already professionally active.⁴ Between the 16th and 17th centuries, we find the prolific families of Prunes/Pruners, established in Majorca, and Oliva/Olives, of Majorcan origin but spread mainly in Marseille, Naples and Messina.⁵ The cartographic models of Majorcan

⁴ The former is believed to have been the author of the *Catalan Atlas*: see the latest edition as *L'Atlas Català* (2005); and the extensive description of it by Sáenz 2007. Distinctive features of this atlas appear in other anonymous sea charts which have been therefore attributed to the Cresques' workshop. These are compiled by Pujades 2007, C15-16, 18-20, 22 (with a commentary on p. 256ff.); see also Rosselló 2000. On Jafudā's activity in particular: R. Skelton: "A Contract for World Maps at Barcelona, 1399-1400," *Imago Mundi* 22 (1968), pp. 107-13. Moreover, Campbell 1987, p. 428ff. discusses the working techniques of 14th-15th-century Majorcan and Venetian workshops. Astengo 2007, pp. 189-91 deals with the same topic for the later period up to the 17th century.

⁵ Their production is listed by Rey & García 1960, pp. 45-46, 95-100, 119-63; and recently by Astengo 2007, appendix 7.1 (commentary on p. 207ff.). See the specific studies by G. de Reparaz: "Els Prunes, cartògrafs catalans dels segles XVI i XVII. A propòsit d'uns mapes inèdits d'aquests cartògrafs de Mallorca," *Estudis Universitaris Catalans* 13 (1928), pp. 324-402; and Rosselló 1995, pp. 39-41 ("Les cartes i els atlas dels Olives"). See also

workshops would eventually acquire financial value. This factor is documented by an affidavit from 1625, according to which Pere Joan Pruners (fl. 1625-51) had received in inheritance half of the models (*patrons de fer cartes de navegar*) belonging to his father, Vicenç Pruners (fl. 1597-1609).⁶ This poses the question whether the models in possession of the Sharafīs had ever gained financial worth.

The Sharafī family produced at least four consecutive generations of chartmakers:

1. The grandfather Muḥammad al-Sharafī al-Şafāqusī (fl. beginning of the 16th century), perhaps the earliest chartmaker in the family, is known to have made a sea chart of the world, apparently lost. His grandson (°Alī) and great-grandson's (Muḥammad) exemplars are based on this model.
2. The father is Aḥmad b. Muḥammad al-Sharafī al-Şafāqusī (fl. first half of the 16th century). His activity (*shughl*) as a chartmaker is suggested by his son °Alī al-Sharafī in his 1571 atlas (see the Arabic passage in section 5), who also says to have learned from him about the determination of prayer times by means of shadow lengths.
3. °Alī b. Aḥmad b. Muḥammad al-Sharafī al-Şafāqusī al-Qayrawānī al-Mālikī made at least two nautical atlases in 1551 and 1571, and four sea charts of the world: three possibly earlier than 1571, which are lost, and one from 1579.
4. The son Muḥammad b. °Alī al-Sharafī al-Şafāqusī is the author of another copy of the family sea chart of the world which he signed in 1600-01. This is extant in Paris, Bibliothèque nationale de France (Rés. Ge. C. 5089).⁷

Comes 2004, pp. 555-57; Rosselló 2000, pp. 38-41, 72-74. In addition, *Cartografia Mallorquina*, Barcelona, 2000 shows examples of their cartography which are kept at the Naval Museum (Museu Marítim) in Barcelona.

⁶ Cf. Pujades 2007, p. 213. A Latin transcription of Vicenç Pruners' 1609 testament is given by G. Llompart: "Registro de los cartógrafos medievales activos en el puerto de Mallorca," *Anuario de Estudios Medievales* 27:2 (1997), (pp. 1117-48) 1127, 1146-47.

⁷ See *Cartes nautiques sur vélin*, p. 98 (no. 60); and some remarks in Nallino 1944, pp. 540-41; Soucek 1992, p. 287, figs. 14.24-25 (b/w). Available reproductions: A) E.-F. Jomard: *Les monuments de la Géographie ou recueil d'anciennes cartes européennes et orientales... publiés en fac-similé de la grandeur des originaux*, Paris, 1842-62, pl. XII. This is a sketch facsimile of the chart in which the original Arabic place names have been

The scholarly activity of later members of the Sharafī family is recorded by the 18th-century chronicler Maḥmūd Maqdīsh of Sfax (*Nuzhat al-anzār fī ʿajāʾib al-tawārīkh wa-l-akhbār*).⁸ Among them, the most important is the *muwaqqit* Aḥmad b. ʿAbd al-Azīz al-Sharafī al-Azharī, who wrote a treatise on the astrolabic almuqantar quadrant (*Al-Durar al-fākhirāt fī l-ʿamal bi-rubʿ al-muqantarāt fī jamīʿ al-aqtār wa-l-jihāt*, comp. ca. 1735).⁹

3. Al-Sharafī's sea charts of the world

The extant 1579 sea chart of the world by ʿAlī al-Sharafī is kept at the Istituto Italiano per l’Africa e l’Oriente in Rome (size 59 × 135 cm).¹⁰ This is a copy of the prototype made earlier by al-Sharafī’s grandfather, and consists of two sheets of parchment pasted together. The eastern sheet covering Asia reproduces the regional maps of al-Idrīsī’s Geography (*Nuzhat al-mushtāq fī-ikhtirāq al-āfāq*, comp. Palermo ca. 1154) for that part of the world.¹¹ The western sheet, covering the Mediterranean, the

corrupted. It also omits the added Latin inscription on the neck of the parchment. B) *Mappae arabicae*, vol. 5 offers a large b/w sketch, including a transliteration of the main inscriptions. This is reprinted in smaller size in Pinna 1996, vol. 1, pp. 186-87. C) The latter provides a large colour plate which is the best and more reliable reproduction of the chart. D) Other small colour pictures appear in *Itinéraire du savoir en Tunisie*, p. 84; and *MGC*, vol. 12, pl. 8a.

⁸ See Maqdīsh, *Nuzha*, vol. 2, p. 390ff. This source is described by C. A. Nallino: “Venezia e Sfax nel secolo XVIII secondo il cronista arabo Maqdīsh,” *Raccolta...*, Roma, vol. 5 (1944), pp. 345-402.

⁹ See Maqdīsh, *Nuzha*, vol. 2, pp. 394-97, 400. He is also recorded in *Cairo Survey*, pp. 105-6 (D48); *GAL*, vol. 2, p. 612 & *Suppl.* 2, pp. 486, 694; Maḥfūz 1982-86, pp. 166 (no. 278), 170 (no. 280); Nallino 1944, pp. 541, 542; and Soucek 1992, p. 287.

¹⁰ This was first described by Nallino 1944, with an Italian translation and commentary of the main inscriptions; see the chartmakers’ signature on p. 536. Its size is given by Soucek 1992, p. 289. A small colour picture of the chart is in *The History of Cartography*, vol. 2:1 (1992), pl. 24; and Z. Chelli: *La Tunisie au rythme des cartes géographiques*, Tunis, 1996, pl. 22. A sketchy drawing of it appears in *Atlas of Islam* (1981 & 2001), pl. 1b; next to a reconstruction of al-Idrīsī’s image of the world (pl. 1a).

¹¹ On al-Idrīsī’s cartography, see Maqbul 1992, pp. 156-74; *Mappae arabicae* (K. Miller), vols. 1, 6; *idem: Weltkarte des Arabers Idrisi vom Jahre 1154*, Stuttgart, 1928; and

Black Sea and a section of the Atlantic (including the British Isles and south Scandinavia), is based on a Majorcan sea chart initially consulted by the grandfather. The use of this Majorcan source is stated in one of al-Sharafī's inscriptions which says: *Io ho copiato questo mappamondo (jughrāfiyā) da un altro disegnato da mio nonno Muḥammad –che Dio ne abbia misericordia– il quale aveva copiato le coste del mare Siro ed i suoi porti da una carta nautica (qunbās) fatta dalla gente di Maiorca –che Iddio la stermini–*.¹² Moreover, a passage in the 1571 atlas informs us that by that time al-Sharafī had finished three other sea charts of the world, equally based on al-Idrīsī's Geography. These charts, otherwise unknown, are described as follows:

قال كاتب الأحرف وصانع هذه الطبلة وفقه الله تعالى وأصلح أحواله وأعماله:
وقد برز مئى ثلاث جغرافيات¹³ كبار على حسب ما ذكره صاحب نزهة
المشتاق في اختراق الأفاق فيها صفة الأرض وذكر الأبحر المذكورة كلها وما
في الأرض من جبال وعيون وأودية ومدن مشهورة. وجهات كل منها على
حسب الجهات المعروفة عند الرؤساء حتى أنها ليسافر بها شرقا وغربا وجوفا
وقبله بحيث يُعرف منها كل مدينة أو جبل أو نهر أو بركة أو عين من أي
الجهات ومن أين تقصد وكذلك المراسي المعلومة بالإرساء فيها. فمن أراد ذلك
فليبحث عنها لأنها تنتقل من الأيدي على حسب الأقدار بموت أو حياة أو غير
ذلك من الأمور التي تنقل بها الأملاك.

The author of this text and manufacturer of this atlas (*al-ṭabla*) may God Almighty grant him success and improve his conditions and deeds—says: I have already produced three *large world maps (jughrāfiyāt kibār)* based on the description of the author of *Nuzhat al-mushtāq fī-ikhtirāq al-āfāq*. They contain a depiction of the world (*ṣifat al-arḍ*) with the names (*dhikr*) of all the known seas, mountains, springs, rivers and famous cities. All wind directions (*jihāt*) are drawn in accordance with those familiar to sea captains, to enable them to sail (*li-yusāfira*) east, west, north and south, and to learn from where and in which direction they should head for any city, mountain, river, lake or spring, as well as for

especially *La Géographie d'Idrīsī: Un atlas du monde au XII^e siècle*. Digital facsimile of MS Paris, Bibliothèque nationale de France: arabe 2221. Coord by A. Vernay-Nouri, Paris, 2000.

¹² Cf. Nallino 1944, p. 538.

¹³ MS: جغرافيات

renowned harbours and anchorages. Whoever wants them should look for their whereabouts for, like all worldly belongings, they change hands, due to death or other vicissitudes of life.

[1571 atlas, fol. 3r]

Al-Sharāfī calls these three works *large world maps* (*jughrāfiyāt kibār*),¹⁴ and hints at their utility in (Mediterranean) navigation because of their wind directions. He also denotes this kind of chart as *jughrāfiyā* (lit. geography) in the above mentioned inscription of his 1579 exemplar.¹⁵ Curiously enough, an equivalent expression appears in a note on the back of Gabriel de Vallseca's 1439 chart, which describes it as *ampia pele di geografia* due to its large size (75 × 122 cm).¹⁶ In the 14th-century encyclopaedia of Ibn Faḍlallāh al-ʿUmarī (*Masālik al-abṣār fī mamālik al-amṣār*), the term *jihāt* (pl.) is already applied to the nautical wind directions, and their graphical representation (as rhumb lines) on Mediterranean charts.¹⁷ These are actually drawn in the extant sea charts of the world by al-Sharāfī and his son (1600-01), which show a network of wind directions on each sheet of parchment. This network has a decorative, rather than practical, utility on the sheet covering Asia. The

¹⁴ The term *jughrāfiyā* (sing.) is a transliteration of the Greek *geography* (γεωγραφία), though in Arabic it was also used for a world map, see S. Maqbul: "Djughrāfiyā," *EF* 2 (1965); *idem*: "Kharīṭa," *EF* 4 (1978), p. 1077. Andalusian and Maghrebi sources, among them al-Sharāfī (in both his 1571 and 1579 works), render the term as *jaʿrāfiyā* (changing *ghayn* for *ʿayn muhmala*) instead of the standard *jughrāfiyā*. This is attested in the title of al-Zuhri's Geography (Granada, 12th century), which is edited as *Kitāb al-Jaʿrāfiya* by M. Hajj-Sadok, in *Bulletin d'Etudes Orientales* 21 (1968), see pp. 22-23 (translated by D. Bramon: *El mundo en el siglo XII*, Barcelona, [1991], p. xv). This particular spelling is recorded by R. Dozy (*Supplément*, vol. 1, p. 198) who quotes from Ibn Khaldūn (d. 1406) and al-Maqqarī (d. 1632).

¹⁵ Cf. Nallino 1944, p. 538. See footnote 43.

¹⁶ This note was written on the occasion of selling the chart to Vespucci around 1480, and reads: *Questa ampia pele di geografia fu pagata da Amerigo Vespucci CXXX ducati di oro di marco*. Cf. O. López: "Col·lecció del Museu Marítim de Barcelona," in *Cartografia mallorquina*, Barcelona, 2000, (pp. 89-111), 109 (and fig. on p. 108); Rosselló 1995, (pp. 53-56, pl. 3) p. 53. On Vallseca and his works, see Pujades 2007, C40-43, 74 and p. 260. The visual features of Vallseca's cartography are discussed in comparison with those of the *Catalan Atlas* and other 14th-15th-century Majorcan charts by Sáenz 2007.

¹⁷ See Ibn Faḍlallāh: *Masālik...* Facsimile reconstruction by F. Sezgin, Frankfurt a. M., 1988, vol. 2, pp. 165-75; and a commentary in *MGC*, vol. 11, pp. 49-58, vol. 12, pl. 34a-d.

close similarities between the extant charts by the Sharafīs suggest that the lost exemplars might have shared with them comparable features in terms of cartography, wind system, format and decoration.

The idea of producing an extended sea chart that would depict the whole world known to the medieval scholars was not unique to the Sharafī family. In Majorcan nautical cartography this is attested on a different format in the *Catalan Atlas* and the Catalan World Map of Biblioteca Estense (henceforth, *Estense World Map*) attributed to the Jewish chartmakers Abraham Cresques (fl. ca. 1375) and Pere Rossell (fl. 1447-69) respectively.¹⁸ In addition, it has been proposed that two charts of Angelino Dulcert (1339) and Jehudā ben Zara (1497) were originally larger than the existing one piece parchment covering the Mediterranean.¹⁹ If that be true, these charts might have had a surface shape and extension more or less akin to the Sharafīs' works.

4. Other Maghrebi and Andalusian chartmakers and their output

The few Arabic sea charts of the Mediterranean that are known bear witness to the blossoming of a class of highly skilled Maghrebi and Andalusian chartmakers who had settled in Tunisia (Tunis, Sfax and Kairouan), Tripoli and Istanbul. The timeframe of their cartographic output spans from the first half of the 14th century to 1600, and includes the anonymous Maghreb Chart (ca. 1325-50).²⁰

¹⁸ See the modern edition of the *Estense World Map* (MCE 1995 in the final bibliography), besides the studies by Pujades 2007, esp. pp. 260-61; and mainly Sáenz 2007, p. 320ff. Other charts by Rossell are described by H. Winter: "Petrus Roselli," *Imago Mundi* 9 (1952), pp. 1-11; while Rosselló 2000 discusses the chartmaker. The *Catalan Atlas* is mentioned in footnote 4.

¹⁹ This hypothesis is presented respectively by R. Pujades (see his contribution to *L'Atlas Català*, vol. 1, p. 24ff.) and R. Almagià (*Monumenta cartographica vaticana*, vol. 1: *Planisferi, carte nautiche e affini dal secolo XIV al XVII*. State of the Vatican City: Biblioteca Apostolica Vaticana, 1944, pp. 47-48, pl. XIX). It should be noted that Ben Zara's chart is signed in Alexandria, but belongs to the Majorcan tradition. On the chartmaker Angelino Dalorto/Dulcert, see also Pujades 2007, C7-9, pp. 254-56; and Sáenz 2007, p. 299ff.

²⁰ This is kept at Milan, Biblioteca Ambrosiana: SP II 259. On the Maghreb Chart, see mainly Vernet 1962; besides Herrera 2008, pp. 287-88; *MGC*, vol. 11, pp. 27-31, 57, vol. 12, pl. 35 and vol. 13, p. 11ff.; Pinna 1996, vol. 2, pp. 112-23 (with a superb colour plate);

Aḥmad al-Ṭanjī is the only recorded chartmaker to have lived in Tunis before the Sharafī family. His extant sea chart of 1413-14 is a highly sophisticated example of Islamic cartography, in terms of accuracy and illumination.²¹ Its comprehensive coverage of Arabic coastal place names for the Islamic Mediterranean hints at the existence of other 14th/15th-century Maghrebi, and to some extent Andalusian, sea charts that al-Ṭanjī could have used. These earlier sources should have laid the groundwork of Arabic nautical toponymy and hydrographic details which characterize the later Maghrebi chartmaking.

Ibrāhīm al-Mursī was active in Tripoli, maybe Tripoli in Syria, where a community of *moriscos* had settled after the fall of Islamic Murcia in 1243. His extant sea chart is a luxurious piece dated 1461.²² Al-Mursī is not the only Andalusian chartmaker in the Islamic Mediterranean, for a certain Aḥmad al-Andalusī is supposed to have flourished in Istanbul (see below). Their background raises many questions about the nature of the Andalusian contribution to the Maghrebi (and perhaps Ottoman) chartmaking tradition, and about their degree of exposure to the language in which the Majorcan cartography was written.

These Maghrebi and Andalusian chartmakers were not fully independent from the influence of Majorcan and Venetian nautical cartography from which they borrowed visual features and place names; the latter mainly for Mediterranean Europe and the Black Sea. Al-Ṭanjī brings together elements from both Majorcan and Venetian sources,²³

Soucek 1992, pp. 263-64, fig. 14.1. Additional discussion on the dating of the chart is offered by Campbell 1987, pp. 418, 423, 445.

²¹ This is kept at Istanbul, Topkapi Library: Hazine 1823, and has been described by Herrera 2008. See also *MGC*, vol. 11, pp. 31-32, 39, 40, 136, vol. 12, pl. 36 and vol. 13, p. 13ff.; Soucek 1992, p. 264, fig. 14.2; and D. Uçar: "Über eine Portolankarte im Topkapi-Museum zu Istanbul," *Kartographische Nachrichten* 37 (1987), pp. 222-28.

²² This is kept at Istanbul, Naval Museum (Deniz Müzesi): no. 882. See *MGC*, vol. 11, pp. 32-33, vol. 12, pl. 37; Soucek 1992, pp. 264-65, fig. 14.3; and M. Comes: "Ibrāhīm al-Ṭabīb al-Mursī," in *Las artes y las ciencias en el Occidente musulmán*, Murcia, 2007, pp. 74-81; *idem*: "Barcelona a la cartografia náutica àrab" (forthcoming); and Herrera 2009.

²³ According to Herrera 2008, al-Ṭanjī's work shows similarities with the chart of Albertin de Virga (1409) and the anonymous kept at Barcelona (Archive of the Crown of Aragon: no. MP-1). These are in turn strongly influenced by the style of the Venetian chartmaker Pietro Vesconte (fl. Venice, 1311-27). Particular elements in al-Ṭanjī's chart, such as his miniatures of Scandinavian fauna, might be inspired in Majorcan sources.

whereas al-Mursī and the Sharafīs seem to rely more on the Majorcans. In fact, al-Mursī's work displays clear signs of contact with the 1456 chart by Jaume Bertrán and Berenguer Ripoll made in Barcelona. This shows that he probably used a contemporary model from the workshop of one of these chartmakers.²⁴ However, some of the Majorcan distinctive features are conceptually derived and stylistically updated from al-Idrīsī's Geography and other Arabic sources. This is best illustrated by their depiction of the Atlas Mountains in North Africa,²⁵ which is adopted in al-Mursī's chart, and later in the richly ornamented Ottoman Turkish one of Ḥājj Abū l-Ḥasan (16th century).²⁶

The circulation of sea charts between the two shores of the Mediterranean favoured the mutual influence of Muslim and Christian chartmakers who, far from working in isolation, seem to have been aware of the trends and improvements of each cartographic tradition. Evidence is scarce on the quantity and characteristics of Majorcan charts that reached the Maghrebi and Levantine ports. At any rate, their distribution was favoured by the Arago-Catalan maritime expansion and trading network across the Mediterranean.²⁷ To what extent the emigrant Andalusians ever carried Majorcan charts with them to exile is open to speculation. Nonetheless, we know about Jahudā ben Zara, a Sephardic Jew of perhaps

²⁴ His source is identified by Herrera 2009. On Bertrán & Ripoll's chart, see Pujades 2007, C58, p. 261.

²⁵ Cf. Comes 2004, p. 543; and Y. Fall: *L'Afrique a la naissance de la cartographie moderne: Les cartes majorquines (XIV^e - XV^e siècles)*, Paris, 1982, p. 212ff. The Majorcan version of the Atlas Mountains is described by Sáenz 2007, pp. 394-400. In addition, Herrera 2009 discusses al-Idrīsī's influence on the Majorcan depiction of the rivers Guadalquivir and Segura. See also S. Brentjes: "Revisiting Catalan Portolan Charts: Do They Contain Elements of Asian Provenance?" In Ph. Forêt & A. Kaplony (eds): *The Journey of Maps and Images on the Silk Road*, Leiden, 2008 (forthcoming).

²⁶ This later chart shows many characteristic Majorcan features, and is preserved in Istanbul, Topkapi Library: Hazine 1822. See *MGC*, vol. 11, p. 33, vol. 12, fig. 38; Soucek 1992, p. 265, fig. 14.4.

²⁷ Already in 1354, King Pere the Ceremonious ordered all galleys under control of the Arago-Catalan Crown to have sea charts: cf. Comes 2004, p. 525. In addition, the merchant Domènec Pujol from Barcelona is known to have exported charts to Alexandria by the end of the 14th century: cf. Campbell 1987, p. 437. See also Pujades 2007 on the early production and trading of Majorcan charts.

Majorcan origin, who signed his three extant charts of Majorcan style in Alexandria and Safed between 1497 and 1505.²⁸

Given the fact that 15th-century Tunis had been the main commercial capital of central Maghreb, it is likely that sea charts and sailing instructions from around the Mediterranean were accessible to al-Ṭanjī. In the 16th century, the advent of the Ottoman rule in Tunisia (with the short interval of Spanish domination over Tunis and Goletta in 1573-74) should have created a positive atmosphere for the flow of cartography to and from Istanbul. In fact, al-Sharafī eventually copies from the atlas of al-Andalusī who lived in the Ottoman capital. It is also interesting to note that his 1551 atlas was acquired in Istanbul shortly before it was sent to the French royal library around 1739. Al-Ṭanjī and al-Mursī's charts are currently kept there.

5. The chartmaker Aḥmad al-Andalusī

In his 1571 atlas, al-Sharafī states to have consulted the sea charts of an atlas by an otherwise unknown Abū l-^cAbbās Aḥmad al-Andalusī, a resident of Istanbul. Whether this source was already used for his 1551 atlas is hard to determine. Neither can we say whether it contained additional material, such as calendars, a wind rose or a world map, comparable to al-Sharafī's second atlas, where we read:

وأما عمل البلاد والمراسي في البحر والأوراق المكتوبة [فيها البرّ الذي مبدؤه من زقاق سبّية إلى الشام وبرّ بحر الكفا فإني نقلت [ها] من طبلة رأيتها بخط بعض الساكنين بإصطنبول وهو الحكيم أبو العباس أحمد الأندلسي القاطن بها وهي غير الطبلة التي أعرف [ها] من شغل الوالد والجّد رحمهما الله تعالى وذلك لأنّها الموجودة عندي حين عملي لهذه.

As for coastal cities and harbours, they are presented on the charts (*al-awraq*, lit. pages) that show the lands extending from the Straits of Ceuta to Syria (Mediterranean Sea) and the lands of the Sea of al-Kafā (Black Sea). I have copied them from an atlas (*tabla*) made by an Istanbul resident, the learned Abū l-^cAbbās Aḥmad al-Andalusī, who had settled there. This atlas is different from the work (*shughl*) of my father

²⁸ See Campbell 1987, p. 436, fig. 19.18; C. Roth: "Judah Abenzara's Map of the Mediterranean World, 1500," *Studies in Bibliography and Booklore* 9 (1970), pp. 116-20; and M. Comes & M. Herrera, "Convivencia and chartmakers across the Mediterranean," 2009 (forthcoming). See also footnote 19.

and grandfather –may God have mercy upon them– but I used it as it was the only one I had with me while making (my atlas).

[1571 atlas, fol. 13r]

The name of Aḥmad al-Andalusī suggests that he might have been a *morisco*, or a descendant of a *morisco* family, who had settled in Istanbul, probably after the Ottoman conquest of the city in 1453. In fact, migration waves of *moriscos* towards the Islamic Mediterranean intensified after the fall of Islamic Granada in 1492, due to religious persecution in the Iberian Peninsula. Two 16th-century note-books provide detailed itineraries for the clandestine exile of *moriscos* on the way to Istanbul, with intermediate stops at Venice and Salonica.²⁹ Other *moriscos* reached Istanbul by crossing the Maghreb. By the early 16th century, a community of *moriscos* from Aragon, Valencia and Seville had established in Galata, the former Genoese colony of Pera across the Golden Horn.³⁰ They coexisted with a large Frankish population of diplomats, merchants and mariners whose presence certainly favoured intercultural exchange with the local ruling Ottomans.³¹ Whether al-Andalusī had truly settled in Galata or this was the place where other Andalusian chartmakers flourished remains in the dark.

In any event, Galata would have been a favourable enclave for the emergence of chartmaking, profiting from the maritime activities of the imperial Ottoman shipyard and arsenal.³² This can be inferred from Evliyā

²⁹ Cf. L. López-Baralt & A. Irizarry: “Dos itinerarios secretos de los moriscos del siglo XVI,” in *Homenaje a Alvaro Galmés de Fuentes*, Madrid, 1985, vol. 2, (pp. 547-82), 556, 558-59.

³⁰ Cf. Epalza 1992, pp. 283-84. The anonymous literary account *Viaje de Turquía* (mid-16th century) mentions them, but focuses on the Christian captives in Galata: see the edition by M.-S. Ortolá, Madrid, 2000, p. 765ff. (“Cómo cada día se huyen d’España moriscos y judíos”). According to *Seyāhatnāme* (vol. 1:2, p. 51), they used to gather at the so-called *mosque of the Arabs*, located at the former church of Saint Paul.

³¹ See *Seyāhatnāme*, vol. 1:2, p. 49ff.; and C. J. Heywood: “Gḥalāṭa,” *EF² Suppl.* 5-6 (1982); L. Mitler: “The Genoese in Galata: 1453-1682,” *International Journal of Middle East Studies* 10:1 (1979), pp. 71-91; E. Dursteler: “Neighbors: Venetians and Ottomans in Early Modern Galata.” In J. Helfers (ed.): *Multicultural Europe and Cultural Exchange*, Turnhout, 2005, pp. 33-47.

³² On both places, see *Seyāhatnāme*, vol. 1:2, p. 43ff.; besides the monograph by I. Bostan: *Osmanlı bahriye teşkilâtı: XVII. Yüzyılda tersâne-i âmire* [Ottoman Naval Organization: The Main Maritime Arsenal in the Seventeenth Century], Ankara, 1992.

Čelebi's (*Seyāhatnāme*) account of the Istanbul guild parade of 1638, which has sections on sailors of the Black Sea and the Mediterranean, as well as all kind of workers from the Galata shipyard. Among the latter, a group of chartmakers (*eṣnāf-i kharīṭaciyān*) is described as parading next to the compass (*eṣnāf-i puṣlaciṣyān*) and hour glass makers (*eṣnāf-i qum sāʿ atçiyān*).³³ They are said to have had eight map shops, with some fifteen active chartmakers, against the twenty-five shops of compass and hour glass makers. The latter two nautical devices apparently enjoyed a flourishing trade also in Galata.³⁴

II. THE ATLASES

6. Presentation

Al-Sharafī's oldest extant atlas is dated 1st Ramadan 958 H. (31st August / 1st September 1551 A.D.).³⁵ Its highly artistic execution as a work of art indicates that by that time al-Sharafī had already been a qualified chartmaker (figs. 1, 3). His other atlas is an extended functional version, with a larger set of additional material and textual instructions, but less

³³ Here, the Turkish term *eṣnāf* should be interpreted as profession, rather than an organized guild: cf. E. Yi: *Guild Dynamics in Seventeenth-Century Istanbul: Fluidity and Leverage*, Leiden, 2004, p. 46. The relevant passage is in *Seyāhatnāme*, vol. 1:2, pp. 131-32 (also translated by Soucek 1992, p. 284; *idem* 1996, pp. 93-94). Unfortunately, chartmakers are not mentioned in the account of *Sūrnāme-i Hümāyūn* (edited by G. Procházka, Istanbul, 1995) of the 1582 imperial circumcision festival in which seamanship professions already paraded.

³⁴ Cf. *Seyāhatnāme*, vol. 1:2, pp. 53, 131-32.

³⁵ Colour pictures of the whole atlas are to be found in *Itinéraire du savoir en Tunisie* (commentary by M. Chapoutot: "Les Charfī et la cartographie," pp. 84-95 with some inaccuracies). Pages of this atlas often appear in publications of the Bibliothèque nationale de France, such as *L'Art du livre arabe: Du manuscrit au livre d'artiste* (Paris, 2001), p. 127 (scheme of sacred geography) and *La mer: Terreur et fascination* (Paris, 2004), p. 23 (world map). See also E. Blochet: "Contribution à l'étude de la cartographie chez les musulmans," *Bulletin de l'Académie d'Hippone* 29 (1898), (pp. 1-27) 15-18; and *Mappae arabicae*, vol. 5, pp. 150, 154-55 (with sketches of the world map and the scheme of sacred geography) and vol. 6 (1927), pl. 78-80.

decoration (figs. 2, 4).³⁶ This second work is dated at the end of *jumādā al-ukhrā* 979 H. (late November 1571), some weeks after the Ottoman defeat at the naval battle of Lepanto (October 7th). In fact, it omits Lepanto from the sequence of coastal place names, in contrast to the first atlas in which it appears with the Ottoman Turkish designation *Aynabakhtī**, apparently written in al-Sharafī's hand.³⁷ He either overlooked it or omitted it on purpose in the second atlas, in which case this would acquire a political significance.

The atlases show distinctive ornamental features based on the colour red, and frames and medallions of intertwined knots. These are also peculiar to the sea charts of al-Sharafī and his son, as well as the earlier ones of al-Ṭanjī and al-Mursī, which are all framed by a pattern of such knots.³⁸ This type of design is widely documented in Islamic art and manuscript illumination, especially in Qurans from al-Andalus and the Maghreb. Both al-Sharafī's atlases, mainly the first one, are often displayed as visual icons of Islamic cartography, similarly to other emblematic works within the context of Majorcan, Venetian and Ottoman chartmaking.

³⁶ Two rather problematic translations of this atlas are available by W. Brice (Manchester, ca. 1981, unpublished) and M. Mansouri ("Une famille de cartographes tunisiens: Les Sharfī," in H. Akkari (ed.): *La Méditerranée médiévale: Perceptions et représentations*, Paris/Tunis, 2002, pp. 263-77). The latter translation omits the last two pages of the text, and all the tables and cartography of the atlas. Some of Brice's sketches of the cartography (world map, scheme of sacred geography and chart of the Iberian Peninsula) and the table of lunar mansions are reproduced in the guard leaves of the *Atlas of Islam* (1981 & 2001). In addition, the Arabic *incipit* and colophons are edited by A. al-Ghunaym: *Arabic Geographic Manuscripts at the Bodleian Library*, Oxford, 2006, pp. 298-300. Pinna 1996, vol. 2, pp. 140-61 (with superb colour pictures) deals with the chart of the west central Mediterranean in both atlases.

³⁷ The asterisk (*) denotes the toponyms written in red ink. See the description of Lepanto in *Bahrīye*, vol. 2, fols. 157r-158v, and fig. in p. 681; F. Babinger: "Aynabakhtī," *EF* 1 (1960). It is registered with the name Lepanto in Majorcan and Venetian sea charts: cf. Kretschmer 1909, p. 634.

³⁸ On the knotted decoration of Maghrebi and Ottoman sea charts, see Herrera 2008, p. 286. D. King: "An Astrolabe from 14th-Century Christian Spain with Inscriptions in Latin, Hebrew and Arabic: A Unique Testimonial to an Intercultural Encounter," *Suḥayl* 3 (2002-03), pp. 9-156 draws attention to the knots engraved on Islamic astronomical instruments; he mentions al-Sharafī's atlases on pp. 98-101.

Who were the atlases made for?

Mediterranean nautical cartography is expected to have had a practical utility, that is, to have been used as a navigational guide for sea captains on board ship. However, the stylish decoration and artistry of most surviving Maghrebi, Majorcan and Venetian examples, sometimes with elements in golden ink (for instance, al-Ṭanjī and al-Mursī's works) suggest that such pieces had been more likely intended for private collectors and armchair scholars with a general knowledge on geography and navigation. Al-Sharafi's atlases, in particular the visually striking 1551 version, fit into this category. This kind of public also explains the nature of the Sharafi's sea charts of the world, partly based on al-Idrīsī's Geography, still at the turn of the 17th century.

In any event, both al-Sharafi's atlases show traces of having been used by Ottoman readers. The 1551 atlas has added place names as well as the names of the eight main winds, all written in Ottoman Turkish by a different hand than al-Sharafi's, on the charts of the Aegean and the Black Sea. In the 1571 version, the island of Sardinia is likewise labelled (Sardāniya) by a Turkish Ottoman hand on the chart of the west central Mediterranean.

7. Codicological description

The 1551 atlas is preserved in the Bibliothèque nationale de France, Paris (MS arabe 2278, 8 fols.). The catalogue of the old royal library, states that it was acquired in Istanbul, perhaps by a French cultural expedition, shortly before 1739.³⁹ Its excellent condition reinforces the idea that it was a luxury book. This atlas is made entirely of paper paste folios (24.5 × 20 cm), with the inside of the binding covered in Turkish marbled paper.

The 1571 atlas entered the Bodleian Library, Oxford (MS Marsh 294, originally 14 fols.) around 1697, as part of the manuscript collection of the

³⁹ Cf. A. Melot: *Catalogus codicum manuscriptorum Bibliothecae Regiae, pars prima*, Paris, 1739, p. 189 (no. 847). See also W. de Slane: *Catalogue des manuscrits arabes de la Bibliothèque Nationale*, Paris, 1883 (1st fasc.), p. 399. Several unidentified *geographies* are recorded among the manuscripts acquired by the 17th-century French expeditions to the Levant. See the inventories collected by H. Omont: *Missions archéologiques françaises en Orient aux XVII^e et XVIII^e siècles*, Paris, 1902, 2 vols.

Dublin archbishop Narcissus Marsh.⁴⁰ The atlas is in a fragile condition indicating that it was heavily used, though not necessarily on a boat. One folio that contained a scheme of moon phases and a calendrical table is missing. The sectional sea charts are drawn on paper paste folios while the rest is written on European paper with a watermark (size 27 × 21 cm).

The French orientalist Jean Gagnier (ca. 1670-1740),⁴¹ working at the Bodleian, translated al-Sharafi's authorship inscription into Latin on the front page of the atlas (fig. 2). He also added the Holy Land place names *Ascalon*, *Jafa*, *Acco*, *Tyrus* and *Said* on the chart of the Levant, as well as scattered notations on other folios. His interest in al-Sharafi's atlas encouraged him to make his own copies of the scheme of sacred geography, the world map and the wind rose. These are collected in a manuscript miscellanea of Gagnier's writings on geography (Oxford, Bodleian Library: MS Or. 304, fols. 1-3).⁴²

⁴⁰ Cf. E. Bernard: *Catalogi librorum manuscriptorum angliae et hiberniae in unum collecti*, Oxford, 1697, vol. 2, part 2, p. 54 (no. 1169). See also Nicoll 1821, p. 602; J. Uri: *Bibliothecae Bodleianae codicum manuscriptorum orientalium... Pars prima*. Oxford, 1787, pp. 202-03 (no. 935).

⁴¹ See M. J. Franklin: "Gagnier, John," in L. Goldman (ed.): *Oxford Dictionary of National Biography*, Oxford, 2008 (electronic version at <<http://www.oxforddnb.com/>>).

⁴² See Nicoll 1821, p. 233 (MS Arab. Moh. 266).

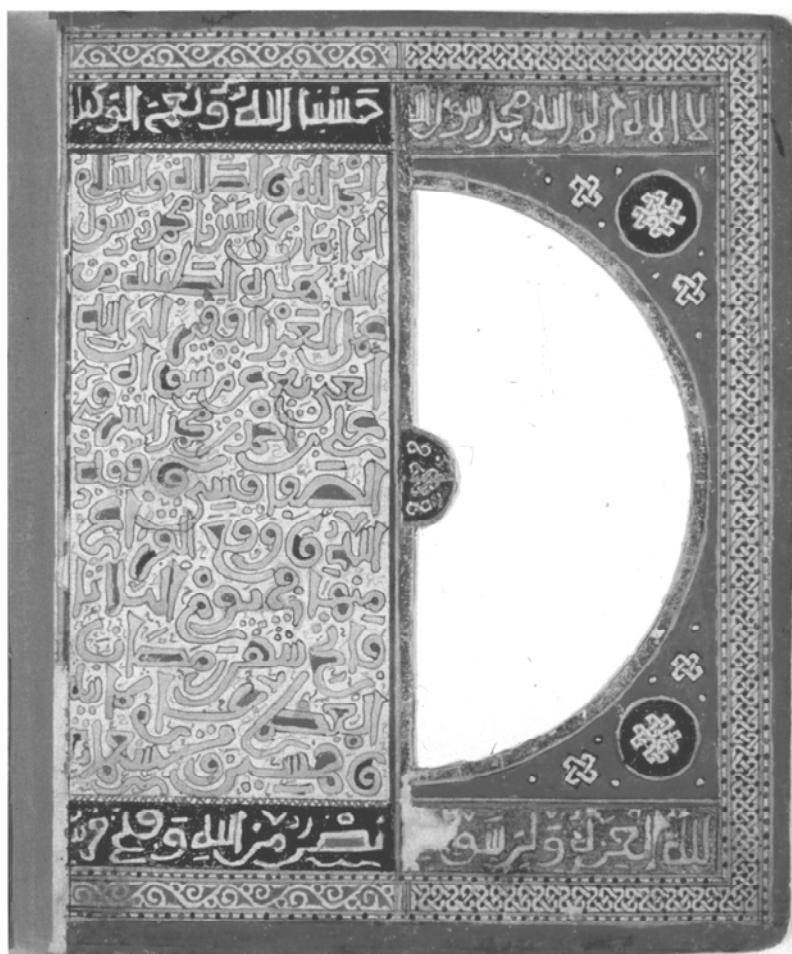


Fig. 1: AL-SHARAFĪ'S 1551 ATLAS

Front page with authorship and dating inscription (fol. 1v).

Courtesy of the Bibliothèque nationale de France, Paris (MS arabe 2278).

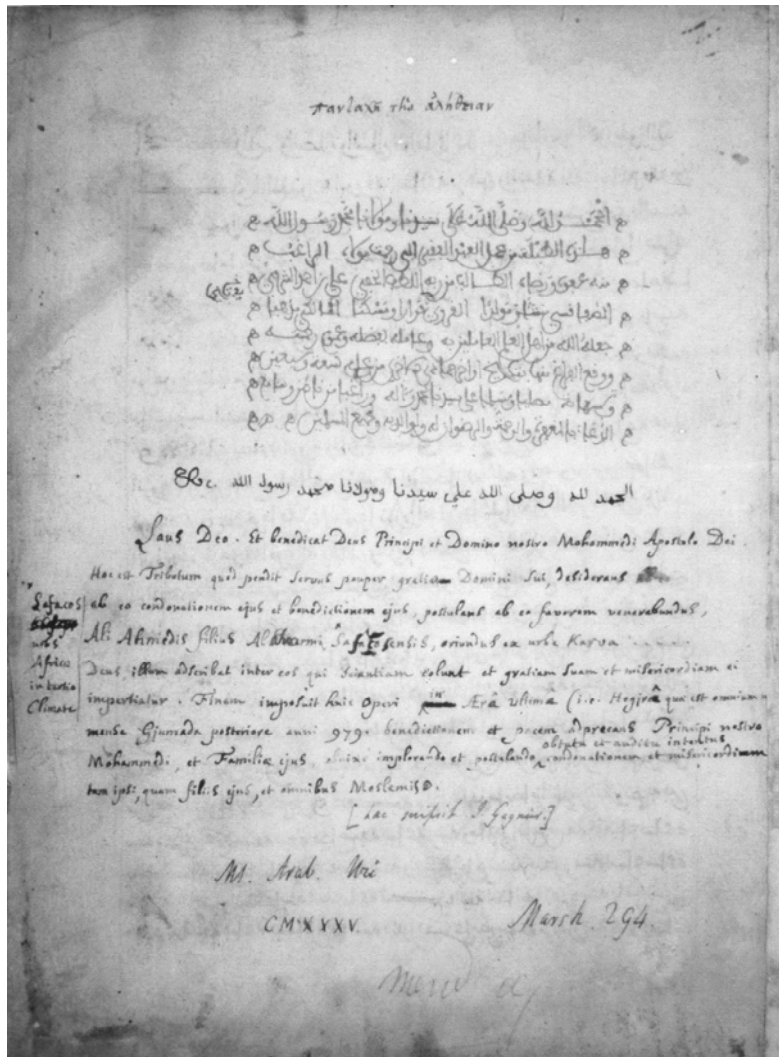


Fig. 2: AL-SHARAFĪ'S 1571 ATLAS
 Front page with authorship and dating inscription (fol. 1r).
 Courtesy of the Bodleian Library, Oxford (MS Marsh 294).

8. Terminology: *al-ṭabla*

Al-Sharafī designates his own atlases, and that of al-Andalusī, with the term *al-ṭabla*. An inscription on his 1579 sea chart of the world also calls it *al-ṭabla*, though al-Sharafī generally denotes this kind of map as *jughrāfiyā*.⁴³ The word as such exists in classical Arabic, perhaps derived from the Greek τὰβλα (writing support; drum), reaching the Arabs through Middle Persian.⁴⁴ Its use by al-Sharafī attests to its value as a technical term within the context of Maghrebi chartmaking. Here *ṭabla* is contaminated by the Medieval Latin *tabula*, which designates both an atlas and a map, including a sea chart. The Latin word was equally applied to the *Tabula Amalfitana*, one of the oldest compendia of Mediterranean maritime law, still effective till the late 16th century.⁴⁵

In 14th-century Majorca, the so-called *taules de navegar* (*Lat. tabulas navigandi*) are none other than *mappaemundi* or *navigational charts* which have been copied onto more than one piece of vellum... and pasted onto wooden panels (often each chart onto two panels that could be folded together to keep the map safely inside).⁴⁶ This kind of format, which characterizes the *Catalan Atlas*, became popular among Majorcan chartmakers of the period. In Venice, the influential Pietro Vesconte (fl. 1311-27) also named his atlases, mounted on wooden panels, as *tabula(s)*, so that he could distinguish them from his parchment charts, which he

⁴³ *Lo scrittore di queste righe ed autore di questa tavola (al-ṭabla) dice: Ciò è riferito dall'autore del Nuzhat al-mushtāq...: cf. Nallino 1944, pp. 535-36, 540. See footnote 15.*

⁴⁴ See K. Lokotsch: *Etymologisches Wörterbuch der europäischen (germanischen, romanischen und Slavischen) Wörter orientalischen Ursprungs*, Heidelberg, 1927, p. 156 (no. 1971). On the meaning of *ṭabla* as a drum, see H. Farmer: “*Ṣandj*,” *EF* 9 (1997), p. 11; *idem*: “*Ṭabl*” and “*Ṭabl-Khāna*,” both in *EF* 10 (2000). For other meanings: *Supplément*, vol. 2, pp. 26-27; *Lexicon*, vol. 5, p. 1828; and M. A. Cherbonneau: “*Définition lexicographique de plusieurs mots usités dans le langage de l’Afrique septentrionale*,” *Journal Asiatique* 13 (1849), (pp. 63-70, 537-51) 545 (*planchette longue et fendue à une de ses extrémités, dont se servent les brodeurs pour maintenir leur ouvrage*).

⁴⁵ Other meanings in Medieval Latin are collected by Du Cange (C. du Fresne): *Glossarium mediae et infimae latinitatis* (Paris, 1678). Reissued by L. Favre, Niort, 1883-87 (10 vols.), vol. 8, pp. 4-8ff.; in which *tabula portus / tabula maris* refers to a mid 13th-century register of coastal localities for tax purposes.

⁴⁶ Cf. Pujades 2007, p. 109 (see also pp. 112-13).

called *carta(s)*.⁴⁷ According to this, the meaning of *tabla / tabula* suggests a specific connection with the writing support on which the atlases were made, either on wooden panels or paper paste folios, as in the case of al-Sharafī's atlases. The latter were bound in book format, as was often the practice for 16th-century European and Ottoman atlases, for instance Pīrī Re'īs' *Bahrīye* (*Book on sailing instructions*, first version 1521 and second version 1526).⁴⁸

9. Contents and composition

The core of al-Sharafī's atlases comprises a set of sectional sea charts of the Mediterranean and the Black Sea, which confers the nautical character to the works. Only the second atlas incorporates a separate wind rose with the names and directions of the thirty-two navigational winds. The charts are introduced by a medieval cartography which describes a picture of the universe in descending order from the celestial spheres to the Earth, before focusing on the Mediterranean space. In the second larger atlas, this consists of:

1. A cosmological scheme derived from al-Jaghmīnī's treatise on the fundamentals of theoretical astronomy (*Al-Mulakhkhaṣ fī l-hay'a al-basīṭa*, comp. 1221-22).⁴⁹ This was originally preceded by a scheme of the phases of the moon which is now missing. Both elements are omitted in the first atlas.
2. A scheme of Islamic sacred geography to be used for the determination of the *qibla* or sacred direction towards the Ka^cba in Mecca.⁵⁰ This kind

⁴⁷ Cf. Campbell 1987, p. 376. This terminology is used in Vesconte's authorship inscriptions: see *Cartes nautiques sur vélin*, p. 10 (1313 atlas); and Kretschmer 1909, pp. 111-12, 116-17 (1313, 1318 and 1321 atlases).

⁴⁸ Some European examples are described by Astengo 2007, pp. 183-85. See also Soucek's (1996, p. 108ff.) detailed codicological description of the late 17th-century Ottoman Turkish atlas from the Khalili collection.

⁴⁹ See the translation by G. Rudloff & A. Hochheim: "Die Astronomie des Maḥmūd ibn Muḥammed ibn 'Omar al-Ġagmīnī," *Zeitschrift der Deutschen Morgenländischen Gesellschaft* 47 (1893), pp. 213-75; also S. P. Ragep: "al-Jaghmīnī," in Th. Hockey *et al.* (eds.): *Biographical Encyclopedia of Astronomers*, New York, 2007, vol. 2, pp. 584-85.

⁵⁰ For sketches of the schemes, see *Mappae arabicae*, vol. 5, pp. 154-55 (atlas 1551) and one of the guard leaves of the *Atlas of Islam* (atlas 1571). A colour picture of the scheme in the

of geography involves a notion of the Kaʿba as the centre of the world. In both atlases, the scheme is inscribed on a wind rose which hints at the adjustment of this distinctive nautical device to the service of Islamic rituals in the Mediterranean.

3. A circular world map that al-Sharafī says to have drawn from al-Idrīsī’s Geography, one of his chief authorities.⁵¹ Only in the second atlas, this is accompanied by a description of the shape of the Earth and the seas, which is again an almost literal copy of the introduction to al-Idrīsī’s text.⁵² This information is summarized in the inscriptions of the sea charts of the world by al-Sharafī and his son.

Further calendrical and folk astronomical material is inserted at the beginning and the end of each atlas (before and after the cartography). This includes a calendar of lunar mansions, a monthly almanac and data on shadow lengths in the 1551 atlas, in which they appear in a smart tabular presentation of didactic purposes.⁵³ To these, the 1571 version

first atlas is in *The History of Cartography*, vol. 2:1 (1992), pl. 13. D. King (*World-Maps for Finding the Direction and Distance to Mecca: Innovation and Tradition in Islamic Science*, London/Leiden, 1999) mentions both on pp. 52, 54, fig. 2.3.4; and in his article “Makka (4. As the Centre of the World),” *EF* 6 (1991). This author has published extensively on folk and mathematical aspects of Islamic sacred geography, see *idem* (& R. Lorch): “Qibla Charts, Qibla Maps, and Related Instruments,” in *The History of Cartography*, vol. 2:1 (1992), pp. 189-205; *idem*: “The Sacred Geography of Islam.” In T. Koetsier & L. Bergmans (eds.): *Mathematics and the Divine: A Historical Study*, Amsterdam (etc.), 2005, pp. 161-78.

⁵¹ This appears at the beginning of some manuscripts of al-Idrīsī’s Geography, see Maqbul 1992, pp. 160ff., 173ff. (appendix), and figs. 7.1-7.5, 7.21, pl. 11. However, some scholars claim that al-Idrīsī’s world map is derived from an archetype in the *Book of Curiosities* (*Kitāb Gharāʾib al-funūn wa-mulaḥ al-ʿuyūn*, comp. Egypt ca. 1050), which is only extant in a 13th-century copy: cf. J. Johns & E. Savage: “The *Book of Curiosities*: A Newly Discovered Series of Islamic Maps,” *Imago Mundi* 55 (2003), (pp. 7-24), 13-14, pl. 3.

⁵² See al-Idrīsī: *Opus geographicum* (Arabic edition), Naples/Rome, 1970-84, fasc. 1, pp. 3-14; and *Géographie d’Edrisi*. Translation by P. A. Jaubert, Paris, 1836-40, vol. 1, pp. 1-9 (revised by A. Nef & H. Bresc: Paris, 1999).

⁵³ On tables as part of the visual language of science, see E. Savage: “Ibn Baklarish in the Arabic Tradition of Synonymatic Texts and Tabular Presentations.” In Ch. Burnett (ed.): *Ibn Baklarish’s Book of Simples: Medical Remedies between Three Faiths in Twelfth-Century Spain*, Oxford, 2008, pp. 113-32.

adds other calendrical tables for finding the day of the week in which the Arab and non-Arab (Julian) years begin (see below the contents of each atlas). Contrary to the first one, all the additional material in this atlas is presented in a functional format, with appended textual instructions. The calendars of lunar mansions in both atlases are a distinctive element of the Maghrebi nautical cartography. Three other such calendars appear in a wheel shape in the charts of al-Ṭanjī and al-Mursī, as well as the Ottoman Turkish one of Ḥājj Abū l-Ḥasan. These sources situate the lunar mansions in a navigational context, but provide no definite evidence of their practical use, perhaps as chronological indicators, by Muslim sea captains of the Mediterranean. The choice of calendrical and astronomical material that is also recorded in luxurious nautical atlases from Majorca and Venice has not yet been fully surveyed.⁵⁴ This poses difficulties for comparative research with al-Sharafī's atlases. Of especial interest is the *Catalan Atlas* (ca. 1375) which already shows a sumptuous cosmological scheme with both the lunar mansions and the moon phases, besides outer calendrical rings for the computation of the Julian year.⁵⁵

The similar contents and structure of al-Sharafī's atlases suggests a professional systematic method for their composition. Actually, he seems to have worked with a set of cartographic models that could be combined each time with different additional material at market demand. Such a practice would have favoured a regular production of other comparable atlases for a period possibly longer than the twenty years separating the two extant examples.

⁵⁴ See some remarks in Campbell 1987, pp. 446-48 and Pujades 2007, pp. 177-78.

⁵⁵ See *L'Atlas Català* (fol. II), with a study by J. Samsó in vol. 1, pp. 44-56 (quoted as Samsó 2005 in the final bibliography).

Table of contents of the 1551 atlas⁵⁶

Foliation	Contents
fol. 1v	Front page with authorship and dating inscription
fol. 2r	(T1) Calendrical table of lunar mansions
fol. 2v	Scheme of sacred geography (oriented southwards)
fol. 3r	Circular world map (oriented southwards)
fol. 3v	(C1) Sea chart of the Iberian Peninsula and the western Maghreb (oriented southwards)
fol. 4r	(C2) Sea chart of the west central Mediterranean (oriented southwards)
fol. 4v	(C3) Sea chart of Italy and the Adriatic Sea (oriented southwards)
fol. 5r	(C4) Sea chart of the Black Sea (with the North black arrow mistakenly pointing eastwards)
fol. 5v	(C5) Sea chart of the eastern Mediterranean (oriented northwards)
fol. 6r	(C6) Sea chart of the Aegean Sea and the east central Mediterranean (oriented northwards)
fol. 6v	(C7) Sea chart of the central Maghreb with Sicily (oriented northwards)
fol. 7r	Circular table of shadow lengths
fol. 7v	(T2) Monthly almanac (January – June)
fol. 8r	(T2) Monthly almanac (July – December). Colophon

Table of contents of the 1571 atlas

Foliation	Contents
fol. 1r	Front page with authorship and dating inscription
fol. 1v	Instructions for T1 and T2 Instructions for the scheme of moon phases (fols. 1v–2r)
fol. 2r	Description of the scheme of cosmology Instructions for the scheme of sacred geography Description of the nautical wind rose
fols. 2v–3r	Description of the shape of the Earth and the seas
fol. 3r	Definition of sea chart of the world. First colophon

⁵⁶ Abbreviations: T = table; C = sectional sea chart.

fol. 3v	(T1) First calendrical table for finding the weekday in which the Arab months and years begin
missing folio	[(T2) Second calendrical table of Arab months and years] [Scheme of the phases of the moon]
fol. 4r	Scheme of cosmology (oriented southwards)
fol. 4v	Scheme of sacred geography (oriented southwards)
fol. 5r	Nautical wind rose of 32 directions (oriented southwards)
fol. 5v	Circular world map (oriented southwards)
fol. 6r	(C1) Sea chart of the central Maghreb with Sicily (oriented southwards)
fol. 6v	(C2) Sea chart of Italy and the Adriatic Sea (oriented southwards)
fol. 7r	(C3) Sea chart of the Iberian Peninsula and the western Maghreb (oriented southwards)
fol. 7v	(C4) Sea chart of the west central Mediterranean (oriented southwards)
fol. 8r	(C5) Sea chart of the Aegean Sea and the east central Mediterranean (oriented southwards)
fol. 8v	(C6) Sea chart of the Black Sea (oriented westwards)
fol. 9r	(C7) Sea chart of the eastern Mediterranean (oriented southwards)
fol. 9v	(T3) Calendrical table of lunar mansions
fol. 10r	(T4) Calendrical table for finding the weekday in which the non-Arab (Julian) months and years begin
fol. 10v	(T5) Table of shadow lengths
fol. 11r	blank page
fol. 11v	Instructions for T3 and T4 (fols. 11v–12r)
fol. 12r	(T5) Instructions for T5
fol. 12v	Description of the Mediterranean and the Atlantic
fol. 13r	List of sources. Second colophon

III. THE SECTIONAL CHARTS

10. Geographical distribution and coastline layout

Al-Sharāfī's atlases offer an almost identical set of seven small sea charts of the Mediterranean and the Black Sea. Most of them, especially in the 1551 atlas, are correlatively organized in facing pages, oriented southwards. They focus on the profile of the coastline and, except for the miniature of a pomegranate representing Granada, and a sketchy image of Venice (this only in the second atlas),⁵⁷ the inland territories are left empty. Six charts cover different sections of the Mediterranean, from the Atlantic shores of the Iberian Peninsula and the Maghreb as far as the Levant, and one chart of a smaller scale is dedicated to the Black Sea (see their arrangement in the tables of contents of each atlas). The Iberian Peninsula is divided between two charts, as the section of coastline comprising Valencia and Catalonia (besides the Balearic Islands) is included in the chart of the west central Mediterranean (figs. 3, 4). The latter shows the Catalan coastline from Dénia (Dāniya*) to Cap d'Aiguafreda (Qāb dī-Kūfrādā) in the first atlas, and to Barcelona (Barshinūna*) in the second; in addition to the French and northwest Italian coastlines as far as Piombino (Blubīn*).

The geographical distribution and coastline layout of the charts is analogous in both atlases and probably derived from a common model or master copy. The shape of mainland coastlines was transferred from this model by means of a dry point technique which is well attested in Mediterranean nautical cartography (for example, in Gabriel de Vallseca's 1439 chart)⁵⁸ and described in detail in the Spanish nautical treatise of Martín Cortés (1551).⁵⁹ All islands are drawn freehand. The profile of the coastline in the 1571 atlas is carelessly, even exaggeratedly, distorted in

⁵⁷ Venice is the most frequently depicted city in Mediterranean nautical cartography. Herrera 2008, p. 292 studies the emblem of Venice in al-Ṭanjī's chart (compared with Albertin de Virga's 1409 chart), and Herrera 2009 in al-Mursī's (compared with Bertrán & Ripoll's 1456 chart). See Sáenz 2007, p. 453ff. for Majorcan and Italian examples.

⁵⁸ I am grateful to Olga López (Museu Marítim, Barcelona) who allowed my access to the original chart. See footnote 16.

⁵⁹ See M. Cortés Albácar: *Breve compendio de la esfera y del arte de navegar*. Edition by M. Cuesta Domingo, Madrid, 1990, pp. 217-19. The technique is discussed by Campbell 1987, p. 391 and Pujades 2007, p. 212ff.

some regions. This is obvious in the Atlantic shore of the Iberian Peninsula, extending from Cape Finisterre to the Bay of Cadiz and the Straits of Gibraltar. Other problematic regions in the same atlas are the Aegean seashores and the Peloponnese Peninsula, where prominent Cape Matapan (named Māniya in the first atlas) is missing altogether. The main Mediterranean islands, such as Sicily, Corsica and Sardinia, are also visibly deformed.

11. Coastal place names

Apart from the more accurate coastline layout, the place name density is also higher in the 1551 atlas, which provides almost seven hundred labels, about a hundred more than the 1571 atlas. The significant toponymic variants recorded between them can be explained by a different combination of sources in each atlas, besides writing economy in the second functional version. In order to accommodate a higher number of place names, these were written in smaller size in the first atlas.

In all Maghrebi chartmaking, including al-Sharafī's atlases, place names were apparently inserted (and were to be read) starting in the western Maghreb, to proceed around the Mediterranean coastline and end up in the Iberian Peninsula or further north Atlantic, that is, in a counter-clockwise direction when the charts are oriented northwards. This pattern is equally observed in the work of Ḥājj Abū l-Ḥasan. The presentation of the charts in Pīrī Re'īs' Ottoman Turkish *Baḥrīye* (1526) also maintains a counter-clockwise arrangement around the Mediterranean, though starting at the Dardanelles.⁶⁰ This distinctive feature might have originated in the traditionally southward orientation of Islamic cartography, and is coincidental with the Arabic geographies of al-Bakrī (d. 1094), al-Idrīsī (fl. 1154) and Ibn Sa'īd (1213-86) which in the Maghreb describe coastal itineraries from West to East.⁶¹ Indeed, the regional maps of al-Idrīsī's Geography were already presented in this order.⁶² We find the opposite in Majorcan and Venetian chartmaking where place names were to be read

⁶⁰ Cf. Soucek 1992, p. 275. This is explained in *Baḥrīye*, vol. 2, fol. 139r.

⁶¹ Some of these itineraries are examined by T. Lewicki: "Les voies maritimes de la méditerranée dans le haut Moyen Age d'après les sources arabes," in *La navigazione mediterranea nell'Alto Medioevo*, Spoleto, 1978, vol. 2, pp. 439-80.

⁶² See footnote 11.

in a clockwise direction, starting north and ending south in the western Maghreb (with the charts oriented northwards).

11.1. In the Islamic Mediterranean

The sequence of Arabic coastal place names in al-Sharafī's atlases is mostly attested in the 15th-century charts of al-Ṭanjī and al-Mursī, though no direct connection can be established between them. They all offer an exhaustive toponymic coverage of the Islamic Mediterranean which is one of the main contributions of Maghrebi chartmakers to nautical cartography. The compilation of such data probably benefited from the earlier tradition of Arabic geography, but perhaps also from first hand knowledge of the Islamic seafaring folklore in the Mediterranean. As we have seen, al-Sharafī states to have used his father and grandfather's production, as well as al-Andalusī's atlas (comp. before 1571). Nonetheless, he might have had further knowledge of Maghrebi and Andalusian chartmaking. No other Arabic cartographic source is mentioned, except for the medieval maps of al-Idrīsī's Geography.

Al-Sharafī's collection of Arabic place names is less comprehensive than that of his counterparts al-Ṭanjī and al-Mursī in all the Islamic Mediterranean, that is, in North Africa, particularly in the seashores between Tripoli and Alexandria, in addition to the Levant and the Iberian Peninsula. Still, he shows a special concern for coastal hydrology, meaning river mouths and water sources; for instance, in the western Maghreb. He also provides many place names for minor localities (including a few tribal settlements) and physical geography (primarily capes and deltas) which are rarely attested, and possibly unknown, in Majorcan and Venetian sea charts. In fact, Islamic regions habitually afar from the maritime trading routes of European vessels, such as the Gulf of Sirte and Marmarica, were accordingly furnished with lesser details in their cartographies.

The Arabic place names in red ink for capital cities and major geographical landforms are generally repeated in al-Ṭanjī and al-Mursī's charts, as well as al-Sharafī's atlases. In North Africa, the latter records almost fifty such names for the section of coastline between Ceuta and Alexandria, which are the following: Sabta* (Ceuta), Targha*, Bādis* (Rock of Vélez de la Gomera), Khaṣāṣa*, Malīla* (Melilla), Mulūya*, Hunayn* (not Ḥunayn), Wāhrān* (Oran), Mustaghānim*, Tanas*, Brishk* (Biskra), Sharshāl* (Cherchell, in red ink only in the first atlas),

al-Jazā'ir* (Algiers), Tadallīs* (Dellys), Bijāya* (Bougie), Jjil* (Jijelli), al-Qull* (Collo), Ustūra* (Stora), Būna* (Annaba), Ṭabarqa* (Tabarca), Jāliṭa* (La Galite), Binzart* (Bizerta), Tūnis* (Tunis), Iqlībiya* (Kelibia), jūn al-Madfūn* (in the Gulf of Hammamet, only in the second atlas), Ihrīqliya* (Hergla), Sūsa* (Sousse), al-Mahdīya*, Ṣafāqus* (Sfax), Qarqana* (Kerkenen), Qābis* (Gabes), Jarba* (Jerba), Zuwāgha* (in red ink only in the first atlas), Iṭrābulus* (Tripoli), Tājūra*, Labda* (Lebda), Mīsrāta* (Misurata), ra's Surt* (only in the second atlas), Namārish*, al-Bayḍā'* (in red ink only in the first atlas), Zināra*, Birnīq* (Benghazi), Ṭulmayta* (Ptolemais), (ra's) ʿAbdūn* (in red ink only in the second atlas), ra's Awtān* (Cape Sem), (ra's) al-Hilāl*, ra's al-Tīn*, Ṭubruq* (Tobruk), Lukka*, ra's al-Milāḥ* (ra's al-Milḥ), al-Ṭarqāwī* (in red ink only in the first atlas), ra's juzur al-Ḥamām*, ra's al-Kanā'is*, Iskandarīya* (Alexandria).

Al-Sharafī maintains conventional Arabic place names in the Iberian Peninsula, above all in Andalusia, which can be interpreted as a sign of conservatism, and perhaps also as a political statement. There we still find Burtuqāl* (Oporto), Ṭarf al-Gharb (Cape São Vicente), Ishbīliya* (Seville), Jabal al-Faṭḥ* (Gibraltar, only in the first atlas), al-Jazīrat al-Khaḍrā'* (Algeciras) or al-Munakkab* (Almuñécar), among others. However, he transliterates the Catalan form of distinctive toponyms, sometimes of Arabic origin, in the seashores of Valencia and Catalonia, such as al-Buḥīrā (l'Albufera, from Ar. *al-buḥayra*), qāb Larkūdrā (Cap d'Alcodra, Cap de l'Horta), qāb di-Lalūyub (Cap de l'Aljup) and qāb dī-Kūfrādā / dī-Kwafrādā (Cap d'Aiguafreda).⁶³ These examples, probably copied from a Majorcan source, are unrecorded in the earlier anonymous Maghreb Chart (ca. 1325-50).⁶⁴ In the Iberian Peninsula, the latter provides a similar number of place names as al-Sharafī, but stays closer to the Arabic tradition.

⁶³ See R. Pujades: "La toponímia litoral del País Valencià en la cartografia portolana medieval," in *Congrés internacional de toponímia i onomàstica catalanes* (Valencia 2001), Valencia, 2002, (pp. 357-74) 363, 368, 369; and Rosselló 2004, pp. 311-12 (Cap de l'Aljup). They are also listed by Kretschmer 1909, pp. 584-85, 588. See footnote 69.

⁶⁴ Vernet 1962 offers a complete transliteration and identification of place names in the Maghreb Chart (these are collected by Pinna 1996, vol. 2, p. 118ff.). See also the earlier work by T. Fischer: "Die arabische Seekarte der Ambrosiana," *Sammlung mittelalterlicher Welt- und Seekarten. Italienischen Ursprungs und aus italienischen Bibliotheken und Archiven*. Venice, 1886, pp. 219-45 (repr. Amsterdam, 1961).

As for the Aegean region (including the Balkan shore), which in the 16th century was exposed to Ottoman rule, al-Sharafī's data is mainly derived from a European (Majorcan) chart (see the comparative table below). Here, significant variants are observed between al-Sharafī and Pīrī Re'īs, whose *Baḥrīye* logically favours Ottoman Turkish place names not only in the Aegean, but also in Mediterranean Anatolia, even when describing the location of Venetian and Genoese enclaves.⁶⁵ Nevertheless, al-Sharafī incorporates al-Būghāz* which is the Ottoman Turkish designation for the Dardanelles, also used by Pīrī Re'īs.⁶⁶ Another example of Ottoman Turkish influence is Aynabakhtī* for Lepanto, which is only included in the first atlas. If these were copied from the atlas of al-Andalusī, who lived in Istanbul, the latter would have been al-Sharafī's source since 1551. As for the name of the Ottoman capital, al-Sharafī records Iṣṭānbūl*, the location of which is highlighted with a prominent flag. The first atlas adds the European designation Bīrā* (Pera) for nearby Galata. Both Iṣṭānbūl* and Bīrā* (but not al-Būghāz) are attested in al-Mursī's chart, composed almost a decade after the Ottoman conquest of the city (1453). Despite this historical fact, the name Constantinople remained in vogue in Majorcan and Venetian nautical cartography long after this date.⁶⁷

11.2. In Mediterranean Europe and the Black Sea

In al-Sharafī's atlases, place names and geographical terminology for the most part of Mediterranean Europe and the Black Sea are systematically derived from a European, most probably Majorcan rather than Venetian, source. Indeed, a detailed comparison of al-Sharafī's sequence of coastal place names with that of the more comprehensive *Estense World Map* (mid-15th century) reveals frequent coincidence in both areas. This affinity suggests influence from the Majorcan chart initially used by al-Sharafī's grandfather for his sea chart of the world. At this stage, it cannot be determined whether al-Sharafī consulted this or another Majorcan model,

⁶⁵ See *Baḥrīye*, vols. 1-2. On Pīrī Re'īs' sources, see Soucek 1992, pp. 277-79.

⁶⁶ See *Baḥrīye*, vol. 1, fol. 43v ff.; and V. Parry: "Boghaz-içi," *EF* 1 (1960); *idem*: "Çanağ-çale Boghazi," *EF* 2 (1965), the latter with a reference to sea charts.

⁶⁷ Cf. Campbell 1987, pp. 399, 400; some examples are given by Kretschmer 1909, pp. 640-41. On the name Istanbul, see H. İnalçık: "Istanbul," *EF* 4 (1978), p. 224.

presumably kept at the family workshop, or relied directly on his grandfather's work. As the extant sea charts of the world by al-Sharafī and his son are dependent on the grandfather's prototype, a comparative study of their toponymy with that of al-Sharafī's atlases would help to estimate the impact of the Majorcan chart on them. The combination of Arabic and European sources is already attested in the Maghreb Chart, al-Ṭanjī and al-Mursī.⁶⁸ As such, it is likely that al-Andalusī's atlas had also played an intermediary role in the transmission of European toponymy to al-Sharafī.

It is worth to note that al-Sharafī records several times Sant Yūrdī, which is a transliteration of the Catalan Sant Jordi, rather than the Italian San Giorgio which could have produced San Jurjīs or San Jurj. Among other examples, it stands for Sveti Juraj (Jurjevo) in the Adriatic, Cape Agios Georgios in the Aegean (this only in the first atlas), and Sfantu Gheorgue next to the Danube Delta. The first atlas adds *Sant* alone for Sant Jordi d'Alfama in Catalonia, which is already given in the Maghreb Chart (Sānṭ Jūrj). Both atlases include Artadur* (Cape Artatur) which is a typically Majorcan place name in the Adriatic.⁶⁹ Two hispanicisms are noticeable: Insulā d-Ālbī (Rab Island, again in the Adriatic), in the first atlas, and Insulārūsā (Dzharylgach Island, in Crimea), in both atlases. The latter is written in red ink only in the first one, in which it appears next to the Arabic term *al-qanṭara** (spit of land), for the Perekop Isthmus. Both hispanicisms are recorded in the *Catalan Atlas* (Albi, insula Rossa) and the *Estense World Map* (insula de alb, insularosa).⁷⁰ In addition, al-Sharafī renders the Italian Venice into Arabic as *Finīziya wa-hiya l-Bunduqīya** (Venice, that is, al-Bunduqīya).

As for the geographical terminology, al-Sharafī uses the form *qāb* more often than *qābū*, denoting a cape (Ar. *ra's*, *ṭarf*). These are transliterations of *cap* and *cauo* (*cavo*) respectively, which are familiar variants to both Majorcan and Venetian chartmakers. However, the form *qāb* (*cap*) is strongly associated to the Catalan language.⁷¹

⁶⁸ See Herrera 2008, pp. 296-98 (al-Ṭanjī); and footnote 64 (Maghreb Chart).

⁶⁹ Cf. Campbell 1987, p. 425; and Pujades' contribution to *L'Atles Català*, vol. 1, p. 42. In addition, Pujades 2007, p. 349ff. (appendix) lists the toponymy of the Adriatic and Catalanian seashores in 14th-15th-century Majorcan and Venetian charts.

⁷⁰ See *L'Atles Català* (fol. IV), vol. 1, pp. 133, 139; and *MCE*, pp. 137, 160.

⁷¹ For further discussion, see Rosselló 2000, pp. 83-84; and Rosselló 2004, pp. 321-24.

12. The wind network

The charts in al-Sharāfī's 1551 atlas lack a wind network proper, as the thirty-two wind directions radiate from the centre of the pages directly towards the margins. The winds are drawn in the same way in the 1563 atlas by Jaume Olives.⁷² In al-Sharāfī, North is indicated with a black arrow, usually placed at the bottom of the page. This North arrow already appears in the *Isolario* of Bartolommeo dalli Sonetti's (nickname of Bartolommeo Zamberti), printed in Venice in 1485,⁷³ and is also a distinctive feature of the charts in Pīrī Re'īs' *Baḥrīye*.

Al-Sharāfī's 1571 atlas shows a regular network of sixteen winds, with decorative medallions in the secondary centres. The perimeter defined by these centres, each marked with a pinhole, encloses the mapped surface in circumference of about 19 cm diameter. It is unclear whether the wind network was laid down earlier than the shape of the coastline.⁷⁴ In any event, my close examination of the atlas under the microscope convinced me that place names were inserted after both the network and the coastline had been drawn.

In each atlas, the centre of the wind system is marked with a pinhole deep enough to perforate the paper paste folios, so that one pinhole is shared by the two charts on both sides of the folio. This pinhole was probably made with a compass tip. The central point falls on identical cartographic locations in both atlases, for instance: next to Almuñécar, in the chart of the Iberian Peninsula; on the northern coast of Minorca, in the chart of the west central Mediterranean; to the south of Ancona, in the chart of the Adriatic; and in the Gulf of Argolis, in the chart showing the Peloponnese (east central Mediterranean). This indicates that the centre of the wind system was used as a reference point for drawing the coastline around it. Such a technique would have also helped to imitate the master

⁷² This is kept at Olomouc (Czech Republic), Research Library: M II 33. The electronic version is available at the Library website: < <http://dig.vkol.cz/> >.

⁷³ See G. Toliás: "Isolarii, Fifteenth to Seventeenth Century," in *The History of Cartography*, vol. 3:1 (2007), (pp. 263-84) 268-69 (Sonetti's *Isolario*), 269-70 (*Baḥrīye*). The *isolarii* (*books on islands*) had a strong influence on the making of *Baḥrīye*: see Soucek 1992, pp. 277-78; Soucek 1996, p. 20ff.

⁷⁴ It was actually settled before the coastline in four 14th-15th-century charts from the British Library: cf. Campbell 1987, p. 390. This topic is discussed by Pujades 2007, p. 188ff. See footnote 59.

copy proportionally, and this supports the idea that the charts of both atlases are derived from a common model.

13. The pomegranate

A rare feature of al-Sharafī's cartography is the miniature of a pomegranate placed on the Iberian Peninsula, to be interpreted as an icon for the Nasrid kingdom of Granada.⁷⁵ The pomegranate appears on both atlases as well as the sea charts of the world by al-Sharafī and his son. This icon fuels an evocative nostalgic image of al-Andalus, and implies moral support to emigrant *moriscos* from the Iberian Peninsula in the context of the Ottoman defence of Mediterranean Islam. It is uncertain whether the insertion of the pomegranate was an original idea of al-Sharafī, or it was copied from the earlier cartography of his family, the atlas of Aḥmad al-Andalusī, who maybe was a *morisco* himself, or other sources. He could have also learned about its symbolism from the many *moriscos* that had settled in Tunisia and kept alive their Andalusian traditions.⁷⁶ In any event, the fruit appears already in Jaume Bertrán's 1489 chart where a figure, perhaps King Ferdinand the Catholic, holds a pomegranate in his hand anticipating the fall of Islamic Granada (1492).⁷⁷

Al-Sharafī draws the rivers Guadalquivir and Segura flowing from a common source at the top of the pomegranate. This source is distinctively placed at the top of Mount Segura by Majorcan chartmakers, whose depiction of the river courses towards their mouths in the Atlantic and the Mediterranean can be traced back to al-Idrīsī's Geography.⁷⁸

⁷⁵ This is studied by Herrera 2009.

⁷⁶ See Epalza 1992, pp. 261-76; and L. Bernabé: "Notas sobre la cohesión de la comunidad morisca más allá de su expulsión de España," *Al-Qanṭara* 29:2 (2008), pp. 307-32.

⁷⁷ This chart is mentioned by Sáenz 2008, pp. 631-32; *idem*: "La Reconquista cartográfica. El Islam peninsular en la cartografía medieval hispana," *Treballs de la Societat Catalana de Geografia* 61-62 (2006), (pp. 279-301) fig. 8.

⁷⁸ See Herrera 2009. The image of Mount Segura in Majorcan chartmaking is described by Rey & García 1960, p. 29; and Sáenz 2008, p. 369.

⁷⁹ This table only enters toponyms recorded in al-Sharafī's atlases, though *L'Atlas Català* (fol. IV, in vol. 1, pp. 139, 141) and the *Estense World Map* (*MCE*, pp. 165, 167, 168-69) offer more details for the same section of coastline. See also Kretschmer 1909, pp. 639, 652-53 for other European charts.

Comparative table of place names in north-western Anatolia and the Dardanelles ⁷⁹					
<i>Catalan Atlas</i> (ca. 1375)	MCE (ca. 1450)	al-Sharāfi Atlas 1551	al-Sharāfi Atlas 1571	Place-name identification	
Sesmir	laxmiro*	Izmīra*	Izmīr(a)*	Izmīr	
Foya	foya*	Fūja*	Fūja*	Yenifoça	
Cristo (golf de Laler) ⁸⁰	criso	Krīstū	Krīstū	at Çandarlı Körfezi	
Stingary	stringani	Stinkām	Stinkām	(cape)	
San Zorzo	santiordi	Sant Yürdi	Sant Yürdi	next to Ayvalık	
Landermiti*	ladermeti*	Ladrimīti*	Ladrimīti*	Edremit	
cauo Sancta-Maria	cauo sta maria	Qāb Sant Māriyā	Qāb	Baba Burnu	
Dardanelo	Dardanello	al-Būghāz*	al-Būghāz*	Çanakkale Boğazı (Eng. Dardanelles)	
Gallipolli*	Gallipoli*	Kālibūli*	Kālibūli*	Gelibolu (Eng. Gallipoli)	
	G. de cardia	Kardiya		Saros Körfezi	

⁸⁰ This already appears as *Golfo di Cristo* in Vesconte's works: cf. Kretschmer 1909, p. 653.

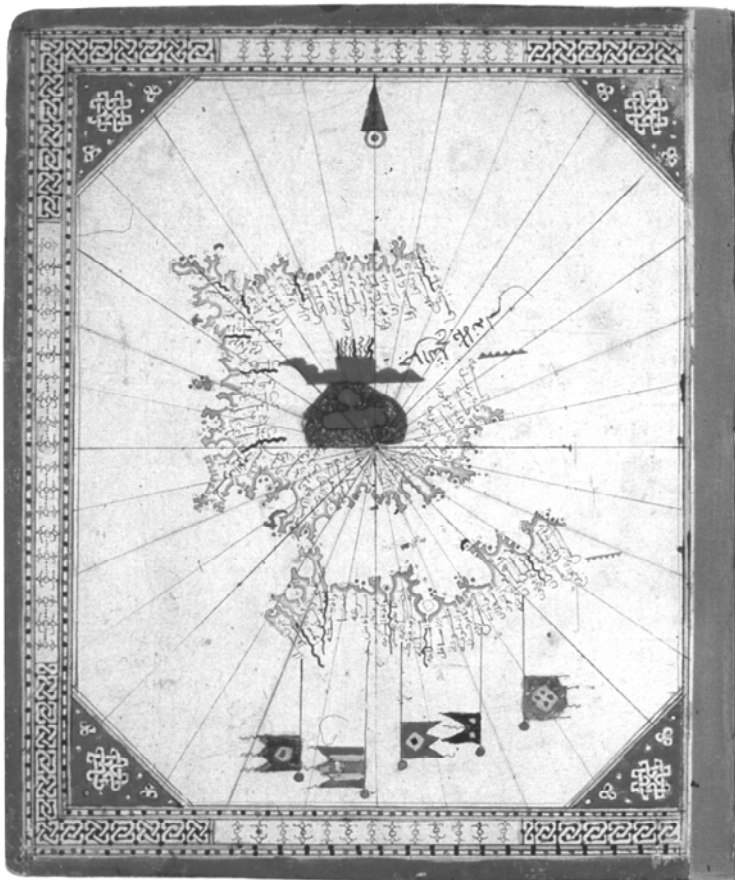


Fig. 3: AL-SHARAFĪ'S 1511 ATLAS

Sectional sea chart of the Iberian Peninsula and the western Maghreb (fol. 3v), oriented southwards in the original (northwards in the picture).
Courtesy of the Bibliothèque nationale de France, Paris (MS arabe 2278).

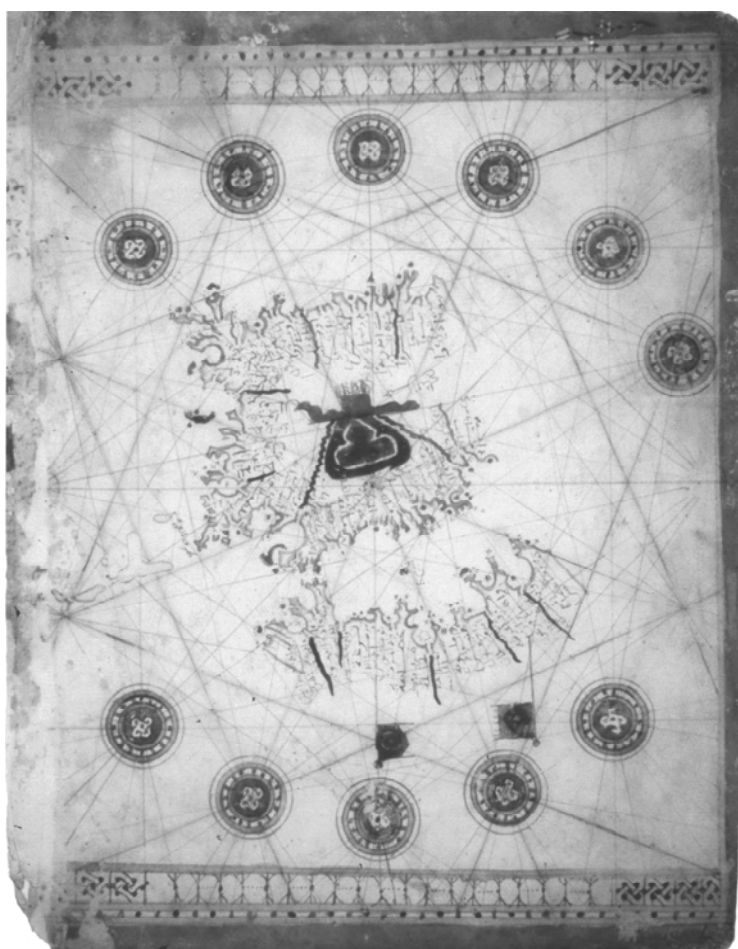


Fig. 4: AL-SHARAFĪ'S 1571 ATLAS
Sectional sea chart of the Iberian Peninsula and the western Maghreb (fol. 7r),
oriented southwards in the original (northwards in the picture).
Courtesy of the Bodleian Library, Oxford (MS Marsh 294).

14. Conclusion

The two extant atlases of the 16th-century Tunisian chartmaker and scholar ʿAlī al-Sharafī are indispensable documents for understanding the history and development of Maghrebi nautical cartography in the Mediterranean context. They provide precious information on al-Sharafī's chartmaking techniques, production and sources, which include the output of his own family. Moreover, their study raises interesting questions on the working conditions in which Maghrebi and Andalusian chartmakers flourished and the impact of their legacy. The emergence in Istanbul of a certain Aḥmad al-Andalusī, which is quoted as one of al-Sharafī's sources, also brings forward the issue of the Andalusian involvement in Mediterranean nautical cartography.

The similar contents and structure of al-Sharafī's atlases imply a systematic method of composition which would have favoured a regular production of such works at market demand. This might have allowed al-Sharafī to earn a living as a professional chartmaker for about three decades. Furthermore, the second atlas informs us of three otherwise unknown sea charts of the world which he had probably made before 1571. A total of six charts of this kind, four of them by al-Sharafī himself, can now be safely attributed to the Sharafī family. Only two of these, one by al-Sharafī (1579) and another by his son, have survived.

The 1551 atlas is a visually striking work of art, whereas the one from 1571 is an extended functional version with a larger set of calendrical and folk astronomical material. The latter atlas has been heavily used and is worn out, in contrast to the first one which is preserved in excellent condition. Both offer almost identical sea charts of the Mediterranean and the Black Sea, which seem to have been derived from a common model or master copy. They show the same geographical distribution, coastline layout and drawing technique, though they are more carefully copied and have a higher density of place names in the first atlas. Only the second one supplies the charts with a network of wind directions and adds a nautical wind rose.

The diverse origins of al-Sharafī's sources provide good testimony to the transfer of knowledge within the Maghrebi and Andalusian chartmaking tradition, and to the positive influence of the Majorcan one into the latter. Most of his Arabic coastal place names for the Islamic Mediterranean are already attested in the 15th-century works of al-Ṭanjī and al-Mursī, though no direct connection can be established between

them. They all offer exhaustive compilations of Arabic toponymy which are an outstanding contribution of Maghrebi chartmakers to Mediterranean cartography. On the contrary, al-Sharafī's place names for Mediterranean Europe and the Black Sea are mostly transliterated from a 15th or 16th-century Majorcan chart. The latter might have influenced al-Sharafī through his grandfather's sea chart of the world for which a Majorcan model was consulted. Other sources, such as al-Andalusī's atlas, might have played an intermediary role in the transmission of European, and possibly Ottoman Turkish, toponymy to al-Sharafī. Political changes in the Mediterranean also explain the inclusion of distinctive Majorcan place names next to the traditional Arabic ones in the Iberian Peninsula, as well as updated Ottoman Turkish designations in the Aegean and the Balkans.

The combination of Islamic, mainly Arabic, and European sources, manifest in all the extant Maghrebi nautical cartography, was encouraged by the circulation of sea charts across the Mediterranean, within the frame of migrations, trading interaction and cultural exchange. Indeed, the Majorcan elements observed in the works of al-Ṭanjī and the Sharafīs suggests the availability of Majorcan charts in Tunisia (at least in Tunis and Sfax) between the 15th and 16th centuries. Further research should try to evaluate the impact and spreading of Maghrebi chartmaking in Majorcan and Venetian workshops of the same period.

15. Acknowledgements

This paper is based on my forthcoming doctoral dissertation *Cartografía náutica árabe en el siglo XVI: Los atlas de ʿAlī al-Šarafī de Sfax*. I have been able to consult the manuscripts of al-Sharafī's atlases thanks to two visits to the Bibliothèque nationale de France and the Bodleian Library. These trips were generously supported by the research projects *La actividad científica de herencia árabe en la España del siglo XV: El caso del Sexagenarium* (Gobierno de Canarias PI2000/133) at the University of La Laguna, and *Cartografía náutica árabe en el contexto mediterráneo, ca. 1300–1600: Influencias entre oriente y occidente* (Ministerio de Educación HUM2005–03375/FILO) at the University of Barcelona. I am grateful to Mercè Comes (Barcelona) and Mohsen Zakeri (Frankfurt) for their critical readings and useful suggestions, and to Colin Wakefield for his kind help during my stay at the Bodleian (Oriental Collections).

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⁸¹ Full references given in the footnotes are not repeated in the bibliography.

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