Indian Ocean Arab Navigation Studies
Towards a Global Perspective: Annotated Bibliography and Research Roadmap

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RUTTER Technical Notes are research materials and studies resulting from the activities and investigation of members of the Project RUTTER Making the Earth Global. Although their primary intention is to assist in the various tasks of the RUTTER Team, they are made public in the spirit of academic collaboration and sharing. RUTTER Technical Notes are non-periodic and will cover topics as diverse as the ones that interest the international and multidisciplinary Project’s team. The main objective of the RUTTER Project is to write a narrative of the scaling up of a scientific description of the earth in the sixteenth and seventeenth centuries, and how it grew out of the lived experience of travelling and observing the earth in long-distance sea voyages. It aims at radically improving our present knowledge of the historical processes that led to the formation of global concepts about the earth. The RUTTER Project is the ERC-funded Project “RUTTER Making the Earth Global: Early Modern Rutters and the Construction of a Global Concept of the Earth” (ERC Advanced Grant 833438; IR: Henrique Leitão, Faculdade de Ciências, University of Lisbon).

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Introduction

The present work is both a historical overview and a report on the current state of affairs in the field of Arab navigation studies, with particular attention to Indian Ocean navigation. Having in view the earliest historical testimonies, and comprising both nautical technical and more general maritime literature, we focus on the late medieval and early modern periods. Although we are aware of the inextricable relation between the studies of different aspects of Indian Ocean Arab navigation, and though we are surveying and profiting from a wide range of sources, our particular research within the ERC RUTTER Project gives a certain angle to our perspective: we are primarily concerned with the seamanship treatises (in Portuguese, livros de marinharia) by Arab authors, and how they were shared with or made their way into other nautical traditions. In this regard, we are fortunate to benefit from the extraordinary pool of knowledge of our colleagues at the Centro Interuniversitário de História das Ciências e da Tecnologia, Lisbon, and we offer a contribution which while not leaving historical stones unturned, is fully apprised with the living reality and practice of nautical sciences.

In a collegial spirit, this technical note is also meant to be a contribution for other scholars in the field, a gathering of sources conducive to further research. In this aspect, it is by definition and even hopefully incomplete, offered like a stepping stone along the road, somewhat in response to Allen’s clarion call for a “deeper, wider, better co-ordinated academic effort” on Indian Ocean studies (1980, 148). Closer to our own work, it is also meant to be an executive summary, acting as a preamble and a roadmap for impending in-depth research, all within the frame of the RUTTER Project.

Furthermore, in the wake of the ongoing shift of historical disciplines towards a concretely global perspective, we mean hereby to prepare the ground for and to engage in a decentralised and transnational approach to Arab Navigation studies. With very few exceptions which we shall mention below, the major earlier iterations within the field (most notably the pioneering works by Ferrand and Tibbetts) were still imbued with Western centre-periphery views, and therefore not exempt of a degree of Eurocentric bias. But the time is now ripe for a full integration of secondary sources in the light of new manuscript finds, including a wealth of new sources coming from the Middle East (particularly the works of Khoury and Shihab) and from India and Pakistan. As in many other historical fields, an amalgamation of scholarly traditions is long overdue, to bring non-Western publications into the picture and on an equal footing.
We use English quite deliberately as an instrument, as the *de facto* scholarly language of the day, but without any claim to particular suitability. The limitations on this attempt will naturally be those of the language skills shared by the work team: while we will be working with sources in most European languages and in Arabic, we are aware that there are still significant contributions in Persian, Swahili, Tamil, Turkish, Urdu, and other languages which remain out of our immediate scope (see Nadvi 1966, 149ff.).

**Chronology**

We are convinced that the timeliness, or even urgency, of such a comprehensive survey as this one comes out from the broad strokes of a chronology of the discipline.

Leaving aside early medieval travel literature, some of which we will mention below, we focus on nautical literature from the appearance of the two most influential corpora in the fifteenth and sixteenth centuries, namely the works of Aḥmad ibn Mājid and Sulaymān al-Mahri. The first question is: how were their writings transmitted and studied in these past five centuries? and how did we arrive at the current situation?

On one hand there seems to have been an uninterrupted, mostly oral, professional transmission of the writings just mentioned in the Arabian Sea, where ship captains were using some or other version of them until the advent and general adoption of modern nautical charts and navigation methods (Agius 2005, 175). Scholarly speaking, the first notable recognition and appropriation of the two authors took place in Turkey, when a famous seventeenth century Ottoman admiral, Sidi ʿAlī Çelebī, praised them in his major work and made use of their information.

After this, contemporary studies of Arab navigation begin in two phases, and the first one, in the mid-nineteenth century, consists of works by Joseph von Hammer and by James Prinsep largely dedicated to Çelebī; a second phase begins with the works of Gabriel Ferrand in the early twentieth century and continues uninterrupted to our days.\(^1\)

Almost simultaneously with von Hammer’s main work, the Omani general who conquered Mombasa in 1839, Shaykh Āl ibn ʿAli, was giving orders for the “very useful” texts of Ibn Mājid to be copied in the wake of his victory (al-Ghunaym 2006, 281). The destiny of those copies is yet to be discovered, but the contemporary publications by von Hammer did come to fruition and eventually inspired the second phase, kickstarted by the French scholar Gabriel Ferrand in the 1920s. Ferrand published facsimilar editions of two comprehensive manuscripts (details below), preceded and followed by several nautical essays by him and other related authors. In 1966, Allamah Sulayman Nadvi published in Lahore his *The Arab Navigation*, while in Britain Gerald Tibbetts was publishing a series of articles, culminating in his 1971 English translation of Ibn Mājid’s *Fawāʾid*. This translation was published in the same year that the first critical edition of the *Fawāʾid* text was published by Ibrahim Khoury in Damascus, along with three other volumes of key works and lengthy articles comprising the verse works of Ibn Mājid.

As of today, Khoury’s Arabic volumes and articles constitute the reference editions for the

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\(^1\) Agius (2005, 4–9) and Staples (2017, 224–228) have excellent overviews upon which we are gratefully expanding here. All authors and works mentioned will be treated in more detail below.
main works of Ibn Mājid and al-Mahrī, but their impact seems to have been very limited, and they have yet to elicit the amount of scholarship generated by Ferrand’s earlier work in the 1920s. Similarly, in 1989 Khoury chaired a “Conference for the Revivification of Ibn Majid’s Heritage” (Al-Nadwah al-ʿilmiyah li-iḥyāʾ turāth Ibn Mājid), with proceedings published in two volumes in 1992, but its impact seems to have been very limited, probably because of its limited diffusion outside the Arabic-speaking world.

In line with such efforts, a significant amount of quality publications have been added to the literature, focusing not exclusively on the early modern texts but approaching the subject from a technical nautical aspect, as in the works of Grosset-Grange and Malhão Pereira, or historically focused on particular topics, like the works of Agius, or bringing valuable archaeological data to bear on navigation matters. More recently, the works of Ducène, though mainly with a cartographical interest, give testimony to an ongoing shift towards more inclusive Indian Ocean Studies, bringing nautical matters into an interdisciplinary approach to the field; this has been as it were ratified by the consolidation, from 2011, of the Indian Ocean World Centre (IOWC, McGill University), which started in the 1990s in South African academia, and now runs the biannual Journal of Indian Ocean World Studies. A fruitful and remarkable practical initiative was the 2008–2010 experimental voyage in a replica of a medieval vessel, the Jewel of Muscat, from Oman to Singapore, undertaken by a multidisciplinary crew, documented by Eric Staples (2013) and followed by very interesting and concrete observations on traditional navigation techniques. A number of other similar projects are under way, like the Centre de Recherches sur les Sociétés de l’Océan Indien, based at the University of La Réunion, which bring to the field of studies all the benefits of local knowledge and connections, while working from a global historical perspective. In general, both Indian Ocean Studies and Maritime Studies have been emerging and consolidating as independent disciplines over the past two decades, with new journals, research centres and museum initiatives appearing; they provide a rich and thriving context for the more specific Arabic dimensions on which we focus here.

In the following pages, we start by listing and discussing the known manuscripts of the main Arab nautical authors, giving, as far as possible, references and direct links to their locations in libraries worldwide. Section 2 singles out the most important authors, noting in some detail the contents of their works, thereby effectively providing an overview of the primary themes treated in the literature. A final and third section takes the form of an annotated bibliography, providing shorter or longer running commentaries, as needed, to weave a coherent narrative regarding the history, the current status, and the prospects of our field of studies.

As is customary in Arabic and Islamic studies, we give the dates in Hijri/Gregorian format for Islamic sources, and names are alphabetized ignoring the article al-. For the transliteration, we follow as closely as possible the ALA-LC Romanization tables.

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2See Section 4 below for a commented list of dedicated websites.
3See for instance the Journal of the Indian Ocean Region.
1 Primary Sources

As mentioned above, the two canonical authors of Arab nautical literature are Aḥmad ibn Mājīd and Sulaymān al-Mahrī. They come respectively from the Persian Gulf region and from Yemen, and their lives spanned the late fifteenth and early sixteenth centuries. Their works follow each other chronologically, and they are the avowed and self-conscious result of centuries of Indian Ocean and Red Sea sailing routes, and of an international precious cumulative body of experience and know-how. Part of what they convey comes from genres closely related to nautical literature, like itineraries and geography books (e.g. Sīrāfī and Masʿūdī). Their influence is clear in some later authors like ʿAlī Çelebī, who translated into Turkish passages from al-Mahrī, and less direct and still to be ascertained in a great number of other works, including Mediterranean sources and Western languages.

One of the important features of this early nauticalliterature is that it is written by experts and for experts, and it was regarded and valued as such by subsequent transmitters. This explains, for instance, that Ibn Mājīd not only became a textual authority and a technical reference, as mentioned above, but even a sort of patron saint of Islamic sailors through the centuries, even down to the early twentieth century.

Before Ibn Mājīd, that is, before the fifteenth century, and strictly within nautical literature, he himself gives a lineage of writers and pilots, whose names may be used to guide future archival searches:4

“In the time of the Abbasids, there were three famous men: Muḥammad ibn Shādhān, Sahl ibn Abbān, and Layth ibn Kahlān.”

Ibn Mājīd is said to have seen the handwriting of the latter’s son in a rutter (rahmānaj), with the incipit

“Lo, we have made you victorious... (innā fataḥnā laka).” “There were famous pilots around the same time: ‘Abd al-ʿAzīz ibn Aḥmad al-Maghribī (or al-Maʿrūf; perhaps Moroccan?), Mūsā al-Qandarānī (or Qīdarānī), and Maymūn ibn Khalīl [Jewish perhaps?]”

Before them there were two other writers from which they had borrowed: “Aḥmad ibn Tabruwayh (or Tabrūyah or Bayruwayh) and Khawāshīr ibn Yūsuf ibn Ṣalāḥ al-Lāzki (or al-Arikī or al-Azkī), who was travelling on AH 400” (ca. AD 1022, so now we have a span of approximately five hundred years under the gaze of Ibn Mājīd’s narrative) “in the vessel of a certain Indian Dayūkāra” (or Diukār or Dabūkarak; a name which may help establish chronology). “The latter two were contemporaries of the famous captain Aḥmad ibn Muḥammad ibn ʿAbd al-Raḥmān ibn Abī al-Faḍl al-Maghribī” (another Moroccan perhaps, and quite remarkable as a connection with north-west African sailing tradition).

The term mentioned above for a rutter or simply a volume of nautical instructions, rahmānaj, is of obvious Persian origin. Apart from it, the Arabic daftar (notebook) is also used.

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4Names are collated from Khoury’s Fawāʿid edition and the earliest known Bodleian manuscript, see below.
At the moment, none of these notebooks nor any work from the above mentioned mariners has come to public attention. The connection with India goes back to the earliest times, and has been a constant element even to our days (Staples 2013, 237).

Before examining in some detail the main works and themes of this nautical literature, let us have a look at the main manuscript sources and the existing editions on which the literature has so far been based.

### 1.1 Manuscripts

In this section we make available the information on the main manuscript sources, providing specific archival hyperlinks when possible. In addition to those listed below, we are aware of the existence of certain relevant manuscripts, notably in Peshawar (Nadvi 1966, 148) and in Cairo (Mss. 308 and 309 contain works of al-Mahrī), which we have not been able to obtain. As Grosset-Grange (1996, 242) has pointed out, numerous sources are still “disperse in the archives of the nations which were part of the complex history of navigation in the Indian Ocean.” And on a wider scale, it is well known in Arabic-Islamic Studies that there is around the world an enormous wealth of manuscript material which eludes digital searches and requires direct access.\(^5\) While we may yet engage in research trips to partially fill the gaps, it is our present desideratum —and an invitation is hereby extended— to interact and collaborate from the distance with local scholars from the countries around the Indian Ocean basin. For historical reasons, it would be hardly surprising to find new manuscripts relevant to our work in the public libraries along the east coast of Africa and the west coast of India. Similarly, it has been pointed out (Allen 1980, 142–3; Agius 2005, 207) that private collections in the Gulf and elsewhere may still hold important and as yet unstudied works.

#### 1.1.1 Bahrain

**Ms. in private collection of ʿAlī Muḥammad al-Tājir**

Dated 1091/1679, 238 folios (hereafter B1). Abbreviated by Khoury as ʿ, for *Tājirīyah*.

This Ms. includes several works by Ibn Mājid, including the *Kitāb al-fawāʾid* and the *Ḥāwīyah al-ikhtiṣār*. Khoury considered it the best and most reliable of the three Mss. used for his 1971 critical edition,\(^6\) though Shihāb disagreed with this and considered the other two better. It seems to be the same Ms. that contains several works by al-Mahrī.

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\(^5\)See the Introduction to Al-Furqan Foundation *World Survey of Islamic Manuscripts*.

1.1.2 Damascus

Al-Assad National Library, Ms. 3114

Dated 1001/1592, and produced in Mecca, 173/174 folios (hereafter D1). Abbreviated by Khoury as ظ, for Zahiriyah.

The Ms. includes at least sixteen works by Ibn Mājid. Among these are the Kitāb al-fawāʾid and the Ḥāwīyah. It was first found in the Zahiriyah Library in Damascus, with the codex number 3114, and later moved to al-Assad National Library. In 1925, Najm al-Dīn al-Bey wrote a copy of it which is now in the Library of Congress. There seem to exist only three descriptions of this Ms. and they do not completely match. The first was written by Najm al-Dīn al-Bey in 1925, the second was written by Ibrahim Khoury in 1971, and the third by al-Ghunaim in 2006. Al-Bey’s description was translated into English by Tolmacheva in 1994 and claims that the Ms. contains 173 folios with twenty three lines per page. Khoury describes the manuscript as containing 174 folios with twenty three lines per page. Furthermore, although Khoury and al-Ghunaim claim the Ms. includes the same nineteen works that are found in P1, the copy in the library of Congress includes only sixteen of those works.

1.1.3 Kuwait

Ministry of Awqaf and Islamic Affairs, 195(3)

No date, 71 folios (hereafter K1).

This Ms. was unknown to Khoury. It contains only the Fawāʾid. A facsimilar edition was published by al-Ghunaim in 2004, who calls it the Abdullah Khalaf Ms., after the Kuwaiti scholar who used to own it.

1.1.4 Leiden

Leiden University Library, Or. 8660

Dated 1059/1649 (hereafter Le1). Abbreviated by Khoury as ل.

The Ms. includes two works by Sulaimān al-Mahrī: Al-ʿUmdat al-mahrīyah and Minhāj al-fākhīr. External Link.

1.1.5 Lisbon

Biblioteca Nacional de Portugal, Ms. Or.2

This previously unstudied manuscript has been under study by the RUTTER team. It is 94 folios long and includes several rutters with different dates, from 1243/1827
to 1265/1849). It has several illustrations and several sets of tables (astronomical and nautical), dealing with routes to Aden and the East coast of Africa. Its contents make it a middle link in the transmission between late medieval and nineteenth-century Indian Ocean nautical literature, in fact quite close in some respects to Gujarati sailing manuals.

Two titles are given within the manuscript, both associated in some undetermined way to ʿAbd Allāh ibn Ahmad ibn ʿAbd al-Razzâq, an otherwise unknown figure mentioned by Agha Bozorg Tehrani in his Dhayl kashf al-zunūn (1967) as author of Islamic works living around 1838. The first title (fol. 1r) is Salwat al-mahmūm wa-al-ʿiṭr al-mashmūm fī ʿilm al-mubārak ʿalā al-ʿalāmāt wa-al-majārī wa-al-nujūm (The Solace of the Distressed, and the Fragrant Perfume on the Blessed Science of Landmarks, Routes and Stars), and the second title (fol. 31r) is Al-faraḥ al-nālīn wa-qiblat al-muṣallīn (The Joy of the Successful and the Qiblah of Those Who Pray). Some mispagination and interpolation are evident. A detailed study by J. Acevedo is forthcoming in 2021. Hereafter abbreviated Li 1.

1.1.6 Oman

Ministry of Cultural Heritage of Oman, 3561–1

Dated 1157/1744 (hereafter O1). It contains several nautical poems by Ibn Mājid, including the Nūniyāh al-kubrā as described in Shihāb (1993). Link to Library.

Ministry of Cultural Heritage of Oman, 3910

Date uncertain. 18 folios (hereafter O2). Contains Al-Mahrī’s Minhāj. Link to Library.

1.1.7 Oxford

Bodleian Library, MS. Selden superius 24

Oxford University. Dated 15th century, 31 folios (hereafter Oxon. 1).

This Ms. includes nine minor treatises by Ibn Mājid, including four unpublished: the Qaṣīdah qad ṣadāḥa al-dīk (“The Cock Has Crowed”); the Urjūzah fī musāyarat al-arḍ min ʿadan īlā jiddah (“Going by the Land from Aden to Jeddah”); the Qaṣīdah al-shahīrah bi-misallat al-fūlādhī (“Famous Poem on the Steel Needle”); and the Qaṣīdah fī waṣf al-ṭarīq min al-bāb ilā jiddah fī musāyarat al-sāḥil (“On the Description of the Way from Bab-el-Mandeb to Jeddah Going by the Coast”). External link.

This and the following two Oxford Mss. seem to come from the same hand, though only Oxon. 2 is dated, see below. It is remarkable that, being very early Mss., they have remained practically unstudied to date and have not formed part of any critical edition, as observed by al-Ghunaim (2004, 19).
Bodleian Library, MS. Selden superius 46
Dated 894/1489, 129 folios (hereafter Oxon. 2).

The Ms. contains the full text of Kitāb al-fawā'id. External link.

Bodleian Library, MS. Selden superius 57
Dated 15th century, 35 folios (hereafter Oxon. 3)

The Ms. contains the Ḥāwīyah al-ikhtiṣār. External link.

1.1.8 Paris
BnF, Arabe 2559
Dated sixteenth century, 187 folios (hereafter P2). Abbreviated by Khoury as ب

The Ms. includes nine works: four by Ibn Mājid and five by Sulaymān al-Mahrī. Among Ibn Mājid’s works there is a copy of the Ḥāwiyah. Among al-Mahrī’s, there are the al-ʿUmdah and al-Minhāj. External link.

BnF, Arabe 2292
Dated 983/1576, 183 folios (hereafter P1).

The Ms. includes nineteen works by Ibn Mājid. The first two are the Kitāb al-fawāʿid and the Ḥāwiyat al-ikhtiṣār. The remaining seventeen are minor metrical treatises mostly on nautical matters. External link.

1.1.9 Qatar
National Library, Or 15643
Dated 1153/1740, 5 folios (hereafter Q1).

Small Ms. including Sulaymān al-Mahrī’s Tuḥfat al-fuḥūl. External link.

1.1.10 Russian Academy of Sciences
Russian Academy of Sciences, B.992
Dated sixteenth century (hereafter PP992)

The Ms. includes several Arabic and Turkish texts, among which are Ibn Mājid’s Sufāliyah, Al-Maʿlaqīyah, Al-Tāʿiyah. PDF files of the Catalogues available here.
1.1.11 Washington D.C.

Library of Congress, VK551 .A46

Dated 1344/1926, 174 folios (hereafter W1)

The Ms. includes sixteen works by Ibn Mājid, the first two being the Kitāb al-fawāʾid and the Ḥāwīyah. In terms of contents, this Ms. is similar to P1, except for three poems absent in P1: the ʿIddat al-shuhūr, the Fī maʿrifat al-manāzil and the Kitāb al-fuṣūl. External link.

1.1.12 Yale

Yale University Library, Landberg MSS 401. Dated ca. 976/1568, 156 folios (hereafter Y1). Abbreviated by Khoury as ي.

The Ms. includes 4 works by Sulaymān al-Mahrī: Al-Minhāj al-fākhir; ʿUmdat al-mahrīyah; Tuḥfat al-fuḥūl; and Mirʾāt al-salāk li-kurāt al-aflāk. With the exception of the latter, all these are also found in P2. External link.

2 Main Works and Authors

In this section we list chronologically from the earliest testimonies the works pertaining to Arabic navigation, with a more or less detailed overview of their themes and historical relevance. As can be seen below, the earliest works are not nautical treatises, but only give maritime information in passing; they are helpful nonetheless, for various reasons, not least because they help establish a chronology towards the extant nautical treatises of the fifteenth century and afterwards. Trying to retain our focus on properly nautical texts, we have had to draw a line and decided to leave out of this list some of those earliest works, like the travel narratives of Ibn Battuta or Ibn Mujāwir, and the geographic work of al-Masʿūdī.

2.1 Kitāb al-masālik wa al-mamālik (9th/10th century)

Book of Routes and Kingdoms, by Ibn Khurdādhbih (also transliterated Ibn Khurradadhbih and variously otherwise, d. between 272/885 and 300/912). One Ms. of this work is found at the Bodleian Library (MS. Huntington 433). External Link.

Describing different routes from one specific location to another, Ibn Khurdādhbih’s book has been seen as a “manual for the use of secretaries of the administration” (Pellat, 2020). Even though most routes are land routes, there is one

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7The description from Yale University catalog conflicts with Khoury’s and Tibbetts’. In his 1971 edition, Khoury dates the manuscript in 1097/1686. Tibbetts, in his article for the Enciclopedia of Islam, refers to the manuscript as “Yale Arab ms. 1480, 1535, 1536–7” and dates it 1091/1680. Neither of the authors mentions the Mirʾāt al-salāk li-kurāt al-aflāk.
–from Basra to “the Orient”– by sea which describes specific distances, locations and landmarks.

**Editions and Studies:**

### 2.2 Akhbār al-ṣīn wa-al-hind (9th-10th century)

*Narratives of China and India*, by Abū Zayd al-Sīrāfī. It is found in a single Ms. at the BnF, Ms. Arabe 2281 (2a–23b). [External link](#).

*Akhbār al-ṣīn wa-al-hind* is actually the fusion of two different works: the first was written in 237/851–52 by an unknown author and the second—which aimed at developing and correcting the former’s contents—was composed somewhere between 271/884 and 332/943–44 by Abū Zayd al-Sīrāfī. Taken together, they form a work made by various journeys accounts which took place around the Indian Ocean. Such accounts were originally not from the authors themselves but gathered from informers who—for the most part—remain anonymous and often worked in commercial trade.

Even though it contains interesting passages regarding shipbuilding and the seas of the Indian Ocean, the second book has very little information regarding routes or navigation. In fact, sailors’ (*al-baḥriyūn*) accounts were even avoided by Abū Zayd, who deemed them unreliable (2014, 132–33). The same does not happen in the first book. Although it is also concerned with descriptions of far away peoples and their costumes, such descriptions are preceded, first, by chapter “On The Sea Route from Strāf to Khāmū” (in China) (2014, 31), and then by another “On Tides and Usual Phenomena of the Seas” (2014, 35). It is only after this voyage, that the reader arrives to an account on “The Chinese and Some of their Customs” (2014, 37).

**Edition and Studies:**
The book is a collection of 134 mariners’ tales gathered by a Buzurg ibn Shahriyār, a ship captain (nākhudā) of Persian origin. It describes the adventures of men who, sailing the Red Sea, the Persian Gulf and the Indian Ocean, came across different cultures, environments, wonders and perils. The book does not attempt to give precise descriptions of navigation routes or practices, but, rather, it is considered as part of a literary genre of marvels and wonders of nature, in which imagination and reality are often mixed. Nevertheless, the value of the Kitāb ʿAjāʾib as an early source on Arabic navigation should not be underestimated. These tenth century tales, originally told by captains, pilots and marines—while not describing them fully—do include specific sea routes, navigational terms and useful knowledge concerning stars, winds and landmarks that, centuries later, still feature in Ibn Mājid and al-Mahrī’s works. It is a popular book and we are aware of the existence of other Arabic editions we have not been able to track.

**Edition and Studies:**


2.4 *Aḥsan al-taqāsīm fī maʿrifat al-aqālīm (10th century)*


A geographical book which, while describing the rivers and seas, provides information regarding tenth century maritime culture. It is the last of five works produced by what has been called the Balkhī School of geographers. Before *Aḥsan al-taqāsīm* there were al-Balhkī’s *Ṣuwar al-aqālīm* (*Shapes of the Climes*), al-Iṣṭākhri’s *Kitāb al-masālik wa al-mamālik* and Ibn Ḥawqal’s *Ṣurat al-ạrḍ* (*Image of the Land*). All these aimed at representing the lands and seas of Islam both in texts and in maps.

*Aḥsan al-taqāsīm* is not particularly innovative in terms of contents. Like the geographers that preceded him, al-Maqdisī describes Islam as encompassing two seas: The Indian Ocean and the Mediterranean. In a continuity with the Greek and Roman tradition, the Red Sea and the Persian Gulf are perceived not as separated entities, but rather as two integrated parts of the Indian Ocean, differentiated by specific currents, winds, islands and coasts.

By contrast, the method applied for collecting and organizing information seems to be particular to this work. Unlike the precedent members of the Balkhī School, al-Maqdisī often mentions his sources in order to argue for the reliability of his descriptions. His chapter “On the Seas and Rivers,” begins by explaining that the information presented was collected by consulting the highest authorities in such matters: men who frequently sailed the seas.

“And I kept company with elders born and bred around this sea, from among the captains, officers, navigators, agents and tradesmen, and I found them to be the keenest of men about it, about its anchorages, winds and islands, and I asked them about its matters and limits, and I saw they have notebooks (dafātir) regarding all this from which they learn, and upon which they rely and act” (2003, 17).

By consulting seamen, al-Maqdisī extends the scope of his work. Apart from the geographical descriptions, it includes useful accounts that specify how certain conditions affect navigational practices. That way, along with details on what sailors carried, the chapter points to the perils sea travellers are exposed to and how they should proceed to avoid them. As André Miquel put it, al-Maqdisī intended “to create a useful science, notably to merchants and the cultivated man” (2012).

**Editions and Studies:**
2.5 Aḥmad ibn Mājid (mid 15th century)

Shihāb al-Dīn Aḥmad ibn Mājid (d. ca. 1500) has a proverbial and uncontested place as the Arab authority on navigation. Beyond the ken of Arab navigation strictly, he has added historical importance because, born ca. 1420, he was in his prime during the middle of the fifteenth century, and his works are known to have been already circulating by the time of the Portuguese arrival in the Indian Ocean. For almost a century it became commonplace in navigation literature that he had been the one who guided Vasco da Gama from Malindi to India. This claim has been proved repeatedly and in detail to be fanciful, especially by Ibrahim Khoury, who devoted decades to editing critically and publishing Ibn Mājid from all the manuscripts he could muster (see in particular Khoury 2001, 213 ff.). It can undoubtedly be affirmed, nevertheless, that Ibn Mājīd did help Da Gama, but only through the presence of his writings. In fact, Khoury himself speaks (2001, 104, 114)) of a nautical text by Ibn Mājīd which was appropriated by Da Gama and made its way to Lisbon, to be eventually incorporated into the earliest northern European nautical treatises—this merits detailed verification through comparative work, which is currently under way by the RUTTER team.

We list below the forty-one works currently attributed to Ibn Mājīd, considering three major and the rest of minor importance, sometimes only because of their extent. There has been some variation in this tally among authors and over the years, but everyone agrees on the primacy of the three works we list first here below.

2.5.1 Al-Fawā’id fī uṣūl ʿilm al-bahr wa-al-qawāʾid

Addenda on the Principles and Foundations of Maritime Science

This work, a collection of twelve chapters on various topics of Indian Ocean navigation, has long been considered Ibn Mājīd’s most important text. There are two critical editions apart from the facsimilar French edition made by Ferrand in 1920. The twelve divisions of the text are called fawā’id, “useful texts”, or “addenda”, because they are conceived as appendages, practically footnotes, to a long tradition of nautical treatises, and most likely also, in line with the authors’ claims, because they are accessory to the practical expertise, not to be considered self-sufficient, but only a support for expert mariners. Here is a list of contents of the Fawā’id:

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8Found in B1, K1, Oxon.2, P2, W1.
I – History of navigation from Noah to Ibn Mājid’s time; II – The qualities of the pilot (*muʿallim*); III – The lunar mansions; IV – The compass rhumbs; V – Classical astronomers and geographers; months of the Roman year; VI – Maritime routes: coastal and high sea routes; VII – Measurement of stellar altitudes (*qiyyās*); VIII – Landmarks (*ishārāt*); policies (*siyāsāt*) of the navigator; IX – Description of the world’s coasts; three types of pilots; X – The world’s ten biggest islands; XI – Monsoons; XII – The Red Sea.

**Editions and Studies:**


A three-volume edition of Ibn Mājid’s and Sulayman al-Mahrī’s works found in P1 and P2. The first two volumes were published in 1921 and are facsimiles of the manuscripts. The third volume was published in 1928 and became only part of what was originally proposed. Beginning with a reedition of articles by Prinsep, Concreve and Saussure on navigation and nautical science, the volume continues with Ferrand’s chapter on the three known authors: Ibn Mājid, Sulaymān al-Mahrī and SīdīʿAlī Çelebī. At the end, there is a small glossary with a few technical terms.


With several indices, well annotated, comparing three Mss., this is still, in spite of some criticism by Ḥ.Ṣ. Shihāb, the best critical edition of the *Fawāʾid*. It relies on B1 for most readings.


An extensive analysis of the *Kitāb al-fawāʾid*, including both an English edition of the text and a study on Arabic navigation. Based on a comparison between P1 and D1, Tibbetts’ translation is the first and so far only English translation of the book. It has certain discrepancies with the readings in Khoury’s and Shihāb’s editions. Regarding navigation, the book begins with an introduction to Arabic authors and works until the end of the sixteenth century, and continues in another chapter on navigation techniques. Additionally, there is also a detailed topographical study of the Indian Ocean and the Red Sea which –along with the glossary on nautical terms– is of great utility to the lay reader.

This is an edition of the Fawāʾid from the facsimile edition of Ferrand, accompanied by a Russian translation (Tolmacheva 1994, 123).


This is a facsimilaredition of K1, with a little useful introduction, locating it in the editorial history of the book. The author expresses his desire, still unfulfilled, for a new critical edition of the Fawāʾid to be produced incorporating K1 and Oxon 2.


This is the second edition of the same title by Shihāb, and the most recent edition of the Kitāb al-fawāʾid, based on collation of all the known manuscripts with the exception of Oxon 2. Some mistakes seem to have crept into the final text, and it should be consulted judiciously.

2.5.2 Al-Ḥāwiyat al-ikhtiṣār fī ʿilm al-biḥār

The Comprehensive Summary on the Principles of the Knowledge of the Seas

Written in 866/1462 with 1082 verses, this is Ibn Mājid’s most extensive poem. Here he presents for the first time the majority of the themes discussed later in the Fawāʾid. How do these works resemble and differ from one another? Probably the most thorough comparison between the two works was produced by Khoury (2001), whose conclusion is worth briefly noting here. Considering the complexity of the Ḥāwiyah in terms of content and form, Khoury argued that this must have been the work Ibn Mājid regarded as his best. Written in a language quite distant from the marine jargon used at the time—in a language which would require “un effort considérable de toutes les facultés mentales d’un maître bien formé” (1985, 3)—it seemed unlikely that it would have been meant to assist pilots at sea. On the contrary, Khoury believed that the reason for writing such a complex poem was—first and foremost—Ibn Mājid’s ambition of being eternally celebrated. This argument, however, flies in the face of a centuries-long tradition of using verse to convey highly technical knowledge, from Ancient Greek through Latin, and with not few examples in Arabic literature (Dunsch 2012, 6).

Back to al-Ḥāwiyah, the work is divided into eleven chapters:

I – Landmarks (iṣḥārāt). Knowledge and preparations of the pilots; II – The lunar mansions and the rhumbs; III and IV – Elevations of the stars, the bāshī (distance of the pole star to the actual pole), and the rules for the observation of specific stars; V – Maritime routes in the Arabian Peninsula’s coast; VI – Maritime routes in Africa’s oriental coast; VII – Maritime

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9Found in B1 (1082 vv.); D1 (1067 vv.); P1 (1073 vv.); P2 (904 vv.); W1 (1067 vv.).
routes in Asia’s south and southeast coasts; VIII – The maritime distances between the Arabian Peninsula’s coast and different points in South Asia, especially in India; IX – The altitude of the pole star, the two guardians, and the Ursa Minor for the main points in the Indian Ocean; X – Useful practices for the pilot at sea; XI – A thorough review of the distances in high sea (zām), of the zodiac signs, the hours, the binary star, the precursor signs of big storms, and, finally, a conclusion where Ibn Mājid puts the specific date and the number of verses in each chapter.

Editions and Studies:
This text has been published four times (al-Ghunaym 2006, 268) in the following order.

This edition by Shihāb was based on a newly found Omani manuscript which contained two previously unknown works. It is remarkable that it was produced two years before the following edition by Khoury, who could have profited from the new Ms.


Khoury published this new edition basing himself on the three Mss. used for his edition of the Fawāʾid. It has been reprinted, and it includes an English translation of the poem (al-Ghunaim 2004, 268).
2.5.3 *Al-Sufālīyah*

“*The Poem of Sofala*”

As per the section on manuscripts above, this poem is found in a single manuscript, namely Pt1. Written in 807 verses, this copy is mostly dedicated to navigation in the Oriental coast of Africa—from Cape Guardafui to the South of Sofala. Additionally, it includes a few passages concerning the presence of the Portuguese in the Indian Ocean. Reading the poem in its entirety, Shumovsky was led to the same argument that Ferrand had proposed years earlier, namely that Ibn Mājid had been the Arabic pilot who took Vasco da Gama to India. After the publication of the Russian edition in 1957, Shumovsky’s reading remained unchallenged until 1983, when Khoury translated the poem to English. According to Khoury, the copy in Pt1 included several interpolated passages that were later additions made by the copyist. Once these are removed, the result is a well-structured poem with 701 verses, divided in five parts:


**Editions**


An edition of the three poems found in Pt1: *al-Sufālīyah, al-Maʿlaqīyah* and *al-Tāʾīyah*. The book includes an introduction, photographs of the Petersburger manuscript, and a translation from Arabic to Russian. According to Khoury, Shumovsky has the merit of being the first western scholar to dare translate the nautical poems, which are the core of the Arabic nautical tradition (Khoury 2001, 203). The Russian text was eventually translated into Portuguese by Myron Malkiel-Jirmounsky in 1960 (see next entry), and the edition of the text spawned the following Arabic publication.


Considering that Shumovsky’s translation had interpretation mistakes, ambiguities and—most importantly—that it could not account for the alien verses inserted

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\(^{10}\)Found in Pt1 with 803 verses.
by the copyist, Khoury’s article includes a critical analysis and an English translation of *al-Sufāliyah*.


In an edition of the known *urjūza* poems by Ibn Mājid, Khoury began with an analysis and edition of *Al-Sufāliyah*. This article thus offered, for the first time, a critical Arabic text of the poem.

2.5.4 Minor Metrical Treatises

Several *arājīz* (pl. of *urjūza*) on specific topics of maritime sciences.


**Edition:**

*Barr al-ʿarab fī khalīj fāris* “Poem of the Arabic Coasts on the Persian Gulf”. 100 verses. Found in P1; W1. A description of the sea route from Basra to the strait of Hormuz.

**Edition:**

*Ḍarībat al-ḍarāʾib* “The Assembly of the Analogues”, on the stars that are useful for navigation. 192 verses. Found in P1 and W1. Verses 97 and 98 are missing in P1.

**Edition:**


On astronomical navigation. The poem begins with an explanation on the longitudes, the rhumbs, *zāms* and the *tirfah*, then mentioning specific stars and their altitudes. It ends quoting *al-Fawāʾid* and listing sixteen of Ibn Mājid’s poems, five of which are lost.

**Edition:**
Al-Fāʾiqah fī qiyās al-ḍafdaʿ al-awwal wa-qayduhu suhayl  “The Eminent Poem on the Measure of Fomalhaut When Canopus is Fixed”. 59 verses. Found in P1; W1; Oxon. 1. Verses 19 and 20 in Oxon. 1 are missing in P1 and W1.

Edition:


Edition:

ʿIddat al-shuhūr al-rūmīyah wa-kullu shahr kam huwa  “The Number of The Byzantine Months and the Days in Each Month”. 13 verses. Found in P1. The Julian months: their names, number of days and distribution in four seasons.

Edition:

Kanz al-maʿālimah wa-dhakhīratuhum fī ʿilm al-majhūlāt fī al-baḥr wa-al-nujūm wa al-burūj wa-asmāihā wa-aqṭābihā  “Treasure and Provision of the Pilots on the Unknowns at Sea, on the Stars and the Constellations, Their Names and Their Poles”. 72 verses. Found in O1, P1, W1 and Oxon. 1. The first verse in P1 is written in prose in W1. According to al-Ghunaim, the second hemistich of the verses 29 and 30 and the first hemistich of verse 31 are missing in Oxon 1.

Edition:

Kitāb al-fuṣūl  “Book of the Divisions”. Found in P1. Some prose lines on several topics at the end of the manuscript. Unpublished to date.

Al-Makkīyah  “The Mecca Poem”. 172 verses. Found in P1 and W1. The second hemistich of verse 59 and the first hemistich of verse 60 are missing due to a copist mistake. A description of the sea route from Jeddah to cape Fartak, and from there on to several different ports.

Edition:


Edition:
Manāzil al-qamar  “The Lunar Mansions”. This poem is found both in D1 and P1. In the Paris Ms. it has the full title Fī maʿrifat al-manāzil wa-ḥaqiqatihā fi al-samāʾ wa-ashkālihā wa-ʿadadihā (“On Knowledge of the Mansions, their Ascertainment on the Sky, their Shapes and Number”), and it is attributed to ʿAlī ibn Abī Ṭālib.

Edition:


Edition:
Khoury 1985–86, 205–207 (Ar. 70–72).


Edition:


Edition:

Al-Mukhammasat al-istiwāyāt  “Quintets on the Moderations”. 17 strophes. Found in P1 and W1. About the stars which indicate the position of Polaris. As indicated by the titles, this poem has an interesting fivefold structure, with every four hemistichs ending with a fifth one as a refrain for the pilots: “Ponder and ask for advice, and wake the night and be resolute.”

Edition:
Khoury 1985–86, 201–204 (Ar. 73–76);

Fi musāyarat al-arḍ min ʿadan ilā jiddah  “Going by Land from Aden to Jeddah”. 119 verses. Found in Oxon. 1, fols. 12v.–16r. Unpublished to date.


Edition:

Edition:


Edition:
Shihāb 1993.

Qad ṣadaha al-dīk  “The Cock Has Crowed”. 49 verses. Found in Oxon. 1. According to al-Ghunaim, this poem presents the altitude values of several stars. Unpublished to date.


Edition:

Fi qismat al-jummaʿ alá anjum banāt naʿsh  “Division of the Surface of the Sea According to the Stars on the Ursa Major”. 221 verses. Found in P1 and W1.

Edition:

Al-Sabʿiyah  “The Poem of the Seven Nautical Sciences”. 307 verses. Found in P2 and Oxon. 1. According to al-Ghunaim, verses 75 and 165 are missing in Oxon. 1.

Edition:
Khoury 1987–88, 272–254 (Ar. 50–69), excludes the verses 227 and 228.


Edition:

Edition:


2.6 Sulaymān al-Mahrī (early 16th century)

Very little is known about the person of Sulaymān ibn Aḥmad ibn Sulaymān al-Mahrī, a native of Shiḥr, on the Yemeni coast, halfway between Aden and the Omani border. Some of his works were translated into Turkish by Çelebī, who tells us that al-Mahrī was no longer alive in 1554. Al-Mahrī is thematically a direct heir, and according to legend a direct pupil, of Ibn Mājid, whom he quotes in his work. Eventually they would be copied together in nautical collectanea like P1, thus testifying to a clear complementarity.

2.6.1 Minhāj al-fākhir fī ʿilm al-baḥr al-zākhir

Precious Method on the Science of the Rising Sea. Found in B1; Le1; O2; P2; Y1; also in Peshawar. Khoury (1970) divides it in an introduction followed by seven chapters and a conclusion:

Introduction – Explanation of the ẓām and the tirfah; I – Bearings of known and populated lands, with some pages about high sea routes; II – Root latitude and other latitudes; III – A description of the islands with their latitudes; IV – Distance based on polar latitude and the Two Calves (β and γ Ursae minoris); V – On winds and perils; VI – On signs near the lands; VII – On the passage of the sun and the moon through the zodiac signs and the lunar mansions; Conclusion – Description of trips to Diu, Malacca, and other ports.

Editions and Studies:


2.6.2 Al-ʿUmdat al-mahrīyah fī ḍibṭ al-ʿulūm al-baḥriyah

“The Reliable Mahri Treatise on the Exactitude of Maritime Sciences”. Dated 1511. Found in Le1; P2; Y1; also in Peshawar. It is divided in seven chapters:
I – Principles; II – Names of the stars and what is associated to them; III – Navigation “on the wind” and “under the wind”; IV – About the islands and their bearings; V – Latitudes of well-known lands; VI – Monsoons in the days of Nairuz; VII – Travelling various routes.

Editions and Studies:

2.6.3 Other Works:

Mirʾāt al-salāk li-kurāt al-aflāk

“Mirror of the travellers[?] on the Spheres of the Orbits”. Found in Y1. Unpublished to date.

Qilādat al-shumūs fi ‘ilm al-tawārikh


Editions and Studies:

Tuḥfat al-fuḥūl fi tamhīd al-uṣūl

“The Worthy Men’s Classic on the Introduction to the Principles”. Found in P2; Q1; Y1. Only 6 folios. As some of the previous works, it includes a section on “two kinds of sailing at sea, i.e., following the coast line or crossing the high seas.”

Editions:

Sharḥ tuḥfat al-fuḥūl fi tamhīd al-uṣūl

“A Commentary to the Tuḥfah”.
Found in P2.

Editions and Studies:
2.7 Seydi ʿAlī Çelebī (16th century)

Seydi Ali Çelebi (1498–1563), also known as Seydi Ali Reis, Sidi Ali Ben Hossein, and Katib-i Rumi, was an Admiral of the Indian Ocean fleet. In contrast to the previous two authors, his life is relatively well documented by modern historians. Çelebi was born into a family of mariners and received his nautical education by sailing in the Mediterranean, under the chief Admiral of the Ottoman fleet. His nomination followed the death in 1553 of Admiral Piri Reis, who had left fifteen galleys in Basra. That same year, he was sent by Suleiman I to bring the galleys back to Egypt, but was stopped by a Portuguese attack in the Persian Gulf. Çelebi was forced to take the Ottoman fleet to Gujarat in 1554, remained there for a year (Tibbetts 1971, 44), and returned to Istanbul by land.

A detailed account of his literary corpus can be found in Danişan 2019. Çelebi produced three main treatises: Hülasatü'l-Hey’e (Epitome of Astronomy), which is a translation of al-Qushjī’s Al-Fatḥiyah with additional sections on geography; Al-Muḥīṭ (The Book of the Ocean) in 1554, which is mainly a translation of al-Mahrī’s ʿUmdah, as discussed below; and Mir’atü'l-Memalik (The Mirror of the Countries) in 1557, which is an introduction to several astronomical instruments. Al-Muḥīṭ was thus produced during Çelebi’s stay in Gujarat, when he was already acquainted with astronomical matters and claimed to have in his possession ten Arabic works on navigation and geography (von Hammer 1834, 546). Yet, when commenting on Al-Muḥīṭ, Tibbetts noted that it contained several translation mistakes which could only lead “to the conclusion that Sidi Çelebi had no real knowledge of what his texts were dealing with” (1971, 45). How could this be? The answer may be related to Çelebi’s education. Having been trained in the Mediterranean, he was unfamiliar with the problems and techniques related to Indian Ocean navigation. Çelebi realized this when, during his journey from India to Istanbul, he and the Ottoman fleet were lost in the Ocean (Danişan 2019, 3–4). Although it is not clear if such an experience is behind Çelebi’s motivation to translate the Arabic works, it probably helps clarifying why he struggled to understand their content.

The important and immediate precedent of Piri Reis’ Kitab-ı Bahriye (Book of Navigation), whose contents overlap to a certain extent with the Muḥīṭ, should be the subject of a detailed collation.

2.7.1 El-Muḥīṭ fi ʿIlm el-eflak veʾl-ebhur (in Turkish)

Book of the Ocean on the Science of the Spheres and the Seas. Mss. in Süleymaniye Library, Aya Sofya ms. 2591; and National Library of Austria, N.F. 184 (external link); allegedly also in Naples.

Composed in 1554, “this is the most recent work extant on the methods of navigation used in the Indian Ocean in the Ibn Mājid tradition.” Following what has been described above, Çelebi claimed to have before him ten Arabic works on navigation and astronomy, six of which originally composed by Ibn Mājid and Sulaymān al-Mahri. According to Tibbetts, Al-Muḥīṭ is mainly a Turkish translation of al-Mahrī’s ʿUmdah, with additional passages from the other
works and comments in specific sections. It is composed of ten chapters:

I– Names of the skies and stars, of the elements and what belongs to them; II– Foundation of the solar and lunar years; III– Divisions and subdivisions of the compass, the rhumbs and the tirfā; IV– Sea routes along the coast above and below the wind of Cape Comorin, the islands and America; V– Maritime calculations and technical terms; VI– Altitude of specific stars in order to determine the latitude of a place; VII– Distances between different ports. According to Tibbetts (1971, 45), it includes a collection of charts and maps which are not mentioned in any of Ibn Mājīd’s or al-Mahrī’s works; VIII– Winds and monsoons; IX– Notice of certain islands and voyages, and the signs of vicinity of land; X– Accidents and dangers to look out for, and of hurricanes (von Hammer 1834, 516-17; Ferrand 1925, 252-254).

Editions and Studies:


The first of four articles concerning al-Muḥīṭ. It is one of the earliest modern publications concerning texts on Arab navigation and mentioning Ibn Mājīd, Sulaymān al-Mahrī—whose works Çelebī claims to have gathered and translated in Al-Muḥīṭ. Beginning with a small introduction, where the titles of the ten chapters are listed, the article then continues with von Hammer’s translation of Ch. 8: “Of the Winds and Moonsons.”


The article is dedicated to the English translation of the ninth chapter of Al-Muḥīṭ: “Containing an explanation of some Islands and Voyages, and precautions, the knowledge of which is requisite for Navigators in the Indian Seas”. Being one of the earliest modern works on Arab navigation, the article begins by stating the major difficulties placed to the reader: along the text there are several terms and names with no modern correspondence. Thus, what von Hammer’s article proposes is a beginning: it begins to enquire about both the names of the places and the technical terms that are mentioned in the text—such as the zabām, Ḭṣbā and the qiyās. The chapter is divided into three sections: “Islands of the Arabian Coast”, “Islands of the Persian Coast”, and “Voyages and Indications of Nearby Coasts”—the last of these being a description of thirty sea voyages.

A translation of *al-Muḥīṭ*’s tenth chapter: “Of certain truths founded on reason and experience; and of hurricanes.”


A translation of *al-Muḥīṭ*’s first chapter: “Names of the skies, and the stars; of the elements and what belongs to them.” The chapter is divided in nine sections, beginning with one “on the skies, stars and the elements” and increasingly dealing with astronomical navigation through the introduction of the *iṣbaʿ*, the *khān* (the rhumbs), and the “instruments of measurement”—all required for the calculation of the distance of the stars. The article ends with a note by James Prinsep, which is dedicated mostly to the names of stars mentioned in *al-Muḥīṭ*.


These articles reproduce two chapters and some sections of the *Muḥīṭ*’s Turkish text, based on a collation of the Vienna and Naples Mss.

3 Secondary Sources

In recent years (approx. the last fifteen years), some important works have been published in Arabic and stayed off the radar of European scholarship, with a few exceptions like Agius, who is acquainted with the works by Shihâb and other sources. The following list aims at being thorough, but it does not claim to be fully comprehensive; interested readers are advised to consult in particular the bibliographies of ʿAbd al-ʿAlīm, Malhão Pereira, Mathew, Shihâb, and Staples.

Authors names are ordered alphabetically, with their titles in chronological order. Authors in boldface are deemed to be of particular importance. The bibliographic entries for medieval authors are found above; see the individual names under Main Works and Authors.


Prof. Agius has an extensive list of publications, some quite recent, mostly on the vessels and on Mediterranean and Red Sea matters, but also a lot of work on Gulf navigation. Follow this link for his list of publications at the University of Exeter. The following are the ones most relevant to our present topics.


The article looks for an identity among Oman seafaring communities. It begins with an historical account regarding the seascape, trade routes and port towns of Oman and ends with a discussion on “identity, ethnicity and linguistic diversity from early to late medieval Oman.” Of particular interest is the bibliographic information the author gives in the first part, regarding sources on early navigation in the Indian Ocean. The article discusses the Persian and, later, Arabic trading routes with China. The main sources mentioned are: Sulaymān al-Tājir (9th century); al-Masʿūdī (10th); Buzurg ibn Shahriyar (11th century); Ibn Khurradādhbih—*Kitāb al-masālik wa al-mamālik* (*The Book of Routes and Lands*)—(13th century).


Section 4 has some relevant paragraphs about the influence of Ibn Mājid. He draws from Juḥā (see below). Unfortunately it rehashes the fallacious legend of Da Gama and Ibn Mājid meeting.


This is the most important reference addition to the literature in recent times, being fully bilingual in Arabic and English, based directly on primary Arabic sources, taking into account all major and some rare secondary sources, and introducing several corrections and updates to previous works.

• Aleem, Anwar A., see ‘Abd al-ʿAlīm.


This is an extensive article in an encyclopaedia of Shia personalities. A good part of it is devoted to the matter of Da Gama’s piloting to India, and especially the related comments of the renowned sixteenth century author al-Nahrawālī (cf. Khoury 1971, 16).


- Canavas, Constantin. “Compass”. In Encyclopaedia of Islam, THREE. doi: http://dx.doi.org/10.1163/1573-3912_ei3_COM_25561.


This article compares the empirical methods of medieval Arab navigators on the Indian Ocean for determining latitudes with modern stellar methods.


Dr. Danışan can read Ottoman Turkish and thus has access to an important number of little known premodern sources. Her tangential treatment of Seydi ‘Ali Reis (Çelebi in previous nautical literature) is a welcome updated take on the author of the *Muḥīṭ*.


Though this comprehensive PhD thesis is devoted to the instruments, there are several important references to Arab and Indian pre-modern developments in general. See especially Chapter 3.


This work of Ducatez was inscribed in the activities of the French MEDIAN project (Les sociétés méditerranéennes antiques et les mondes de l’océan Indien), and particularly related to the APIM (Atlas des Ports et Itinéraires Maritimes de l’Islam Médiéval) database, two initiatives greatly relevant to this field of studies. Another closely related French initiative is the Islam médiéval research unit, within the context of the larger research project Orient & Méditerranée.


This article includes a tentative and summary comparison between one ancient author and Çelebî’s Muḥīṭ.


This important author is backed, like Malhão Pereira, by his nautical experience; his treatment of technical issues, added to his direct access to Arabic sources, is
very valuable. He decries the lack of sources prior to Ibn Mājid, and yet, being a sailor and thus sensitive to the practical continuity of the techniques, he affirms that “la fréquentation prolongée de ces livres amène insensiblement à oublier que leurs auteurs vivaient à la fin du Moyen-Âge” (1972, 252).


A very uneven and at times pointless article, devoid of citations, but still one or two useful references.


This little gem of a book continues to be the most comprehensive reference for Arab navigation from antiquity to early modern times. It is a treasure trove of sources from very diverse origins; some are rather outdated now, but its general guidelines are fundamental.


This brief article is based on Shihâb’s 2013 edition, and it seems to be the most recent published update on the Fawâ‘id status questionis.

- Khoury, Ibrahim.

In the early 1970s, K. produced a very important set of Arabic critical editions entitled collectively Al-‘Ulūm al-baḥrīyah ‘inda al-‘arab (Maritime Sciences Among the Arabs). Vols. 1 to 3 (counted as 1.1, 1.2, and 1.3) contain works of Al-Mahri, and Vol. 4 (actually 2.1) is the edition of Ibn Majid’s Fawâ‘id.


• King, David. 2019. “Finding the Qibla by the Sun and Stars – A Survey of the Sources for Islamic Sacred Geography (Masḥ kutub dalāʾil al-qiblah).”

Prof. King has an extensive bibliography which for its breadth and depth can be considered a standard on Islamic astronomical themes.


In a book dedicated to the history of Bahrain, Kunitzsch argued for the value of Kitāb al-Fawāʾid as an historical source by translating a passage of the tenth fāʾi-dah. Looking into Ibn Mājid’s description of Bahrain, Kunitzsch concluded that, although the geographical informations seem to have been based on older works—the main ones being Taqwīm al-buldān by Abūʾl-Fidā (d. 721/1321) and Tārīkh al-mustabṣir by Ibn Mujāwir (d. 690/1291)—the political descriptions seem to derive from Ibn Mājid’s own experience. Kunitzsch’s translation was based on Khoury’s edition, and it draws attention to interpretation mistakes found in Tibbetts. Three manuscripts are mentioned: P1, D1, and B1.

• Lafitte, Roland. 2014. “Le ciel austral des Arabes aux Portugais vers 1500.” Online article of the author’s talk at the Symposium des planétariums, Lucerne, May 2014.

There are a number of other relevant and well-informed articles by this author on the same website of the link above.


Malhão Pereira has accumulated over the years a large collection of articles on many historical and technical aspects of navigation, all backed up by decades of nautical experience. These works should be considered a primary reference, in that they combine rigorous historical acumen with a keen eye for technical subtleties which tend to escape the attention of lay authors. Most of his articles have been collected in three volumes of Estudos published by the Portuguese Navy. We cite here below only some of the most relevant titles.


Mathew is a key reference for navigation and sea-trade matters related to the west coast of India and Sri Lanka in particular. He makes extensive use of archaeological findings, and he is critical of previous Eurocentric approaches in the discipline.


This book gives access to a wealth of precious references to Arabic, Persian, and Indian languages sources.


Both titles by this author contain valuable firsthand information about Arab-Chinese maritime exchanges.


The history of the Indian Ocean encompasses many facets naturally linked to one another. While navigation presupposes knowledge related to shipbuilding, instrument use and orientation at sea, the initial decision to navigate along specific routes is often related to trade, religion and politics. Pearson provides a narrative of such a history. Of particular interest for us are chapters 3 to 6, covering navigation down to the Early Modern period. Regarding Arabic, Indian and Chinese navigation, chapters 3 and 4 cite a variety of multicultural sources on travel literature, among which are the accounts by Ibn Jubayr, the twelfth century geographer, on Arab sailors and ships.


See in particular chapter 5: “Exploring the Essence of the Navigational manuals”; and ch. 6: “Navigation Wisdom of Arabs and Portuguese in Pre-modern Kachchhi”. Prabha Ray has here and elsewhere valuable work on the impact of Buddhism in the development of Indian and South Asian maritime trade during the Middle Ages.

This article intends to shed light on some misnomers and misconceptions arising from the encounter of Arab, Indian and Chinese maritime traditions.

The article presents and comments two early Arabic treatises on the magnetic compass: one written by al-Ashraf ʿUmar ibn Yūsuf (ca. 1290) and the other by Ibn Simʿūn (ca. 1300). Schmidl argues that, while earlier sources on the magnetic compass can be put in the context of navigation, these two works are the first to discuss their use in finding the qiblah.

The article begins with a survey of the early Arabic sources on the magnetic compass, and there are two works worth mentioning here. The first is the Persian anthology ʿJāmiʿ al-ḥikāyāt (Compendium of Stories), by Sādī al-Dīn Muḥammad ibn Muḥammad Bukhārī (also known as Awfī). It describes the compass during a sea voyage in the Red Sea or the Persian Gulf in 1232/33. The second is the Kitāb kanz al-tujjār fī maʿrifat al-aḥjar (Treasure of Merchants about the Practical Knowledge of the Stones) (1282) by Baylak al-Qibjāqi, which mentions a voyage from Tripoli to Alexandria. According to Schmidl, the latter is “the first description of the use of the magnetic compass for nautical purposes in the Islamic world.”
cover a great range of topics, both temporally and geographically. Schottenhammer is director of a thematically related project, the Crossroads Research Centre, with a main focus on China, and more broadly on the interaction, communication and exchange relations in the macro-region of Eurasia, East Asia, the Asia-Pacific and Indian Ocean Worlds.


Shihāb is the most important recent author on the Arabic nautical tradition, particularly because of his editions of Ibn Mājid’s Fawāʾid and his dictionary of technical terms.


The work consists of three parts, the second of which is of interest here. It includes eight chapters on Arab navigation and is called "Abhara’s World", after the name of the historical pilot described in Kitāb ʿajāʾib.


This article is a most valuable and recent contribution to the literature, going over previously treated topics, in particular quite technical aspects of nautical astronomy, with the added experience of the 2008 Jewel of Muscat international project. Staples draws attention quite rightly to the highly interactive and ever culturally plural nature of western Indian Ocean navigation.

——— See also under Al Salimi.


Tibbetts continues to be the primary English-language reference for a specialised study of the main Arabic navigation sources. In addition to the titles below, see his thoroughly annotated translation of the Fawāʾid above.


These multidisciplinary and truly international conference proceedings are divided in three parts. Part I: Historical, cultural and commercial contacts across the Indian Ocean; Part II: The settlement of Madagascar and neighbouring islands; Part III: Indian Ocean studies.


This is a precious witness to the vitality of the Indian nautical tradition and of its inextricable relation to the Arabic literature. The Rahmani in question is the written collection of nautical instructions transmitted orally in Lakshadweep (formerly Laccadive Islands) for centuries. The edition includes a facsimilier reproduction of the original text, in a mixture of Arabi-Malayalam, Malayalam, and Arabic, and an annotated English translation. We are most grateful to Cmdr. Malhão Pereira for sharing with us this rare source, as well as information on other valuable publications by Varadarajan.

- Vernet, Juan. 2006. Lo que Europa debe al islam de España. Acantilado.

A good section on “Náutica” in this work about Islam and Spain, with valuable references.


## 4 Websites

We are listing here only major sites which act as hubs for many related particular projects and institutions.

- **Crossroads Research Centre**

  Focusing primarily on China, and more broadly on the interaction, communication and exchange relations in the macro-region of Eurasia, East Asia, the Asia-Pacific and Indian Ocean Worlds. They apply a parallel comparative analysis of both archaeological and textual evidence and a cross-cultural inter-disciplinary approach.
Indian Ocean Research Group
Based at the University of Adelaide, Curtin University, Australia, and South Asian University, India, with members from all over the world.

Indian Ocean World Centre (IOWC, McGill University)
Based in Toronto, it is a research initiative and resource base established to promote the study of the history, economy, and cultures of the lands and peoples of the Indian Ocean world (IOW)—from China to Southeast and South Asia, the Middle East and Africa.

Indian Ocean Worlds
Based at the University of California, Davis, this is Mellon Research Initiative called “Reimagining Indian Ocean Worlds.” It will produce long lasting, multi-year interest and capacity to become a hub for rethinking the scope of emerging Indian Ocean Studies.

Leiden Centre for Indian Ocean
Netherlands-based, a global platform for scholars working on connections and comparisons across the Indian Ocean. Interested in scholarship that cuts across borders of places, periods and disciplines.

MEDIAN project—Les sociétés méditerranéennes antiques et les mondes de l’océan Indien
Directed by Pierre Schneider, this project is based at Artois University since 2017.

5 Audio / Videos


The Jewel of Muscat, two-part documentary on the archaeological reconstruction and sailing of a ninth-century type boat from Oman to Singapore. Part 1 and Part 2.

“Mémoire Maritime des Arabes / Maritime Memory of the Arabs”, documentary directed by Khal Torabully, 2010.
RUTTER TECHNICAL NOTES SERIES

No. 1 — Luana Giurgevich
Bibliotheca Roteirística: Edições Impressas em Portugal nos séculos XVII e XVIII

No. 3 — David Salomoni
Jesuits on Board: A Reasoned Bibliography on the Early Modern
Jesuit Trans-Oceanic Sailing Experiences

No. 4 — Nuno Vila-Santa
The Portuguese India Run (16th–18th centuries): A Bibliography