Arab Seafaring

IN THE INDIAN OCEAN IN ANCIENT AND EARLY MEDIEVAL TIMES

BY

George Fadlo Hourani

OCTAGON BOOKS
A DIVISION OF FARRAR, STRAUS & GIROUX
NEW YORK 1975

PREFACE

THE history of seafaring by the Arabs is a subject of wide extension in space and time, fragments of which have been dealt with in a great number of scholarly articles and chapters. This book is intended to provide a general and continuous account of about a quarter of the subject. In space I have limited myself to Eastern waters, with only a brief excursion into the Mediterranean, where Arabs have been sailing since the beginning of Islam. Such a division can be justified by the many contrasts between the two seas and the lands bordering them in past times: geographical conditions, contacts with other nations, types of ship, methods of navigation were all different. In time, I have dealt with the earlier period: the historical account in the first two chapters extends down to A.D. 1000 or thereabouts, although the third chapter ranges some centuries later.

This book is a history of trade routes in the Indian Ocean and of the ships which sailed on them. But it is not an economic history, and the products carried as cargoes are mentioned only incidentally. I have even made little use of the known facts of commercial intercourse between various countries as evidence for the history of navigation. The reason is that this commercial evidence, taken by itself, tells us nothing about our subject beyond the bare existence of navigation. If articles of Indian manufacture are found in Babylonia and dated to a certain period, well and good: but we still want to know whether they were carried there by Indians, or Babylonians, or an intermediary nation like the Arabs of 'Umān. Nor is this a history of "navigation" in the technical sense, a subject which could be adequately treated only by a trained navigator.

These are the principal limits, of matter or method, which I have imposed on my work for one reason or another. On

the other hand, in one respect this book goes beyond what its title suggests. I have wandered freely into the nautical history of other nations besides the Arabs: largely in order to show the historical background and environment of Arab efforts, but also because it is sometimes difficult to draw a sharp line between nations, when once they get onto the sea and mingle in the ports.

This book was begun as a doctoral thesis for Princeton University in 1938-1939, entitled "Arab Navigation in the Indian Ocean in the Ninth and Tenth Centuries." My first debt of gratitude is to the wise guidance which I received at Princeton from Professor Philip K. Hitti and Professor Harold H. Bender—indeed it was Professor Hitti who first suggested Arab seafaring to me as a subject demanding investigation. That thesis has been rewritten and expanded to form the present book. I worked on it during vacations at Jerusalem, where the Director and library staff of the Palestine Archaeological Museum gave me every facility. I owe much to the suggestions and criticisms of other scholars and friends who will, I hope, be satisfied with this general acknowledgment; as well as to the researches of Mr. Alan Villiers, the late Professor Gabriel Ferrand, the late Mr. James Hornell and others whose writings are mentioned in the notes. Thanks are also due to the authors or publishers who granted permission to quote from copyright works. I also wish to thank the Editor of the *Journal of the Royal Asiatic Society* for permission to reprint the Appendix to Chapter I, parts of which appeared in an article in the *Journal* in Dec. 1947.

For my illustrations I owe the following acknowledgments and thanks: To Mr. A. J. Villiers for allowing me the use of his own photographs in Plates 1 and 8; to the Director of the Bibliothèque Nationale for the photographs of Plates 5, 6 and 7, and permission to reproduce them; to the Director of the Palestine Archaeological Museum for the photographs of Plates 2 and 3, taken from books in the Museum library;

to the publishers of these two books, H.M. Stationery Office and P. Payot; to the Oxford University Press for photographing Plate 4; and to the same Press and His Exalted Highness the Nizam of Hyderabad for permission to reproduce this plate.

I am grateful to Princeton University Press for their patient work in preparing the text, maps, and illustrations.

My final thanks are due to my parents for the opportunities of study at Princeton which they provided, and to my wife for constant encouragement to complete this book.

G. F. HOURANI

Ann Arbor, August 1950

CONTENTS

PLATES

MAPS

NOTE

All words of other scripts are transliterated into the Latin script, except in quotation of poetry or in connection with textual criticism.

Greek names and words are transliterated in the traditional Latin way, "Coptus" for Κόπτος, etc. Arabic names and words are transliterated according to the system used by Dr. Hitti in his *History of the Arabs.*

In quoting passages from the sources in English translation, I have used existing translations, where these are available, as bases for my own versions. Where this is done, the names of the translators are mentioned in the notes on the first occasion only. But I have not hesitated to emend a translation whenever the original seemed to require a different rendering.

References for quotations are given in the notes, followed by the word "(quoted)."

Titles of books and articles are given in full at the first mention.

I

TRADE ROUTES IN THE PRE-ISLAMIC ERA

كأنّ حدوج المالكيّة غدوة خلايا سفين بالنواصيف من دد
عدولية او من سفين ابن يامن يجور بها الملّاح طوراً ويهتدي
يشقّ حباب الماء حيزومها بها كما قسم الترب المفائل باليد

When the lady of Mālik rides her camel at dawn, her litter appears like a large ship in the midst of the valley of Dad, one of the ships of Adulis or of ibn-Yāmin, which the mariner now turns aside and now directs straight ahead; its prow cuts through the foam of the water as a gambler divides the dust with his hand.—Tarafah, *Mu'allaqāt*, II, 3-5

PREHISTORY AND GEOGRAPHY

Long before history Arabs,[1] like the rest of mankind, were making boats of skins, hollowed tree trunks, or other suitable material, and paddling or punting their way across easy waters. They went fishing on the sea, and began diving for pearls; perhaps they learned to row with oars. Out of these simple activities navigation in the proper sense developed, as

[1] In this book "an Arab" means anyone who speaks Arabic, "a Persian" anyone who speaks Persian; "an Arabian" means an inhabitant of Arabia, "an Iranian" an inhabitant of Iran. In the pre-Islamic period all Arabs were Arabians, except some tribes in the Egyptian desert between the Nile and the Red Sea; and all Arabians were Arabs, if we include Ḥimyaritic and other South Arabian dialects as branches of Arabic. After the Islamic expansion, an Arabic-speaking inhabitant of Iran may be termed either an Arab or an Iranian; a Persian is one who continued to speak Persian. But we do not always know what language people spoke at home, so that there is bound to be a margin of choice in the use of these terms in some cases.

men ventured further onto the sea. But this book is not concerned with that obscure evolution of primitive craft. Our subject begins when the first Arabs erected a mast and a sail and trusted to the winds on the open sea, and to the mercy of their gods. This too was a prehistoric event. We can only guess the nature of their earliest sailing ships. It is likely that the planks of their hulls were not nailed but stitched together with twine; it is possible, but far from certain, that the sails were square and not set fore and aft as they were in historical times.[2]

In certain general respects geography favored the development of sailing from Arabian shores. A very long coastline bounds the peninsula on three sides, stretching from the Gulf of Suez round to the head of the Persian Gulf. Near these coasts lie the most fertile parts of Arabia, al-Yaman, Ḥaḍramawt, and 'Umān; communication between them by sea was no more formidable than the crossing of the deserts and mountains which separated them on land. Commerce with neighboring countries was invited, to the west by the long shores of Northeast Africa, to the northeast by those of Iran, in both cases extending parallel to and not far out from the Arabian shore, and approaching it closely at the extreme ends; so that across the enclosed waters of the Red Sea and the Persian Gulf the Arabs might be in contact with two of the most ancient centers of wealth and civilization—Egypt and Iran—not to mention Mesopotamia, which they could reach either by sea or by land. Beyond Arabia to the southwest, it was easy to cross to East Africa and coast along it in search of tropical products; to the east, the coast of Iran led on to India—and eventually the monsoon winds were to assist voyages both to Africa and to India. Most important of all, the Red Sea and the Persian Gulf, supplemented by the

[2] See Ch. III. On primitive craft: J. Hornell, *Water Transport: Origins and Early Evolution* (Cambridge, 1946); *idem*, "Sea-trade in early times," in *Antiquity*, vol. XV (1941), pp. 234-56.

Nile, the Euphrates, and the Tigris, are natural channels for through traffic between the Mediterranean basin and Eastern Asia: the Arabs were astride two of the world's great trade routes.

But the advantages of this geographical position could not be fully exploited until certain difficulties had been overcome. Arabia does not and never did produce wood suitable for building strong seagoing ships. Neither does it contain iron for nailing them, nor is it near to any iron-producing country. It has no navigable rivers and few first-class harbors. The Red Sea, stretching for some 1,200 miles, had in early times the effect of isolating rather than uniting Egypt with Southwest Arabia. The northern half of this sea in particular presented severe obstacles. It is flanked on both sides by hundreds of miles of waterless desert. Immense coral reefs skirt both coasts and in places extend far out into the sea; considerable knowledge and skill were required to avoid being wrecked on them. The coral islands favored piracy, to which the hungry nomads on both sides were all too prone, regarding it as a simple extension of their desert raids. Good harbors are almost wanting here, so that there was no safe refuge from the dangers of storms or pirates. The northward passage was especially hard to early seafarers, because northerly winds blow down this part of the sea the whole year round.[3] Rather than face the terrors of the Red Sea, the Arabs developed camel routes along the whole western side of their peninsula. Conditions in the Persian Gulf were more favorable; but here too there is a lack of fresh water on both sides, and piracy is encouraged by the number of the islands and the poverty of the coastal peoples.[4] As a result, 'Umān was in none too close contact with Mesopotamia and Iran. Outside, in the Indian Ocean, the coasts leading to India are

[3] *Encyclopaedia Britannica*, 14th ed., "Red Sea"; *The Red Sea and Gulf of Aden Pilot*, 9th ed. (London, 1944, British Admiralty), ch. 1; M. Cary, *The Geographic Background of Greek and Roman History* (Oxford, 1949), pp. 187-88.

[4] A. Wilson, *The Persian Gulf* (London, 1928), pp. 1 ff.

extremely desolate, while the monsoons could not be used to cross the open sea between Arabia and India and East Africa until ships could be constructed strong enough to endure their powerful blasts.

These natural obstacles had to be overcome by human invention, before the natural advantages could be exploited. But the isolation of Southwest Arabia and 'Umān tended to perpetuate itself, for unless there was constant communication with the ancient centers of civilization in Egypt, Western Asia, and India, the Arabs would not easily adopt the improvements in shipbuilding and navigation which those lands had to offer. Even the materials for building strong vessels had to be brought from India.[5]

THE EAST BEFORE ALEXANDER

Nothing is known of the seafaring activities of the Arabs before the Hellenic conquest of the Near East. But other nations have left records of their own voyages in Arabian waters long before that time. A brief account of these will show that the coasts of Arabia were in all historical ages in contact by sea with other countries.

Sumerian and Akkadian inscriptions of the third millennium B.C. report maritime relations between Mesopotamia and the countries of Dilmun, Magan and Melukhkha. Dilmun is probably the island of al-Baḥrayn. Magan is now generally agreed to be 'Umān. Timber and copper are said to be found there, and there is mention of "the shipwrights of Magan" in a text from Lagash of the time of Shulgi (c. 2050). Melukhkha is regularly associated with Magan in the inscriptions, but its location at this period cannot yet be more closely determined.[6]

[5] See Ch. III, pp. 89 ff.

[6] On Magan: H. Peake, "The copper mountain of Magan," in *Antiquity*, vol. II (1928), pp. 452-57; Hornell in *Antiquity*, vol. XV (1941). The timber of Magan may have been imported from India for re-export: Wilson, p. 27.

Mesopotamian boat-types, with curved hulls and lofty, almost vertical prows

On the western side of Arabia, Egyptian vessels were sailing on the Red Sea from at least the reign of Sahure (c. 2470) of the Fifth Dynasty, and under the Sixth Dynasty (c. 2341-2181) journeys were made quite frequently by land or by sea to the country of Punt, probably the Somali coast facing Arabia. At this period the Egyptian ships for this voyage were built at the head of the Gulf of Suez, so that they would pass down the whole length of the Red Sea, and return the same way against head winds—no mean achievement in such an age, on such a sea. Egyptian texts sometimes refer to them as "ships of Gebāl," which indicates either that they were of a type learned from this Phoenician city, or that they were the kind of ships used for sailing thither. The Egyptians also obtained from Gebāl the pine wood and resin required for building the ships. Again in the Middle Kingdom (c. 2000-1800) the Pharaohs sent expeditions by sea to Punt. These are reflected in the famous "story of the shipwrecked sailor," in which the sole survivor of an Egyptian ship, wrecked in the Red Sea, is cast on an island at a distance of two months' journey from Thebes. The serpent on the island claims to be the prince of Punt, and has at his command a variety of spices and African animals. In the New Kingdom, Queen Hatshepsut sent her Punt expedition probably in 1495. The reliefs and inscriptions of Dayr al-Baḥri show how five large ships were dispatched down the Red Sea, how the Egyptians were received in Punt, and how they returned. Three centuries later, Ramesses III (1198-67) sent a fleet of large ships from

---

and sterns appear in predynastic Egyptian art, on the "painted tomb" of Hieraconpolis and the Gabal al-'Arak knife-handle: H. Frankfort, "The origin of monumental architecture in Egypt," in *American Journal of Semitic Languages and Literatures*, vol. LVIII (1941), pp. 329-58; H. J. Kantor, "The final phase of predynastic culture," in *Journal of Near Eastern Studies*, vol. III (1944), pp. 110-36. Frankfort suggests that the Mesopotamian influence may have reached Hieraconpolis via Wādi Ḥammāmāt and the Red Sea from Mesopotamia, or from some Mesopotamianized country on the coasts of Iran or Arabia. But the evidence is slender and I doubt such voyages in the fourth millennium. Knowledge of Mesopotamian boat-types could as well have been acquired via Syria.

a harbor opposite Coptus to Punt, as well as a naval expedition to some copper mines in the Sinai peninsula.[7]

After the decline of Egyptian power, Phoenicians appear as the mariners of the Red Sea. They may have been so for many centuries before, but the earliest definite evidence comes from the first Book of Kings: "And King Solomon made a navy of ships in Ezion-geber, which is beside Eloth on the shore of the Red Sea, in the land of Edom; and Hiram sent in the navy his servants, shipmen that had knowledge of the sea, with the servants of Solomon. And they came to Ophir and fetched from thence gold, four hundred and twenty talents, and brought it to King Solomon."

This Ezion-geber can now be identified with confidence as the site at Tall al-Khulayfah, west of al-'Aqabah, which was excavated by an American expedition in 1938-1940. It is quite likely that Solomon himself (c. 974-932) built the town and the large copper refinery which has been unearthed there, after the subjection of the Edomites by his father David. But the passage quoted above shows clearly that Solomon's ships were manned by Phoenicians sent by King Hiram of Tyre,

[7] P. Montet, *Byblos et l'Égypte*, texte (Paris, 1928), pp. 6, 284, compares the phrase "ships of Gebāl" with the "Mari-boats," "Ur-boats" and "Akkad-boats" of the Ugarit lexicon, ed. F. Thureau-Dangin in *Syria*, vol. XII (1931), pp. 228-30. The shipwrecked sailor: A. Erman, *The Literature of the Ancient Egyptians*, Eng. tr. A. M. Blackman (London, 1927), pp. 29-35.

Hatshepsut's expedition: J. H. Breasted, *Ancient Records of Egypt* (Chicago, 1906-7, vol. II, secs. 246-87; E. Naville, *The Temple of Deir al Bahari*, pt. III (London, 1898), pls. 69-85. R. P. Dougherty, *The Sealand of Ancient Arabia* (New Haven, 1932), pp. 170-72, suggests that the "God's Land" of the Dayr al-Baḥri texts may be in South Arabia; perhaps Punt too includes South Arabia. Breasted suggests (sec. 248) that the ships may have sailed from Thebes down the Nile, through the ancient Nile-Suez canal, then southwards on the Red Sea. But see G. Posener, "Le canal du Nil à la mer rouge avant les Ptolemées," in *Chronique d'Égypte*, vol. XXVI (July 1938), pp. 259-73: there is no solid evidence that the canal existed before the first millennium, and Dayr al-Baḥri does not prove that the ships actually sailed from Thebes. Besides, Breasted's route would involve a detour of some 800 miles. It is more probable that the expedition went overland from Thebes down the Wādi Ḥammāmāt, and that the fleet sailed from a port in the region of al-Quṣayr, as did the fleet of Ramesses III. See also P. E. Newberry, "Notes on Sea-Going Ships" in *Journal of Egyptian Archaeology*, vol. XXVIII (1942), pp. 64-66.

and succeeding verses also speak of a separate fleet of Hiram sailing with that of his ally. These ships must have been built at Ezion-geber, and at Tall al-Khulayfah there were actually found large nails of iron and of copper alloyed with iron, fragments of thick ropes, lumps of pitch for caulking, and resin for coating. Wood for planks could be cut from the oak forests then existing in Edom. The "Ophir" to which these ships sailed may well have been in India, for the voyage was made only once every three years. The merchandise brought from Ophir—gold, silver, jewels, *almug* wood, ivory, apes and peacocks—smacks of India, etymologically and economically. The same passage in I Kings describes the visit of the Queen of Sheba to Solomon, but it is noticeable that she came by camel caravan, not by sea. The inland route from al-Yaman to Syria, running through the desert parallel to the Red Sea, was evidently in use among the Sabaeans then, as among the Meccans in Muḥammad's day.[8] After the division of Solomon's kingdom the sea trade ceased for some time. King Jehoshaphat of Judah (c. 873-849) attempted to revive it, building ships once more in order to bring gold from Ophir; but they were "broken" at Ezion-geber, presumably wrecked by the strong winds of the Gulf of 'Aqabah.[9]

[8] I Kings 9: 26-28 (quoted) and ff., Authorized Version. On Ezion-geber: N. Glueck, arts. in *Bulletin of the American Schools of Oriental Research*, Nos. 71 and 72 (October and December 1938), No. 76 (October 1939), No. 80 (October 1940); and in *Annual Report of the Smithsonian Institution* (1941), pp. 453-78. On Ophir: J. Montgomery, *Arabia and the Bible* (Philadelphia, 1934), pp. 176 ff.; B. Moritz, *Arabien* (Hanover, 1923), pp. 63 ff. J. Hornell, "Naval Activity in the Days of Solomon," in *Antiquity*, vol. XXI (June 1947), pp. 66-73.

[9] II Kings 22: 47-49; II Chronicles 20: 35-37. Ezekiel 27: 23 shows Tyrian traffic early in the sixth century with Sheba, Canneh and Eden, but probably by caravan. I regard as legendary the story of a Phoenician voyage round Africa, c. 600 B.C. (Herodotus, bk. IV, ch. 42). Such a voyage, of some 16,000 miles, would have been far longer than anything else done by man before the fifteenth century A.D.; and if it had been made it would not have left the ancients ignorant of the shape of Africa. The appearance of the sun to starboard on the southern coast of Africa was an easy guess to Herodotus' Egyptian informants, who must have heard of the position of the summer sun in the Upper Nile valley, south of the Tropic of Cancer. See J. O. Thomson, *A History of Ancient Geography* (Cambridge, 1948), pp. 71-72.

On the Persian Gulf, the ancient kingdom of "Sealand," which has been located with near certainty in Northeastern Arabia, held the coast from near the Euphrates mouth to Dilmun. This kingdom in the first millennium seems to have comprised Chaldaeans and Arabs. Early in the seventh century the king of Sealand, after an unsuccessful revolt against his Assyrian overlord Sennacherib (705-681), escaped with some followers across the Persian Gulf and took refuge in Elam. This shows a certain minimum of nautical activity, but more interesting is the reaction of Sennacherib. He brought Phoenicians to Nineveh to build him powerful ships, then manned the ships with Tyrian, Sidonian, and Cyprian sailors and had them sent down the inland waterways, and in places hauled overland, till they came to the mouth of the Euphrates. Warriors were there embarked, and the expedition sailed to the mouth of the river Ulai (the Kārūn): this river now enters the Shaṭṭ al-'Arab, but then flowed directly into the Persian Gulf, which extended further to the north and west than it does today. Here the troops made a landing against the Sealanders drawn up on the shore, and defeated them. The account of this campaign, narrated in a vivid Assyrian inscription, demonstrates either that the Persian Gulf lacked the craftsmen to build sound vessels even for such a short voyage, or that Sennacherib expected naval opposition and so required a superior navy. The timber for the ships, too, may have been fetched from Lebanon to Nineveh by the Phoenicians, since Mesopotamia probably produced little suitable timber.[10]

There is no substantial evidence for maritime activity under the Neo-Babylonian dynasty (626-539).[11] But their suc-

[10] S. Luckenbill, *Ancient Records of Assyria and Babylonia* (Chicago, 1927), vol. II, secs. 318-21. On "Sealand": Dougherty, *passim*; the name may be due to proximity to the sea, or to swamps near the Euphrates, or the sea-like appearance of the desert. On changes in the coastline and river beds: Wilson, p. 42.

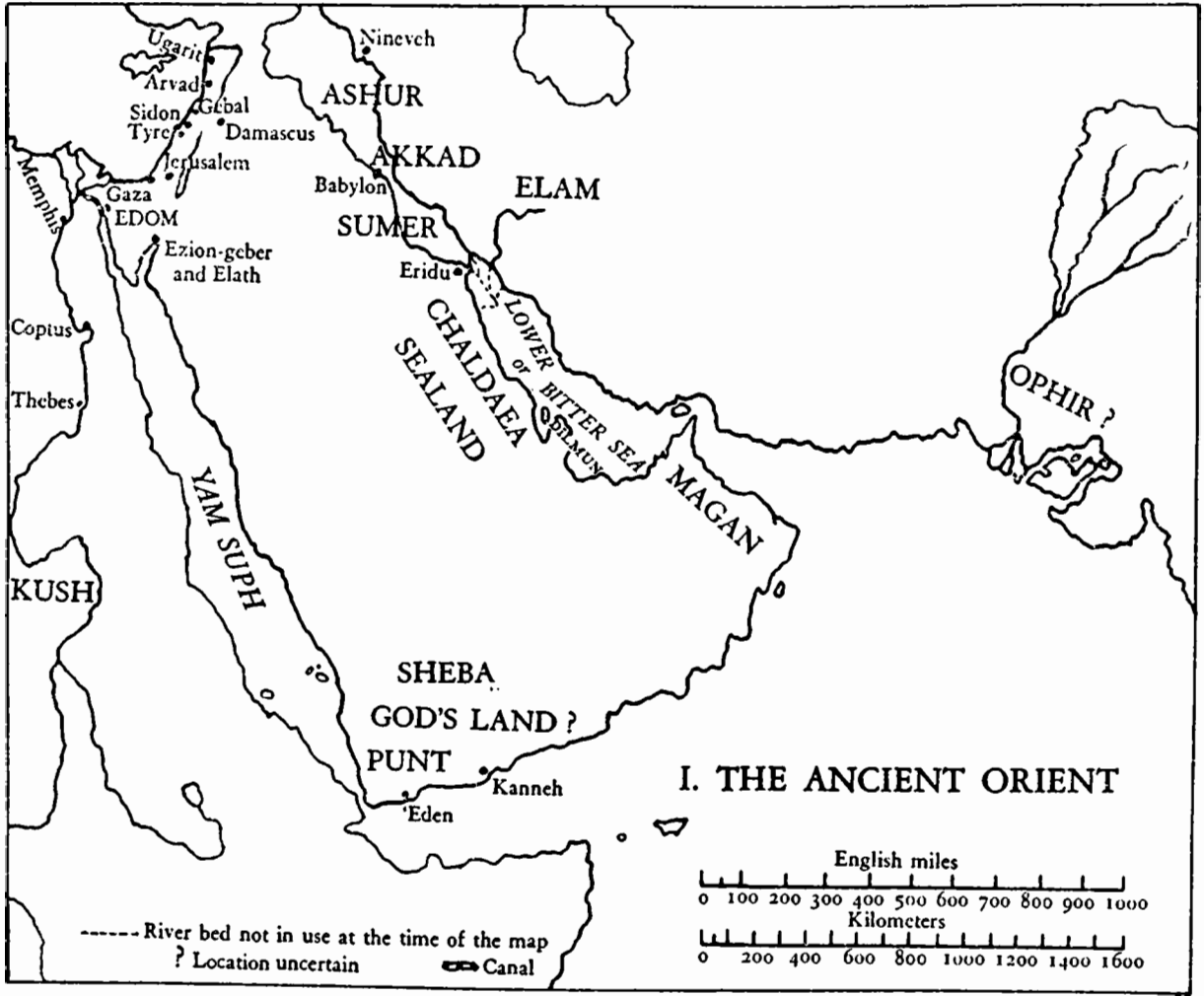
[11] Eusebius, *Praeparatio Evangelica*, bk. IX, ch. 41, preserves a tradition about the public works of Nebuchadnezzar II (605-562) at Teredon (probably the former Eridu) at the Euphrates mouth; Isaiah 43: 14 speaks of Chaldaean ships,

cessors, the Persians, opened up fresh possibilities of economic development by uniting the whole of Western Asia and Egypt in an enduring empire. Darius the Great (521-485) appreciated the value of linking Persia with India and Egypt by sea as well as by land, and for this purpose organized some notable maritime operations. He sent a fleet down the Indus and thence round Arabia to Egypt. One of the captains of this expedition is named by Herodotus, "Scylax of Caryanda." Darius also had a ship canal dug, or re-dug, from the old Pelusiac arm of the Nile near Zaqāzīq, down the Wādi Tūmīlāt, and through the lakes to Suez; he then sent a fleet from the Nile down this canal and the Red Sea to Persia. Ships may even have come through from the Mediterranean, for during the revolt of Egypt in 460-454 the Athenian navy sailed up the river as far south as Memphis.[12]

Such are the main facts known about Arabian waters before the Greek expansion. Passing them in review, we may notice the prominence of the Phoenicians in the seas of the East. In transferring their energies to that quarter from the Mediterranean, they probably found little difficulty in learning the dialects and understanding the mentality and customs of their Semitic cousins in Arabia. About the Arab seamen of the ancient East we have met no evidence. But in view of the flourishing condition of the Minaeans and Sabaeans in the first millennium, and in the light of what can be learned of their nautical activity in Hellenistic times, it is a sound conjecture that Arabs were playing some part in the seafaring life of their times for many centuries before Alexander.

according to one interpretation; Aeschylus, *Persians*, line 54 has a vague reference to Babylonian ships. Wilson, pp. 32-34.

[12] On Scylax: Herodotus, *History*, bk. IV, ch. 44; E. Herzfeld, *Zoroaster and his World* (Princeton, 1947), vol. II, pp. 652-69. Canal inscription in Posener, *La première domination perse en Égypte* (Cairo, 1936), pp. 48-87. Thucydides, *Peloponnesian War*, bk. I, chs. 104, 109. Darius's inscription contains a reference to an earlier canal, which must be that of Necho (late seventh century) mentioned by Herodotus, bk. II, ch. 158, and bk. IV, ch. 42, and other Greek writers. Indian merchant ships carried a peacock to Babylon, perhaps as early as 400: *The Jātaka*, Eng. tr. E. B. Cowell and others (Cambridge, 1897 sqq.), vol. III, pp. 83-84.


Ugarit
Arvad
Sidon
Tyre
Gebal
Damascus
Jerusalem
Gaza
EDOM
Memphis
Ezion-geber
and Elath
Nineveh
ASHUR
AKKAD
Babylon
SUMER
ELAM
Eridu
CHALDAEA
SEALAND
LOWER SEA or BITTER SEA
DILMUN
MAGAN
OPHIR ?
Coptus
Thebes
YAM SUPH
KUSH
SHEBA
GOD'S LAND ?
PUNT
Kanneh
Eden
I. THE ANCIENT ORIENT
English miles
0 100 200 300 400 500 600 700 800 900 1000
Kilometers
0 200 400 600 800 1000 1200 1400 1600
------ River bed not in use at the time of the map
? Location uncertain
Canal

THE PERSIAN GULF IN HELLENISTIC AND ROMAN TIMES

The career of Alexander the Great (d. 323) marks an epoch in the history of the Near East, and would have had even greater effects had he lived longer. He might have established another permanently united empire in the lands where the Persian Empire had been. Without any doubt he would have accomplished that exploration of Arabian coasts which he was planning, and this would have shed as much light on those coasts as Nearchus's expedition did on the shores of Iran. Conquest might have followed; Greek commerce with India would probably have begun two centuries earlier than it did. As it was, the effects of the Macedonian conquests were great enough. The shores of the Eastern Mediterranean had already been united by the Persians with those of the two gulfs of the Indian Ocean; but Greek economic enterprise was to exploit more fully the advantages of such a union, and Greek curiosity was to dispel the darkness in which Arabia had so long been enwrapped.

In his last year Alexander had been busy hiring Phoenicians to navigate the Persian Gulf and colonize its shores; transporting many vessels in parts from Phoenicia to Mesopotamia, and constructing a few from the cypress trees near Babylon; improving the navigability of the Euphrates and the capacity of the inland port of Babylon; and sending out three ships for preliminary exploration down the Gulf. One of these ships called at al-Baḥrayn and observed the pearl fisheries there. But none advanced beyond Cape Muṣandam, and these voyages proved fruitless.[13] After Alexander's death his preparations were not followed up, and the Greeks of the Seleucid Empire never showed much activity on the Persian Gulf. In the third century the most active merchants for the

[13] Arrian, *Anabasis*, bk. VII, chs. 19-20, derived from Aristobulus, a contemporary of Alexander.

whole of this area were the people of Gerrha, a Chaldaean town on the coast of al-Ḥasa which may well by this time have included many Arabs. The Gerrhaeans conducted a caravan trade with the incense land of South Arabia, and probably both sea and land trade with Seleucia on the Tigris, the successor of Babylon as the commercial center of Mesopotamia. Seagoing ships could sail right up to Seleucia, which was thus the terminus for the Gulf traffic.[14] There were also markets at Teredon on the mouth of the Euphrates and Charax at the junction of the Tigris with the Eulaeus (Kārūn). Antiochus III in about 205 made an expedition against Gerrha, but was bought off by a rich tribute of silver, frankincense and myrrh.

"The Gerrhaeans begged the king not to destroy what had been given to them by the gods, eternal peace and freedom."[15] Apart from this half-hearted effort, there is little evidence in this direction. This is surprising; one would have expected the Seleucid monarchs to develop a profitable traffic between India and the Mediterranean, passing along the sea route of Nearchus and then across their empire in Mesopotamia and Northern Syria. As it was, their trade with India seems to have passed mainly across Iran; at least their elephants were brought that way. But it is possible that there was a sea trade which is simply not recorded in our fragmentary sources for Seleucid history.

When the Parthians took Babylon and Seleucia between 140 and 130, the chance was gone. The Parthian emperors could draw a fine revenue from the land routes across their realm to India and China, and gave no facilities to Western enterprise, Greek or Roman, to establish a rival sea route. Throughout the period of the Roman Empire, Persian Gulf

[14] Agatharchides, *On the Erythraean Sea*, ch. 102, in K. Müller, *Geographi Graeci Minores* (Paris, 1882), vol. 1 (see below p. 21 for comments on this passage); Strabo, *Geography*, bk. XVI, ch. 1, sec. 9 and ch. 3, sec. 2, derived from Aristobulus and Eratosthenes, the Alexandrian geographer (276-196).

[15] Polybius, *Histories*, bk. XIII, ch. 9 (quoted).

trade remained in the hands of small intermediary cities in which Arabs were prominent: Charax and its neighbor Apologus, in close contact with Palmyra in the Syrian desert. Only once did the Romans attempt to break down this system, when Trajan conquered Mesopotamia and received the surrender of Charax (A.D. 116); but the Parthians quickly recovered the lost territory. It was after this that Palmyra enjoyed her greatest prosperity; Rome seems to have agreed to leave her semi-independent so that her merchants could trade in both the great empires.

Charax was originally a Greek city, founded by Alexander and restored by one of the Seleucid monarchs; at some later period it was re-founded by a certain Spasinus, king of the neighboring Arabs, who named it after himself "Charax Spasinou." Pliny says that in his time (before A.D. 77) Charax was a town of Arabia marking the frontier of Parthia. When Trajan came upon it, it was in the small domain of Athambelus, clearly a Semitic prince. Apologus is only mentioned in the *Periplus of the Erythraean Sea*, a work of about A.D. 50-60 to be described shortly. The author calls it a market town "of Persia," i.e. Parthia, and says it exported to al-Yaman much pearls, purples, wine, dates, gold, and slaves. The population of these twin ports was probably a mixture of Arabs, Chaldaeans, and Persians. From one or both of them voyages were made round Arabia. This is attested by the sober reports of Chinese travelers to Parthia. The annals of the earlier Han period (206 B.C. to A.D. 25) say that from T'iao-chih (identified as Chaldaea) you may sail west for over a hundred days until you arrive at the land of the setting sun. Since the same passage says that T'iao-chih is a dependent state of Parthia, this must refer to some time after 140 B.C. More interesting is a passage from the later Han annals which refers to A.D. 97. In this year ". . . the general Pan-Ch'ao sent Kan-ying [from Central Asia] as an ambassador to Ta-ts' in [Syria], who arrived in T'iao-chih, on the coast of the great sea. When about

to take his passage across the sea, the sailors of the western frontier of Parthia told Kan-ying: 'The sea is vast and great; with favourable winds it is possible to cross within three months; but if you meet slow winds, it may also take you two years. It is for this reason that those who go to sea take on board a supply of three years' provisions. There is something in the sea which is apt to make a man homesick, and several have thus [sic] lost their lives.' When Kan-ying heard this, he stopped." By comparison with Pliny, it appears probable that Charax is the port of embarkation here referred to. The same passage declares that Ta-ts'in is also called Li-chien; as this has been identified with Petra, the city and land of the Nabataean Arabs, we may conjecture that the terminus of the sea voyage was Leuce Come or Aela in Northwest Arabia. Without doubt the statement that the voyage might take two years is an exaggeration.

Both Charax and Apologus also traded with India. The same products which were exported from Apologus to al-Yaman were also exported to Barygaza on the Gulf of Cambay, and "large vessels" returned from there laden with copper, ebony and timber of various kinds. When Trajan stood on the shore at Charax, envying Alexander, he saw a boat sailing to India, and regretted that he was too old to make the crossing.[16]

The writer of the *Periplus* also deals with a remote port called Omana, which he puts on the Persian coast in Carmania, six days' sail east of the Strait of Hurmuz. Pliny the Elder expressly denies that it is in Carmania, and places it on

[16] Pliny, *Natural History*, bk. VI, chs. 31-32; Dio Cassius, *Roman History*, bk. LXVIII, chs. 28-29. *The Periplus of the Erythraean Sea*, chs. 35-36, in *Geog. Gr. Min.*, vol. I, and ed. H. Frisk (Goteborg, 1927); Eng. tr. and notes by W. H. Schoff (New York, 1912). *Ch'ien-han-shu*, ch. 96a; *Hou-han-shu*, ch. 88: Eng. tr. in F. Hirth, *China and the Roman Orient* (Leipzig, 1885), pp. 145, 39. Isidore of Charax, *Parthian Stations*, Eng. tr. W. H. Schoff (Philadelphia, 1914). *C.A.H.*, vol. XI (Cambridge, 1936), pp. 120-24, M. Rostovtzeff. Rostovtzeff thinks the difficulties of the voyage round Arabia were purposely exaggerated by the Parthians, who were interested in maintaining the use of the overland route. But the sailors who informed Kan-ying were very likely not Parthians.

the Arabian coast west of the Strait of Hurmuz. But neither of these authors had reliable knowledge of these regions, and it seems to me most likely that Omana was a port of 'Umān, whether at Suḥār or Masqaṭ or elsewhere; it may have been under Parthian sovereignty as the *Periplus* seems to say. Certainly the name suggests 'Umān. Moreover the exports mentioned by the *Periplus* point to Arabia rather than Iran: they are the same as those of Apologus, with the addition of sewn boats called *madarata*; this word is Arabic in form and the manner of construction is typically Arabian. These boats were built for export to South Arabia; the other exports went thither and to Barygaza, as from Apologus. The imports were the same as those of Apologus, except that Cane (Ezekiel's Canneh) sent frankincense to Omana. Pliny also mentions Gerrha as a large town, and a town of Acila near Rās Muṣandam as a port of embarkation for India.[17]

Thus there existed at this period a regular commerce by sea from the Persian Gulf to the mouth of the River Nerbudda in one direction and Southwest Arabia in another; and in this commerce the Arabs of the Gulf were probably playing a leading part. But the great centuries of the Persian Gulf had not yet arrived. These were the days of the Red Sea.

THE RED SEA IN HELLENISTIC AND ROMAN TIMES

Here at length the sources begin to be less meager, though

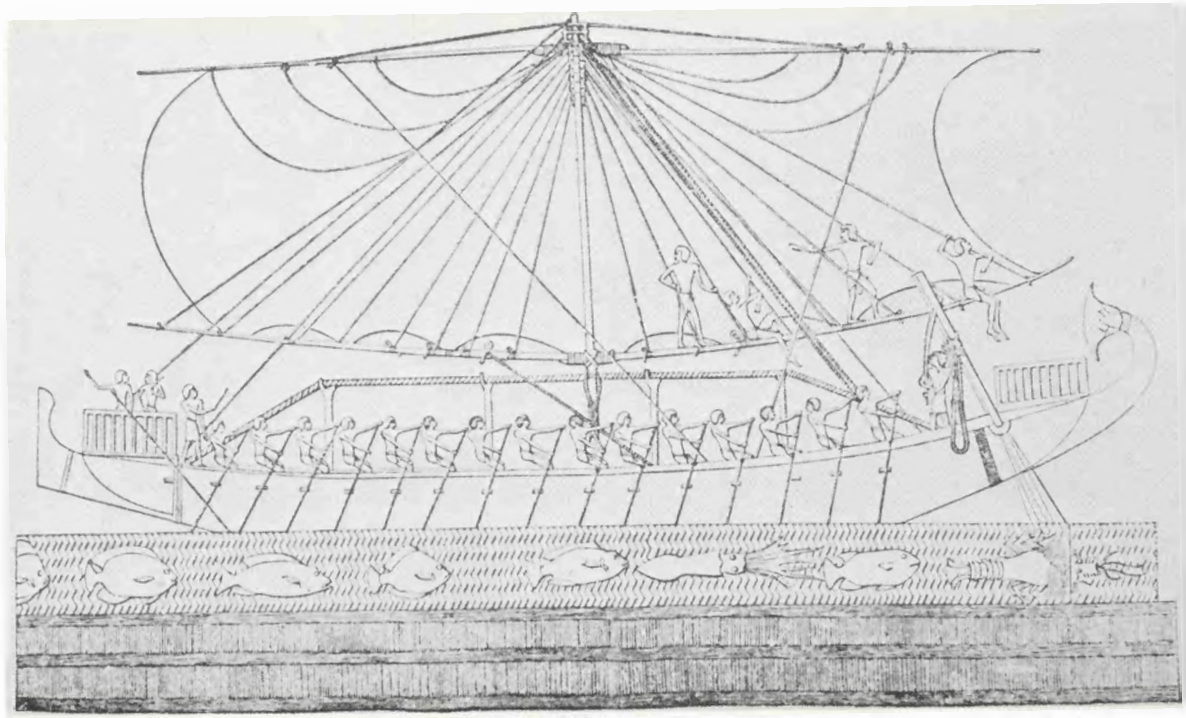
[17] *Periplus*, ch. 36; Pliny, *Natural History*, bk. VI, ch. 32. Pliny barely names a number of towns on the coast, and records a sea battle off Cape Muṣandam between a Seleucid governor and some Persians.

On the location of Omana: Schoff; E. Glaser, *Skizze der Geschichte und Geographie Arabiens* (Berlin, 1890), pp. 186 ff. It is certain that the author of the *Periplus* regards Omana as in Carmania. He has just described the coast of South Arabia from west to east, and followed it round to the mouth of the Persian Gulf; after a brief mention of Apologus inside the Gulf, he continues: "As you sail *past* (*parapleusanti*) this mouth of the Gulf, after a run of six days there is another market-town of Persia, called Omana." Thus he is continuing the coasting voyage round the Gulf of 'Umān, regarding the sentence on Apologus as a digression. After Omana he continues with the coast of Eastern Iran and Western India (chs. 37-38).

still not generous. There is a precious little treatise on the Red Sea written by the Alexandrian savant Agatharchides in about 110 B.C., the substance of which has survived in two versions in the encyclopedic works of Diodorus Siculus and Photius. Agatharchides tells us that his account of the Red Sea is based on oral reports of eyewitnesses and written reports in the royal archives at Alexandria, to which he had access: among the latter he made use of the report of a certain Ariston who explored the west coast of Arabia for one of the Ptolemies, probably Ptolemy II Philadelphus (285-246). Thus we cannot always be sure whether a particular passage in his work refers to the third or the second century; but at least he makes it fairly clear that he is describing a time before the new developments in the sea trade with India which took place after 120 B.C.[18] For the first century B.C. our information is once more scanty. During the more settled age of Augustus, Strabo commenced his vast *Geography*, which he completed under Tiberius, not earlier than A.D. 23. From the time of Claudius or Nero, perhaps around A.D. 50-60, we have the valuable *Periplus of the Erythraean Sea.* The author was a Greek merchant of Egypt, whose name is unknown to us; he prepared this handbook of the western coasts of the Indian Ocean for the use of merchants and pilots. The detailed account of the sailing conditions, ports and products of the Red Sea coasts, Somaliland, and Western India show that the writer had personal experience of those regions. For East Africa beyond Cape Guardafui, Arabia east of Cane, and India south of the Bombay area it is apparent that he relies on the statements of other merchants with whom he was in contact; but even this is more valuable to us than the legends or out-of-date facts so often furnished by the more learned writers of antiquity when they treat of

[18] Agatharchides, chs. 79, 85, 110; Müllers' introd. to *Geog. Gr. Min.*, vol. I, pp. liv ff. W. W. Tarn, "Ptolemy II and Arabia," pp. 13-14, in *Journal of Egyptian Archaeology*, vol. XV (1929).

1. A Modern Arab Sailing Ship of the Indian Ocean. A deep sea *būm*, 1939, in the trade between al-Kuwayt and Zanzibar. This vessel differs in some respects from a mediaeval Arab sailing ship: (1) its planks are nailed, not sewn, (2) it has a stern rudder, not side rudders, (3) its rigging is somewhat modernized. But it probably preserves the mediaeval type (a) in being double-ended, i.e. terminating in a sharp point at prow and stern alike, (b) in its two masts, (c) in its lofty lateen sails with a luff in their fore parts. (*Photograph by A. Villiers.*)



2. An Ancient Egyptian Ship. One of Queen Hatshepsut's fleet which went to Punt c. 1495 B.C.; a drawing based on reliefs at Dayr al-Bahri. The most striking feature is the broad sail. Proportions cannot be relied upon, but we notice that the yards are each formed of two spars lashed together; single spars of sufficient length could not be found. The sail is not really set fore-and-aft; this apparent position was forced on the artist by his ignorance of perspective. The rope truss below the sail was meant to reinforce the hull and prevent hogging. Oars and sails are being used at the same time. Rigging is plentiful. There are two steersmen, each controlling a side-rudder.

From G. S. L. Clowes, *Sailing Ships* (London, 1932), p. 23: original drawing in E. Naville, *The Temple of Deir el Bahari*, Part iii (London, 1898), Plate 73.

remote countries. The *Periplus* is the most important ancient document on our subject.[19] Finally the *Natural History* of Pliny the Elder, published in A.D. 77, provides some useful data on the sea trade between the Roman Empire and India. From Agatharchides, Strabo, the *Periplus*, and Pliny, as well as occasional statements in other writings, and a few inscriptions, we are enabled to form a tolerably clear view of the Red Sea and the Arabian Sea in Hellenistic and early Roman times.

From Egypt as well as Mesopotamia Alexander had dispatched an expedition to sail round Arabia: this too turned back, after reaching the straits of Bāb al-Mandab. But failure to complete this attempt was quite unimportant in comparison with Alexander's great act of creation in Egypt, the founding of Alexandria. The economic position of this mighty Greek city near the crossroads of Asia and Africa, the Mediterranean Sea and the Indian Ocean, was superb. By the statesmanship of the early Ptolemaic kings and the energy of Greek merchants, Alexandria became the center for commerce from all those quarters, and stimulated this commerce to a size unknown before.[20]

Sooner or later, Alexandria was sure to affect powerfully the economy of South Arabia and India. But this did not happen at first. When the Hellenistic world emerged from its initial confusion, Ptolemy II devoted attention to the African shore of the Red Sea: but his main object was to acquire elephants, the tanks of the ancient world, to oppose the Indian elephants of the Seleucids. For this purpose he

[19] E. H. Bunbury, *A History of Ancient Geography* (London, 1879, vol. II, pp. 443 ff. On the date of the *Periplus*: M. P. Charlesworth in *Classical Quarterly*, vol. XXII (1928), p. 92; *C.A.H.*, vol. X (Cambridge, 1934), p. 882, J. G. C. Anderson; J. A. B. Palmer in *Class. Quart.*, vol. XLI (1947), pp. 136-41.

[20] Arrian, *Indica*, ch. 43, sec. 7; Eratosthenes in Strabo, bk. XVI, ch. 4, sec. 4; Theophrastus, *History of Plants*, bk. IX, ch. 4. On Alexandria: A. Kammerer, *La mer rouge, l'Abyssinie et l'Arabie*, pt. I, vol. I (Cairo 1929), pp. 5 ff. Ptolemaic inscription of Adulis, recorded by Cosmas Indicopleustes, *Christian Topography*, bk. II, chs. 141-42.

established colonies on the coast of Ethiopia, at which the beasts were embarked in stout transports and shipped to Berenice, an open roadstead east of Syene; from Berenice they were marched across the desert to Coptus, along a route which he furnished with garrisons and provisions of food and water. This route he used in order to avoid the foul winds and pirates of the Red Sea further north. But the Gulf of Suez was not wholly neglected, for Ptolemy II once more reopened the old canal to the Nile (c. 275). Further, there are reasons for believing that he showed some interest in the Arabian west coast in its whole extent. He was probably the monarch at whose orders Ariston sailed from the Gulf of Suez to Bāb al-Mandab, exploring the Arabian coast on the voyage; perhaps it was he under whose patronage the small Milesian colony of Ampelone was founded on the northern part of that coast. And if these enterprises fall under his reign, it becomes likely that he was one of those "kings of Alexandria" who according to Agatharchides made the Gulf of 'Aqabah navigable to merchants. The aim of this, combined with the exploration of Ariston, may have been to reopen the route of Solomon and Hiram, since Palestine and Phoenicia were now Ptolemaic. This attempt provoked a violent reaction from the Nabataeans, who were in control of the northern end of the caravan route from South Arabia and earned their livelihood from it.

"Of old," writes Agatharchides, "they earned a just livelihood, being satisfied with nourishment from their herds; but later, when the kings from Alexandria made the gulf navigable to merchants, they attacked shipwrecked persons, and building pirate ships plundered seafarers, rivalling the Pontic Tauri in ferocity and lawlessness. But after that they were caught on the open sea by quadriremes and properly punished."[21]

[21] Agatharchides, chs. 1, 83, 85, 88 (quoted); Strabo, bk. XVII, ch. 1, secs. 44-45. W. W. Tarn, *loc. cit.* in *J. Eg. Arch.*, vol. XV (1929). M. Rostovtzeff, *The*

In spite of Ptolemy's activities, however, and though some Greek merchant ships may have reached South Arabia, it is probable that both the land and the sea trade between it and Egypt were largely in the hands of Arabs in the third century B.C. For this there are two pieces of positive evidence. One is a general statement of Agatharchides: "For no nation seems to be wealthier than the Sabaeans and Gerrhaeans, who are the agents for everything that falls under the name of transport from Asia and Europe. It is they who have made Ptolemaic Syria rich in gold, and who have provided profitable trade and thousands of other things to Phoenician enterprise."

It is plain that this passage refers to the third century, before the Ptolemies were driven from Syria and Palestine. Although the author seems to be thinking largely of the caravan traffic which had its terminus in the Phoenician ports, the phrase "everything that falls under the name of transport" (*pān to pipton eis diaphorās logon*) must include shipping; and I understand the "agency" (*ekτetamieumenōn*) of the Sabaeans and Gerrhaeans to mean active participation, not mere regulation. The other piece of evidence is a funeral inscription from al-Gīzah, in South Arabic script and Minaean language, dated in the twenty-second year of "Ptolemy, son of Ptolemy"—i.e. 263 B.C. if this refers to Ptolemy II, as is probable. This reveals that a Minaean called Zayd-Il son of Zayd, a priest in an Egyptian temple, used to import myrrh and calamus from his country for the use of the temple, and export in return *in his own merchant ship* fine garments of the Egyptian linen known as *byssos*. It is natural to suppose that Zayd-Il had been appointed an Egyptian priest expressly in order to import the spices needed for the service of the gods.[22]

Social and Economic History of the Hellenistic World (Oxford, 1941), vol. I, pp. 383 ff.

[22] Agatharchides, ch. 102; N. Rhodokanakis, "Die Sarkophaginschrift von

If, then, Minaeans and Sabaeans were certainly sailing to Egypt in the third century B.C., it is permissible to ask, for how many centuries before had this been the case? For thousands of years in succession Arabian spices had been used in Egypt for embalming and sacrifices. In the intervals between the few well-known Egyptian voyages to the south, were those products being brought in Arab hulls? In the light of our early Hellenistic evidence, this appears possible: but nothing can be proved, because there was always the alternative route by camel over the deserts of Arabia and Sinai.

Agatharchides describes in memorable sentences the coasting voyages past South Arabia, possibly using his imagination to supply some gaps in his knowledge. "For a heavenly and indescribable fragrance seems to strike and stir the senses of everyone. Even far out from the land as you sail past you do not miss a share in this enjoyment. For in the spring, whenever a wind arises from the land it happens that the fragrant odours blowing from the myrrh bushes and others of the kind reach the neighbouring parts of the sea." Then the venerable geographer goes on to "the Happy Isles," the name of which is evidently the Greek translation of the Sanskrit *Dvipa Sukhatara*, i.e. Socotra. To these islands he asserts that merchants come from all directions, including Patala at the mouth of the Indus, Persis, and Carmania. Already, therefore, Socotra had acquired its cosmopolitan character, with Indians, Arabs, Greeks, and probably Persians and Africans mingling in its markets. According to a tradition current in the sixth century A.D., the Ptolemies sent out

---

Gizen," in *Zeitschrift für Semitistik*, vol. II (1924), pp. 113-14. W. Schwarz, "Die Inschriften des Wustentempels von Redesiye," in *Jahrbuch für Klassischen Philologie*, vol. CLIII (1896), p. 157, note 9: a Greek offers thanks for safe return from the land of the Sabaeans; but there is no indication whether he travelled in a Greek or a Sabaean ship. *Periplus*, ch. 26, rather indicates that Greek ships used to sail to South Arabia; Ptolemy's activities in the Gulf of 'Aqabah and elsewhere suggest the same thing. On the Sabaeans: Pauly-Wissowa, *Real-Encyclopädie*, "Saba."

Greek "colonists" to the island, but it is more likely that these were traders settling there on their own initiative.[23]

There is indeed every reason to believe that the towns of South Arabia and Socotra were at this period the *entrepôts* of all intercourse between Egypt on one side and India on the other. Apart from the statements of Agatharchides mentioned above, concerning Sabaean middlemen and Socotra, the *Periplus* says of Arabia Eudaemon (Aden): "It was called 'Eudaemon,' and it was formerly a city, when the voyage was not yet made from India to Egypt, and when they did not dare to sail from Egypt to the ports across this ocean, but all came together at this place; in those days it used to receive the cargoes from both countries, just as Alexandria now receives the things brought both from abroad and from Egypt." The ambassadors whom Ptolemy II exchanged with the Maurya emperors Chandragupta and Asoka, and the Indian women, oxen and marbles which he displayed in his triumphal procession in 271/70 B.C., may all have been transshipped in this way at Sabaean ports.[24]

For the second century we have evidence of Arab traders on the Aegean island of Delos, which was then the center of Oriental trade with the Mediterranean world; in particular, there are Minaean and Sabaean inscriptions dedicated to South Arabian gods.[25] But toward the end of this century there occurred two important developments in Ptolemaic

[23] Agatharchides, chs. 97 (quoted), 103. Cf. Milton, *Paradise Lost*, bk. IV, lines 162-63: "Sabean Odours from the spicie shoare Of Arabie the Blest." Milton may have read Agatharchides' description in the version of Diodorus, bk. III, ch. 46. cf. *Periplus*, ch. 30. Cosmas, bk. III, chs. 178-79.

[24] *Periplus*, ch. 26 (quoted); cf. ch. 37. W. Otto and H. Bengtson, *Zur Geschichte des Niederganges des Ptolemäerreiches* (Munich, 1938), pp. 194 ff.; references for Ptolemy II and India are given there; also for a certain *Sophōn Indos* in Rudaysīyah (in Upper Egypt) in the third and second centuries B.C. No Ptolemaic coins of these centuries have yet been found in India (see Otto and Bengtson).

Periplus, ch. 26, points to Indian shipping to Arabia Eudaemon in former times.

[25] Rostovtzeff, *Hellenistic World*, vol. II, p. 702 and note 124.

intercourse with India, which may have dismayed the South Arabians at first. (i) Ptolemy VII (Euergetes II, 146-116) seems to have been interested in developing Red Sea commerce; an inscription of 130 mentions an official "in charge of sailings" and of the desert route to Coptus. Then, between 120 and 110 B.C., we hear of direct expeditions by sea from Egypt to India, led by a certain Eudoxus of Cyzicus. From this time onward it appears that there were regular sailings to India and that the kings of Egypt exercised a certain supervision over them: for between 110 and 51 B.C. we have the evidence of four dedicatory inscriptions found in Egypt, mentioning Ptolemaic officers "in charge of the Red and Indian Seas."[26] (ii) Either on the expeditions of Eudoxus or not many years afterwards, a Greek called Hippalus learned the art of direct ocean sailing from Arabia to India, with the southwest monsoon which blows in summer. At first the new knowledge was used only to cut across the northernmost reaches of the Arabian Sea, between the Mahrah coast and the Indus delta; but the captains grew more daring by degrees, until they were sailing straight from the mouth of the Red Sea to Malabar. These events are not recorded in any source earlier than the *Periplus* and Pliny, and the discovery of Hippalus itself used to be dated to the reign of Claudius (A.D. 41-54); but recent investigation tends to place it in the later Ptolemaic period. It is possible that Hippalus was the pilot who accompanied Eudoxus; in that case, since the *Periplus* indicates that Hippalus was not the first to sail to India, there must have been a period before Eudoxus when Greeks were making coasting voyages. Or it may be that Eudoxus was the first Greek to make even a coasting voyage, and Hippalus followed later; but in any case he can hardly be put later than 90 B.C., to allow time for the subse-

[26] Posidonius in Strabo, bk. II, ch. 3, sec. 4. Full references for the inscriptions are given in Otto and Bengtson, *loc. cit.*, and Rostovtzeff, *Hellenistic World*, vol. II, pp. 923-29 and notes 203-7. An Indian ship wrecked on the coast of Egypt: Strabo, *loc. cit.*

quent stages in the development of the route mentioned by Pliny.

Hippalus's discovery was an event of far-reaching importance; at the same time it presents problems to the historian. For both these reasons we may inspect it in rather more detail. What exactly did Hippalus discover? The *Periplus* gives the following account: "This whole voyage as above described, from Cana and Eudaemon Arabia, they used to make in small vessels, sailing close around the shores of the gulfs; and Hippalus was the pilot who by observing the location of the ports and the conditions of the sea, first discovered how to lay his course straight across the ocean. For at the same time when with us the Etesian winds are blowing, on the shores of India the wind sets in from the ocean, and this southwest wind is called Hippalus. From that day to the present ships start, some direct from Cana, and some from the Cape of Spices; and those bound for Damirica throw the ship's head considerably off the wind; while those bound for Barygaza and Scythia keep along shore not more than three days and for the rest of the time hold the same course straight out to sea from that region, with a favourable wind, quite away from the land, and so sail outside past the aforesaid gulfs."

Let it be clear, first of all, that Hippalus did not discover the *existence* of the monsoons. The existence and seasons of the monsoons had been common knowledge to the Greeks since Nearchus's return from the Indus (326-325); and even if they had not been, the first Greeks to spend a year outside the Red Sea would have learned about them. The Arabs could no more keep them a "trade secret" than they could keep the sun or the moon. Next we must notice that neither the *Periplus* nor Pliny attributes to Hippalus any discovery about the return voyage from India. The return would obviously be made at all periods, both by Arabs and Greeks, in winter with the northeast monsoon, which provides the fairest

possible sailing conditions for a westward voyage. What Hippalus discovered, as the *Periplus* plainly states, was *how to use* the monsoon on the *outward* voyage to India. Further, it is the *southwest* monsoon of summer which is used, without any doubt. Not only do the *Periplus* and Pliny mention the *season* in several passages—you leave Egypt in July; not only do they both name the *direction* of the Hippalus wind—southwest or west; but the *Periplus* expressly states that the voyage is dangerous, a qualification which is applicable only to the southwest monsoon.

But granting the fact, we have still to seek for an explanation. The problem is one which readily occurs to the mind of any modern sailor who knows the Indian Ocean. When the southwest monsoon is on, from June to October, the wind is generally boisterous and the sea rough; sometimes no sailing ship can face it. Moreover the Malabar coast lacks harbors, and it is not safe to remain offshore in a strong westerly wind. The practice of modern Arab vessels in sailing from Aden is to set out in winter and, after "ghosting" along in the lee of the Ḥaḍramawt coast, to fall away before the *northeast* monsoon from a point sufficiently north and east. In this they find no difficulty. Why, then, did the Greeks and Romans choose to make the voyage at another season full of hazard?

An answer to this question is necessarily somewhat speculative. The safest approach is to start from the reason given by both our authorities: the voyage with the southwest wind is made *because it is faster.* Pliny's "forty days" from Ocelis to Muziris does not seem particularly fast; but at any rate it must have been faster than the coasting voyage previously made. That provides the direct meaning of "faster." But, if the northeast monsoon could have been used at all on the outward voyage, the statement also implies that the southwest was faster than this too—otherwise the Greeks would have sailed out with the northeast. Now there are two re-

spects in which the northeast monsoon might present some disadvantage to Greek ships coming from Egypt. One is that, in setting out down the southern part of the Red Sea, they would meet with opposing southeast and east winds which prevail there before and during the whole season of the northeast monsoon, which extends from November to March. Secondly, when they came to the Indian Ocean, the vessels of the Greeks (presuming they were square-rigged as in the Mediterranean) could not sail so close to the wind as Arab fore-and-aft craft; so they would have to proceed far along the coast of South Arabia before they could turn toward India with a northeast wind. Using the southwest monsoon, on the other hand, they would avoid both these difficulties. For a northwest wind prevails in the southern part of the Red Sea during the summer months—which explains why it was thought well to leave Egypt in July. Then in the Ocean ships could sail straight on before the southwest monsoon in August, and arrive off the Malabar coast after the beginning of September, when it is comparatively safe. The passage would be rough but swift. Somehow or other Hippalus learned to make it, "by observing the location of the ports and the conditions of the sea." Other Greeks followed him, improved upon him, and continued to reach India in this daring way for two hundred years or more.[27]

A question may now be asked about the Arabs. How were

[27] *Periplus*, ch. 57 (quoted); Pliny, *N.H.*, bk. VI, ch. 26. The passage of *Periplus* is corrupt, but the general meaning is clear: I have quoted Schoff's translation. On the date of Hippalus: Otto and Bengtson, *loc. cit.*, have analyzed the evidence closely and put him with Eudoxus; Rostovtzeff, *loc. cit.*, is inclined to the same view. Tarn has shown from Pliny that Hippalus cannot well be put later than 90 B.C., *The Greeks in Bactria and India* (Cambridge, 1938), pp. 366-73. On sailing conditions in the Indian Ocean: I am indebted to Mr. A. J. Villiers for valuable information. See C. N. Parkinson, *Trade in the Eastern Seas, 1793-1813* (Cambridge, 1937), p. 106; W. W. Clemesha, "The Early Arab Thalassocracy," in *Journal of the Polynesian Society*, vol. LII (1943), pp. 110-31: the author's geography is better than his history. *The Red Sea and Gulf of Aden Pilot*, ch. 1; Cary, *Geographic Background to Greek and Roman History*, pp. 204-5. On Nearchus: Arrian, *Indica*, ch. 21, sec. 1.

they sailing to India? There is, as far as I know, no direct evidence for this period. But we may make some inferences from other evidence. First of all, if Hippalus sailed with the southwest monsoon, and this was a *discovery*, then surely it is not the way the Arabs were sailing before him. Secondly, whereas Greek ships were solidly built with nails, those of the Arabs were sewn with stitches of coconut fiber; they were fair-weather craft which would fall apart in heavy seas. It is extremely unlikely that they ever went out in the southwest monsoon. Two routes are left. The Arabs may have coasted all the way along Arabia and Iran. The Greeks did this before Hippalus, and it is quite probable that they were following Arab practice. Or the Arabs may have used the northeast monsoon in the manner described above, as they do today and almost certainly did in the Middle Ages. This too is reasonable. Very likely both routes were in use.

Concerning the first century B.C. we know little before the end of the Roman Republic. But it is likely that the volume of shipping from Egypt to India declined during the weak rule of the later Ptolemies and the confusion of the Roman civil wars. Strabo is probably referring to this period when he says that "formerly not even twenty ships [annually] dared to traverse the Arabian Gulf [Red Sea] so as to come out beyond the straits. . . ."[28]

With the restoration of peace to the Mediterranean world by Augustus (31 B.C.-A.D. 14), communications were improved, and the general prosperity stimulated an increased demand for Oriental luxuries in Rome, Alexandria and other large cities. The whole period of the Julio-Claudian and Flavian emperors (31 B.C.-A.D. 96) was a golden age for Greco-Roman commerce with India and Arabia. Quite early in the Principate of Augustus, Strabo reports that, in contrast with the former state of affairs, no fewer than 120 ships were now sailing in a single year from Myus Hormus to India. In

[28] Strabo, bk. XVII, ch. 1, sec. 13 (quoted).

the time of Nero (A.D. 54-68) Pliny complains that the Roman Empire was being drained of its currency, and records the extravagant amount of frankincense burned by that Emperor at the funeral of his second wife Poppaea. Large numbers of Roman coins have been found in India, and the existence of a temple of Augustus at Muziris in Malabar is evidence of a fair number of Greek and Roman merchants residing there. This trade has been frequently described, and I shall mention only its outstanding features, as revealed in the *Periplus* and Pliny. The western terminus for this traffic was Alexandria. From there, goods—wine, bronze, tin, gold, and various manufactured articles—were taken up the Nile to Coptus; from Coptus overland to Myus Hormus or Berenice. Sailing was made from these ports in large vessels. If South Arabia was their destination, the market for frankincense and other Sabaean perfumes was at Muza. But ships proceeding to India did not put in there; they took on water at Ocelis or Cane (thirty days' sail from Berenice). Those bound for the Malabar coast—Muziris (Mysore) or elsewhere—would then cut straight across the ocean. Pliny allows forty days from Ocelis to Muziris, and says that archers were carried aboard for protection against pirates. But if the destination was Barygaza (Broach) or any port of Northwest India, they coasted as far as Cape Syagrus before crossing the ocean. Another route was to keep to the African shore as far as the Cape of Spices, and perhaps call at Socotra before setting a course for India. In Northern India cargoes of silk, cotton, and other fine cloths were loaded; in the South, jewels and pepper. Ceylon was known, although there was not yet any regular intercourse with it. But Strabo mentions that a few merchants had sailed as far as the mouth of the Ganges, and that ambassadors from there came to Augustus. Greeks from Egypt were also trading with ports of the Somali coast, and from Adulis in the kingdom of Axum as far as Opone, just

beyond the Cape of Spices. The main exports from this region were ivory, hides, cinnamon, and slaves.[29]

All this valuable traffic down the Red Sea was of sufficient importance to make it an object of Roman imperial concern. The traders had to be protected from piracy on the sea and extortionate demands in the ports, while at the same time they might provide a reasonable revenue to the treasury. To impress the South Arabians with Roman power and perhaps to occupy one of their capital cities, Augustus dispatched the Arabian expedition of Aelius Gallus (25/24 B.C.). This expedition, however, was ill-planned in that it followed the worst possible route, first sailing over a bad part of the Red Sea from the Gulf of Suez to Leuce Come, on the northwest coast of Arabia, and then marching for hundreds of miles over the terrible country of Western Arabia down to al-Yaman. With the land march we are not concerned, but Strabo gives an interesting short account of the sea crossing.

Strabo says: "The first mistake was to build long ships [oared warships], when there was and would be no war on the sea. For the Arabs are not very warlike even on land, but rather traders and merchants, and not at all warlike on the sea." The last phrase is a little too sweeping, for there had been Nabataean pirates in Ptolemaic times. But now the Nabataeans were dependent allies of Rome, and there was no other people in those parts who could put up any naval opposition. Realizing his error, Gallus built 130 transports (*skeuagōga*), which would be sailing vessels, requiring small working crews and holding a large number of troops. "And after many sufferings and hardships he came in fifteen days

[29] Strabo, bk. II, ch. 5, sec. 12; *Periplus; passim*, esp. ch. 57 (quoted); Pliny, *N.H.*, bk. VI, chs. 24, 26; bk. XII, ch. 41. On the route to Berenice: Strabo, bk. XVII, ch. 1, secs. 44-45. On Ceylon: Pliny, *N.H.*, bk. VI, ch. 24, the adventure of the freedman of Annius Plocamus. The account of Ceylon in this passage is quite fabulous. On the Ganges: Strabo, bk. XV, ch. 1, sec. 4. E. H. Warmington, *The Commerce between the Roman Empire and India* (Cambridge, 1928); M. P. Charlesworth, *Trade Routes and Commerce of the Roman Empire* (Cambridge, 1926); J. O. Thomson, *History of Ancient Geography* (Cambridge, 1948).

to Leuce Come in Nabataea, a large commercial port, after losing many ships—some with all aboard—because of the difficulties of the voyage but not because of any enemy."[30]

The attempt to control South Arabia may have been resumed with a Roman occupation of the port of Arabia Eudaemon, in the reign of Claudius (A.D. 41-54) or earlier. Such an event is reported in the *Periplus* in one brief sentence: "But not long before our time Caesar [Καῖσαρ] subdued it." But this statement has been much disputed. The most I shall maintain is that such an action was navally possible. The distance by sea from Myus Hormus or Berenice to Aden would be no more than from Puteoli to Alexandria. There would be no need for warships if the states bordering the southern portion of the Red Sea had none—and there is no sign that they had any. In that case, all that was required was some innocent-looking merchant ships filled with a few hundred Roman legionaries; once ashore, the forces of the local prince would be no match for them, even if they tried. The whole action would be considerably easier than the expedition of Gallus, or the Persian invasion of South Arabia by sea in the sixth century A.D.[31]

What is more certain is that at the time of the *Periplus* Rome was in alliance with the Ḥimyarite prince of Ẓafār in the Yaman mountains. The tribe of Ḥimyar, whom the Greeks called "Homeritae," were superseding the Sabaeans

[30] On the expedition of Gallus: Strabo, bk. XVI; quotations from ch. 4, sec. 23. Pliny, *N.H.*, bk. II, ch. 168, and bk. VI, ch. 160, mentions a brief excursion on the Red Sea by Gaius Caesar, grandson of Augustus, in 1 B.C.

[31] *Periplus*, ch. 26 (quoted). Older editors doubted the event and emended Καῖσαρ to the name of one or other South Arabian prince: see Müller and Schoff, *ad. loc.* The reading Καῖσαρ has been vindicated by more recent authorities: M. Rostowtsew, "Zur Geschichte des Ost- und Südhandels im ptolemäisch-römischen Ägypten," in *Archiv für Papyrusforschung*, vol. IV (1907-08), pp. 306 ff.; E. Kornemann, "Die historischen Nachrichten des Periplus maris Erythraei über Arabien," in *Janus*, vol. I (1921), pp. 61-62; W. Schur, "Die Orientpolitik des Kaisers Nero," in *Klio*, beiheft XV (Leipzig, 1923), p. 46; Frisk, pp. 110-11 on Καῖσαρ. But the event is still doubted by J. G. A. Anderson in *C.A.H.*, vol. X (Cambridge, 1934), pp. 880 ff.: Anderson also gives good reasons for rejecting Schur's general theory.

as the leading South Arabian power. Their alliance, possibly combined with the presence of a Roman garrison at Arabia Eudaemon, would be sufficient to ensure the good behavior of the South Arabians.[32]

Greco-Roman intervention, commercial and naval, still left plenty of scope for Arab traders. The *Periplus* gives an account of their overseas trade in the middle of the first century A.D., at the same time describing the coasts of Arabia and neighboring countries. Starting in Northwest Arabia, it describes Leuce Come as a market of the Nabataeans for local shipping from Arabia. Beyond this the Arabian coast is foul and inhospitable and the beduin plunder and enslave those who are unfortunate enough to be shipwrecked on its reefs. Passing this country "as fast as possible" we come to al-Yaman where the people are more peaceful, and anchor off Muza, "a market-town established by law," at or near the modern Mukha.

". . . And the whole place is crowded with Arab shipowners and seafaring men, and is busy with the affairs of commerce; for they carry on a trade with the far-side coast [Eritrea and Somaliland] and with Barygaza, sending their own ships there." The next anchorage is Ocelis on the straits of Bāb al-Mandab, a mere watering-place for ships on their way to India. After this comes Arabia Eudaemon, "Arabia the Blessed," the only real harbor in the Arabian peninsula. As we have seen, this was in former times the mart for exchange of Indian and Egyptian goods. But now that it is no longer even a port of call for the Greek and Roman ships sailing to India, it has sunk to the rank of "a village by the shore," possibly enlivened by a Roman garrison. To the east of Arabia Eudaemon is Cane, Ezekiel's Canneh, at Ḥiṣn al-Ghurāb. "All the frankincense grown in the country is brought to it as a mart on camels and local skin-rafts and boats. And this place too has a trade with the far-side market

[32] *Periplus*, ch. 23.

towns, [and] with Barygaza and Scythia [the Indus valley] and Omana and the neighbouring Persis." Moscha and other small places on the Ḥaḍramawt coast are then mentioned; as well as the island of Socotra, which is a dependency of the "King of the Frankincense Country" (South Arabia), and is inhabited on its north coast by Arab, Indian and Greek traders.[33]

The passages quoted above show that Arab merchant ships from Muza and Cane were conducting a regular commerce with Barygaza. There is no evidence in the *Periplus* of Arabs further south than Barygaza; but it is very probable that they had been sailing to Malabar for centuries to fetch the timber of which their own ships were built (see Chapter III). What the *Periplus* mentions at Muziris, the chief port of Malabar, is Greek ships and ships—presumably Indian—from Ariace, the region round Bombay. It also notices very large Indian ships called *sangara* on the Malabar coast, and others called *colandia* voyaging to the Ganges. Indian ships are not mentioned anywhere on the coast of Arabia, although Ariace and Barygaza send their produce (including sugar) to the Somali coast of Africa.[34]

On the East African shore Arab merchants were found everywhere, as far south as Rhapta, near Zanzibar. Inside the Red Sea there was the young independent kingdom of Axum, founded by South Arabian colonists. In Somaliland and beyond, Arab princes were ruling, just as Zanzibar still had its Arab Sultan. Of Rhapta the *Periplus* says, "The Mopharitic chief [a Yamanite prince] governs it under some ancient right that subjects it to the sovereignty of the town that you come to first on the coast of Arabia [Muza]. The

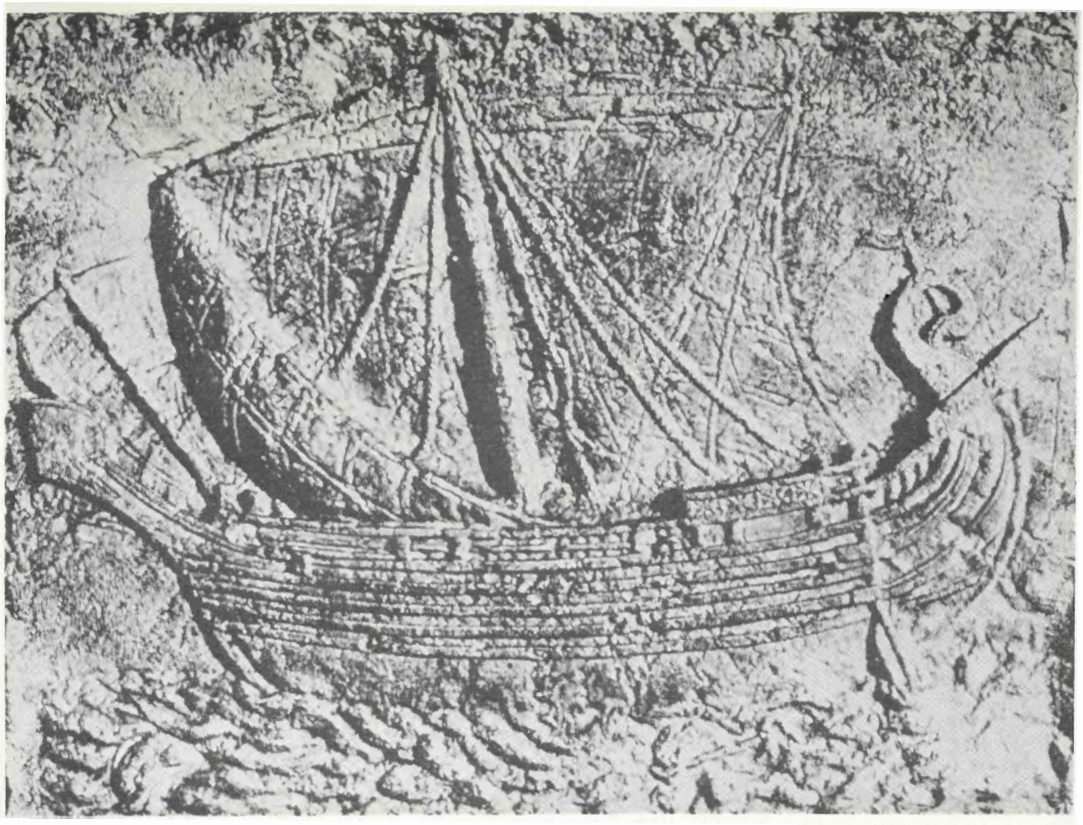
[33] *Periplus*, chs. 20-34; quotations from chs. 21 and 27.

[34] *Periplus*, chs. 54, 60, 14. It has been asserted that, early in the first century A.D., Sabaeans visited the court of the Chinese emperor, bringing him an African rhinoceros: A. Hermann, "Die Verkehrswege zwischen China, Indien und Rom," in *Veröffentlichung der Forschungsinstitut für vergleichende Religionsgeschichte a.d. U. Leipzig*, heft VII (1922), p. 8, quoted by Warmington, p. 370. I have not had access to this work.

people of Muza now hold it under his authority, and send thither merchant ships, on most of them employing Arab captains and agents, who are familiar with the natives and intermarry with them, and who know the coast and the language." Beyond Rhapta, writes our author, "the ocean is unexplored and bends round to the west."[35]

Under Trajan, Hadrian, and the Antonines (A.D. 98-192) the commerce between the Mediterranean world and the lands bordering the Indian Ocean continued to flourish. Trajan improved communications between the Red Sea and the Mediterranean. On the eastern side of the Red Sea he reduced (A.D. 106) the vassal state of Nabataea to a Roman province, "Arabia," and constructed a trunk road from Aela, at the head of the Gulf of 'Aqabah, through Petra and Bostra to Damascus. Aela now replaces Leuce Come as the main port of Nabataea. From these changes the Nabataeans were economically the gainers, for Petra was never more flourishing than in the second century A.D. On the Egyptian side Trajan cleared out the old canal which had silted up again since Ptolemaic days, and dug a new section at its western end, to bring it to the Nile at the Egyptian Babylon, on the site of Old Cairo; this would afford a better connection with the western or Canopic arm of the Nile delta, leading to Alexandria. Where Trajan's canal joined the Red Sea there now grew up the port of Clysma. These works of Trajan indicate that at this period the Gulfs of Suez and 'Aqabah were presenting no terrors to Greek and Roman sailors; one reason for this was the presence of a Roman fleet in the Red Sea, ready to chastise pirates. From Egypt during the reign of Hadrian (A.D. 117-38) there comes a remarkable inscription mentioning a prosperous, royally recognized guild of Palmyrene captains in the Red Sea. This caravan

[35] *Periplus*, chs. 7-10, 14, 16 (quoted)—see Frisk p. 109, on γενομένης—and ch. 18 (quoted). On modern Arabs in East Africa: A. Villiers, *Sons of Sindbad* (London, 1940).



3. A Roman Sailing Ship. From a sarcophagus, probably of the second century A.D., found at Sidon and now in the Beirut Museum. This is the type of grain ship which used to run between Alexandria and Rome. Notice the *artemōn* and small spritsail. From G. Contenau, *La civilization phénicienne* (Paris, 1926), p. 272.

4. The Ajanta Ship. From a fresco in a cave at Ajanta, N.E. of Bombay. Perhaps c. A.D. 630. The three square sails appear junk type, taller than broad. Notice the bow spritsail; the oculus or eye painted at the bows; the jars on the poop deck; the two side rudders; the jib sail. Photograph from *Ajanta, The Colour and Monochrome Reproductions*, ed. G. Yazdani and others (Oxford, 1930), Part II, Plate 42.

people, accustomed to organizing commercial expeditions over vast distances, found no difficulty in transferring their efforts to the sea, even though their city was in the middle of a desert.[36]

The *Geography* of Ptolemy Claudius (c. A.D. 150-160) shows that during the period of the Antonines the Greeks had a greater knowledge of the Indian Ocean than in the time of the *Periplus* and Pliny. They were now coasting along East Africa as far as Rhapta. They were more familiar than the writer of the *Periplus* with the remoter coasts of Arabia as far as 'Umān. In Southwest Arabia Ptolemy mentions the markets of Muza, Ocelis, Cane, and *Arabias emporion* at Aden—the old Arabia Eudaemon. Greeks were now sailing to Ceylon, of which Ptolemy gives a description. Inside the Bay of Bengal, they knew the mouth of the Ganges, and a few adventurers had sailed to the Malay Peninsula, "The Golden Chersonese." Beyond this a certain Alexander had penetrated to the port of "Cattigara." The later annals of the Han emperors reveal that Alexander was followed by others, and give more indication than Ptolemy of where "Cattigara" was: In A.D. 166 "the king of Ta-ts'in, An-tun [Marcus Aurelius Antoninus] sent an embassy who from the frontier of Jih-nam [Annam] offered ivory, rhinoceros horns and tortoise-shell. From that time dates the direct intercourse with this country. The list of their tribute contains no jewels whatever, which fact throws doubt on the tradition." The "embassy" probably consisted of merchants crossing from East Africa, for their "tribute" did not contain Mediterranean valuables, but African products. The fact that no jewels are mentioned rather confirms than throws doubt on the tradition. These spectacular voyages, from Egypt to

[36] Dio Cassius, bk. LXVIII, ch. 14; Ptolemy Claudius, *Geography*, bk. IV, ch. 5, sec. 14; Eutropius, *Breviarium*, bk. VIII, ch. 3, sec. 2. *Années d'Epigraphie* (1912), no. 171. *Economic Survey of Ancient Rome* (Baltimore, 1933-40), vol. II, no. 235, p. 384—see also p. 344. *C.A.H.*, vol. XI, pp. 236-38, R. P. Longden. Warmington, pp. 92 ff.

the borders of China, distinguish the Greeks who made them as the forerunners of the Persians and the Arabs in Far Eastern waters.[37]

During the third century, with the economic decline of the Roman empire and the depreciation of the currency, all this Greek traffic withered away. Our sources are meager, but the fact is sufficiently proved by the almost complete absence of Roman coins in India after Caracalla (212-217).[38]

THE SASSANID AND BYZANTINE EMPIRES

In Iran, the Parthians gave way to the Persian Sassanid dynasty around A.D. 225; in the Mediterranean empire, Constantinople became the capital in place of Rome (330). Persian nationalism on one side, and the eastward shift of the center of power on the other, tended to sharpen the conflict of the two great empires; and this tendency was increased by the religious conflict between Mazdeans and Christians. In South Arabia, the Ḥimyarites had absorbed the Sabaean and other kingdoms into a united state. Across the Red Sea, the Abyssinian kingdom of Axum was growing in power.

Our sources for the third, fourth, and fifth centuries are of the poorest. The lively curiosity of the ancient Greeks, embracing every side of life, gives way in literature to an excessive attention to the well-being of the soul. Arab historians and geographers of later centuries supply little independent information of any value concerning a period so long before Islam. The surviving Persian literature of this period, and the Syriac writings of any period, are almost entirely religious; while the various literatures of India have always been unrivalled in their aversion to mundane matters of fact.

[37] Ptolemy, bk. I, ch. 9, secs. 1 and 13-14; ch. 17, secs. 2-5; bk. VI, ch. 7; bk. VII, ch. 4. *Hou-han-shu*, ch. 88; Eng. tr. Hirth, *China and the Roman Orient*, p. 42 (quoted). Warmington, pp. 106-33.

[38] M. Rostovtzeff, *Social and Economic History of the Roman Empire* (Oxford, 1926), pp. 146-49, 421, with notes.

II. THE MIDDLE EAST IN GRAECO-ROMAN TIMES

Thus we can obtain no more than a few isolated glimpses of Oriental navigation in this age.[39]

The Sassanids seem to have encouraged native Persian seafaring, which had never flourished before. The first emperor Ardashir I (225-241) founded many sea and river ports. Narseh (293-302) had relations with the "Zand Afrik Shah," i.e. the king of the Zang nation of Eastern Somaliland. Early in the fourth century we find the Arabs of al-Baḥrayn and the coast behind it crossing the Persian Gulf to raid the Persian Empire (c. 310); a few years later the Sassanid monarch Shapor II repaid the visit, slaughtering many of the people of al-Baḥrayn and settling Persian colonists there. Later in the century the Latin historian Ammianus Marcellinus, in describing the Sassanid realm, states that there is much navigation on the Persian Gulf, and that the terminus for seagoing ships is "Teredon" at the Euphrates mouth—the recurrence of this ancient name is surprising. The neighboring Arabs are described as possessing several sheltered ports as well as anchorages, and as being well able to exploit the riches of both land and sea. A Chinese chronicle embracing the period A.D. 386-556 once more reports that "from the western boundary of Parthia [now Persia], following the crooked shape of the sea-coast, you can also go to Ta-ts'in [Syria], bending around over 10,000 li [1000 miles]." In the fifth century, another Chinese source records sea trade between China and India, East Africa and Syria; to judge from slightly later conditions, the Chinese ships probably met those from the western side, whatever they were, in the ports of Ceylon. The Chinese pilgrim Fa-hien observed "many Sabaean (*Sā-Bo*) merchants" in Ceylon in 414.[40]

[39] On Pahlavi literature: E. G. Browne, *A Literary History of Persia* (Cambridge, 1929), vol. I, pp. 7, 104-10.

[40] Ṭabari, *Annals*, ed. M. J. de Goeje and others (Leyden, 1879-1901), pt. I, vol. II, pp. 820, 836, 838-39; Ammianus Marcellinus, *Res gestae*, bk. XXIII, ch. 6, secs. 11 and 45-46; *Wei-shu*, ch. 102 = Hirth, p. 48 (quoted); *Sung-shu*, ch.

The extent to which Greco-Roman intercourse with India declined during these centuries is shown by the fact that the very name of "Indians" was often now transferred by writers to the Abyssinians and Ḥimyarites. At the risk of appearing to beg the question, I would maintain that this interpretation must be applied to the two following statements occurring as early as the second half of the third century. In the time of Gallienus (253-268), we learn that the rebel "emperor" Aemilianus in Egypt was preparing an expedition against "the Indians" when he was captured; again, Firmus, the wealthy Oriental merchant, "frequently sent merchant ships to the Indians" from Egypt (c. 275). It is unlikely that the real Indians are meant in these passages. Toward the end of this century an Axumite king sent an expedition from his port of Adulis which subdued the Arabs of the coast of al-Ḥijāz and suppressed for a while their age-long piracy and brigandage. Soon after that al-Yaman was invaded and Ḥimyar was included in the kingdom of Axum; but this position did not last long, for before the middle of the fourth century Ḥimyar was independent again. In about 345 a Christian mission of the Arian persuasion went there, led by Theophilus, an "Indian" originating from the island of "Dibos," possibly Socotra (Dvipa Sukhatara). This mission founded a church at Adane (Arabia Eudaemon), which was a marketplace and port for Greco-Roman merchants; in other words, they were sailing here regularly from Egypt and had a colony of traders numerous enough to require a

97 = Hirth, p. 46; Cosmas, bk. XI, sec. 336. E. Herzfeld, *Paikuli*, vol. I (Berlin, 1924), p. 119: inscription of Narseh, line 45. H. Hasan, *A History of Persian Navigation* (London, 1928), pp. 59 ff. *The Travels of Fa-Hien*, Eng. tr. J. Legge (Oxford, 1886), p. 104.

G. Ferrand, "L'element persan dans les textes nautiques arabes," in *Journal Asiatique*, vol. CCIV (April-June 1924), pp. 193-257, goes too far in claiming that Arabic *Zang* or *Zanj* is taken from Persian *Zank* or *Zanch*. It would be strange if the Arabs borrowed from the distant Persians a name for their own neighbors in East Africa. The Greek forms *Azania* (*Periplus*, ch. 16) and *Zingis* (Ptolemy, *Geography*, bk. IV, ch. 7, sec. 4) prove that this name was in use long before the Persian commerce began.

church. The ports at the northern end of the Red Sea were Clysma and Aela; Leuce Come is no longer mentioned, although it was still in existence as late as the end of the third century.[41]

Strongly contrasted with this long obscurity is the considerable information available for the second quarter of the sixth century. Procopius, the historian of the reign of Justinian, includes in his *Persian Wars* an illuminating short section on events and places around the Red Sea. The theoretical geographer Cosmas Indicopleustes is able to write from personal knowledge of commerce in the Red Sea and beyond, since he had visited Adulis as a merchant in his younger days and once sailed beyond Bāb al-Mandab. The *Martyrdom of St. Arethas*, of unknown authorship, gives an account of an Abyssinian invasion of al-Yaman. These authors are supplemented by a few passages in John Malalas, al-Ṭabari, and others.

The commercial situation at this period was as follows. Ceylon was the *entrepôt* for sea trade between China and the Near East. Ships of the Chinese and other Far Eastern nations used to sail as far west as Ceylon, and from here westward the trade was in the hands of the Persians and Axumites. Greek merchant ships used to sail as far as Adulis or occasionally a little beyond Bāb al-Mandab. Of Arab navigation we hear nothing at all.[42]

Persian nautical activity in the sixth century is marked. Cosmas shows Persian vessels entering the ports of Ceylon, and a Nestorian missionary movement sending out Persian

[41] *Historia Augusta*, bk. XXIV, ch. 22, sec. 8; bk. XXIX, ch. 3; Cosmas, bk. II, secs. 142-43 (the second Adulis inscription); Philostorgius, *Church History*, bk. III, chs. 4-6. On the meaning of "Indians": Philostorgius, bk. II, ch. 6; Procopius, Cosmas, etc. *passim*. E. Littmann and others, *Deutsche Aksum-Expedition*, 4 vols. (Berlin, 1913); C. Rossini, "Expeditions et possessions des Habaṣāt en Arabie," in *J. As.*, 11th Series, vol. XVIII (July-September 1921), pp. 5-36; Kammerer, *La mer rouge*, pt. I, vol. III, pp. 207-10, 214-15; N. Rhodokanakis in *Handbuch der altarabischen Altertumskunde*, vol. I (Copenhagen, 1927), pp. 115-16.

[42] J. B. Bury, *History of the Later Roman Empire* (London, 1923), vol. II, pp. 316-33.

bishops to the island. Persians were the intermediaries for the silk trade between China and the West, both by the Central Asian route from the "Seres" and the sea route from the "Sinae"; that which came by sea was bought by them in the markets of Ceylon and shipped to their ports in Persia. The very name of China as known to Cosmas is Persian in form: "Tsinistan." "Beyond Tsinistan," says the pious geographer, "no one either sails or dwells." It is also probable that Persian ships were sailing from al-Ubullah (Apologus) to China before Islam, and it is less probable but possible that Chinese ships were reaching the Persian Gulf. The evidence on these questions is examined in an appendix to this chapter. The Persians established churches in the ports of Male in Malabar and Calliana near Bombay. The Arab geographer ibn-Rustah says that before Islam seagoing ships from India used to sail up the Tigris as far as al-Madā'in (Ctesiphon). Al-Ṭabari gives the pre-Islamic name of al-Ubullah as "Farj al-Hind," i.e. "the marches of India"—so close were the relations by sea between this port and India. Al-Ṭabari adds that its Persian governor had to fight the Indians on the sea, thus giving an indication of Indian piracy in the Persian Gulf or the Gulf of 'Umān. In South Arabian waters, the Persians had their churches on Socotra. Persian ships are found at Adulis. No doubt they visited Ḥimyar, and this would provide some background to the Persian expedition against al-Yaman, to be mentioned below; but religious influences in al-Yaman at this time reflect connections principally with Axum and the Byzantine Empire.[43]

[43] Cosmas, bk. I, sec. 138 (quoted); bk. III, secs. 178-79; bk. XI, secs. 336, 338; *Martyrdom of St. Arethas*, ch. 27 ff., in *Patrologia Graeca*, vol. CXV (Paris, 1890). Ibn-Rustah, *Kitāb al-A'lāq al-Nafisah*, p. 94, in *Bibliotheca Geographorum Arabicorum*, vol. VII (Leyden, 1879 sqq.); Ṭabari, pt. I, vol. IV, p. 2023. Theophylactus Simocatta, *Histories* (Teubner), bk. V, chs. 7, 8: Persian Jews traded in the "Erythraean Sea," i.e. the Indian Ocean and possibly the Red Sea; but it cannot be assumed that they were also navigators or shipowners. U. M. de Villard, "Note sulle influenze asiatiche nell' Africa orientale," in *Rivista degli Studi Orientali*, vol. XVII (July 1938), pp. 303-49. References to the Chinese traffic are given in the Appendix to Ch. I.

It is surprising to find Abyssinians sailing the seas, for we do not think of them as a seafaring people. But Cosmas reveals the sailors of Adulis in Singalese harbors, and this is confirmed by Procopius. In the verses of Ṭarafah quoted at the beginning of this chapter, a ship is described as "'Adūlīyah" or "'Adawlīyah"; if this means "ship of Adulis," it indicates the presence of such ships in the Persian Gulf, for it was with these waters that the poet of al-Ḥīrah was familiar. The ivory which, according to Cosmas, was exported from Axum to India and Persia, Ḥimyar and the Roman Empire, may well have been carried in Abyssinian bottoms.[44]

Greek traders in the Red Sea were taking two routes. One led from Alexandria up the Nile, over the desert to some seaport, down the Red Sea to Adulis, and then if necessary up to Axum, the inland capital of Abyssinia. The other route started from Aela and kept close to the Arabian shore; ships used to anchor at night at one of the natural roadsteads of that coast, for fear of its shoals. The destiny might be a Ḥimyarite port: there were also Greeks on Socotra; but there is no doubt that Adulis was now the main commercial center of exchange between the Byzantine Empire and the countries of the Indian Ocean.[45]

Persians, Abyssinians, Greeks. Even the men of "Barbaria," North Somaliland, have become navigators. What has happened to the Arabs? If Cosmas and the other writers pass over their shipping without a single mention, that does not prove that it was non-existent; but it does make it plain that

[44] Cosmas, bk. XI, 336-39; Procopius, *Persian Wars*, bk. I, ch. 20, secs. 9-13; Ṭarafah, *Mu'allaqāt*, no. 2, line 4. S. Fraenkel, *Die Aramäischen Fremdwörter im Arabischen* (Leyden, 1886), p. 216: Fraenkel has a chapter on "Schiffahrt und Seeverkehr," pp. 209-32.

[45] Malalas, bk. XVIII, 456-59; Nonnosus, fragment in *Historici Graeci Minores*, vol. I, pp. 474-75; Procopius, *Persian Wars*, bk. I, ch. 19, secs. 1-16, ch. 20, sec. 4; Cosmas, bk. I, sec. 139, bk. II, sec. 140, bk. III, secs. 178-79. Antoninus Martyr, *De locis sanctis* (c. A.D. 570), in *Itinera Hierosolymitana*, ed. Tobler and Molinier, vol. I, pp. 113, 115, mentions "Abila" (Aela?) and Clysma as termini for ships from "India."

it was now playing no noteworthy part on the high seas. This decline was one aspect of the general economic decline of South Arabia in the sixth century. It was soon followed by the political subjugation of Ḥimyar by non-Arabian powers, which lasted till Islam. In 524/525 Ela Atzbeha, King of Axum, after careful preparations dispatched a large expedition from Adulis which crossed the sea and landed in al-Yaman. Although the landing was opposed on the beaches, it is noticeable that the Ḥimyarite tyrant, Dhū Nuwās, had no fleet with which to fight the enemy on the sea. The Abyssinians established a dominion in Ḥimyar; in justification they could proudly claim both their Arab origin and their Christian mission.[46]

Soon after (531), Procopius records an embassy to Axum from the Christian emperor Justinian, which illustrates the economic rivalries of the age. Justinian requested the Abyssinians "that they should buy silk from the Indians [of India] and sell it to the Romans; thus they would make a lot of money, while they would only be bringing this gain to the Romans, that they [the Romans] would no longer be forced to send their own money to their enemies [the Persians]." The Abyssinians agreed, but were unable to fulfill their promise. "For it was impossible for the Ethiopians to buy silk from the Indians, because the Persian merchants present at the very ports [of Ceylon] where first the ships of the Indians put in, since they inhabit a neighbouring country, were always accustomed to buy the entire cargoes." The neighbor-

[46] *Martyrdom of St. Arethas*, ch. 27 ff.; Procopius, bk. I, ch. 20, secs. 1-2. Malalas, bk. XVIII, secs. 433-44; Ṭabari, pt. I, vol. II, pp. 926, 929; Cosmas, bk. II, secs. 140-41. Bury, *Later Roman Empire*, vol. II, pp. 322 ff. Bury thinks there was another Abyssinian invasion a few years earlier, but there is no real indication of this. Ṭabari says that the Abyssinian king had no ships to transport his troops across the sea, and that the Roman emperor sent him some; but we know from the Greek writers that the Abyssinians had merchant-ships. The relevant chapters in the Syriac *Book of the Ḥimyarites*, ed. A. Moberg (Lund, 1924), are unfortunately missing; the editor shows that this was the main source of the *Martyrdom of St. Arethas.*

hood of the Persians to Ceylon is not a convincing reason; the truth probably is that the Persian merchants were long-established customers and the Singalese did not wish to offend them by doing business with rivals. Twenty years later, however, the problem was solved for the Byzantine Empire by the introduction of silkworms, brought secretly overland from China to the West.[47]

The kings of Axum were unable to maintain a firm control of their possessions in Arabia. The governor Abrahah and his troops revolted (c. 540), and two expeditions failed to subdue them. In the end the governor's authority was recognized on payment of a tribute. This petty princedom lasted for some thirty years, until the Persians wrested it from the Abyssinians (c. 570). The Sassanid emperor Khusraw Anushirwan was responding to an appeal from the Ḥimyarites. According to the most detailed account, he sent out eight ships with 800 released prisoners aboard under a certain Wahriz; after the loss of two of the ships at sea, the surviving 600 men landed and overthrew the Abyssinian governor. This conquest was made possible by the support of local forces. A Ḥimyarite was first set up as a dependent prince, but he was unable to maintain himself against the Abyssinians; thereafter Persian governors ruled with a reinforced Persian garrison until the Moslem conquest.[48]

Thus it happened that in the lifetime of the Prophet the Ḥimyarites were of small account in Arabia. By the mysterious process of history the center of vitality had shifted to the northern Arabs, to the kingdoms of al-Ḥīrah and Ghassān

[47] Procopius, *Persian Wars*, bk. I, ch. 20, secs. 9-13 (quoted); Eng. tr. H. B. Dewing in Loeb classical library (London, 1914 sqq.); Malalas, bk. XVIII, secs. 456-59; cf. Nonnosus in *Hist. Gr. Min.*, vol. I, pp. 474-75, the later embassy of Nonnosus. Malalas adds that the Abyssinians were asked to bring goods through the Ḥimyarite country which they were ruling. This points to some Ḥimyarite share in the Indian trade. On silkworms: Procopius, *Gothic Wars*, bk. IV, ch. 17.

[48] Procopius, *Persian Wars*, bk. I, ch. 20, secs. 3-8; Ṭabari, pt. I, vol. II, pp. 898, 948, 957-58 etc. T. Nöldeke, *Geschichte der Perser und Araber zur Zeit der Sassaniden* (Leyden, 1879), notes on pp. 166, 223, 224, 236-37.

and the still unrevealed forces of central Arabia. Now these people were not seafarers: by geographical fate their lives were bound up with the caravan traffic running from south to north, carrying the wealth of Africa and Asia to the two imposing empires of the Near and Middle East. It is true that the *Koran* shows a vivid awareness of the sea, and illustrates God's bounty by many references to its benefits and its perils. It is true also that the Quraysh of Mecca were in close relation with Abyssinia across the Red Sea—witness the emigration of some of the first Moslems to that country (c. 615). But it appears that the Quraysh had no ships of their own, for they were unable to pursue the fleeing emigrants onto the sea. They would rather wait for foreign ships to be wrecked on their shore; the wood of a wrecked Greek vessel was taken for use in the roof of their Ka'bah. The pre-Islamic poetry of the desert Arabs seldom contains more than a passing reference to the sea.[49]

On the east coast, al-Baḥrayn and 'Umān had their shipping, for we find the Arabs making raids from there immediately after Islam. But there was a strong Persian element in their ports and they had become more or less dependencies of the Sassanid Empire; many of the Azdite Arabs of 'Umān had become Mazdeans. In the port of al-Ubullah, the maritime population may well have been a mixture of Persians

[49] *Koran* 6:97 (stars are guides on the sea—i.e. astral navigation was familiar); 10:23-24 (perils of the sea); 16:14 (benefits of the sea); 11:40-41 and 54-12 (the Ark); 25:55 and 35:13 (the two seas, salt and fresh). Ṭabari, pt. I, vol. III, pp. 1135, 1181-82, 1640-41, 1645, 1685-86; Balādhuri, *Futūḥ al-Buldān*, ed. M. J. de Goeje (Leyden, 1866), pp. 77-78. W. Barthold, "Der Koran und das Meer," in *Zeitschrift der Deutschen Morgenlandischen Gesellschaft*, n.s. vol. VIII (1929), pp. 37-43. The "ports" of al-Ḥijāz, if such they can be called, were al-Shu'aybah and al-Jār; Juddah is also mentioned (Ṭabari, pt. I, vol. III, p. 1645), but the name is probably an anachronism. There was an Abyssinian community at Mecca, including mercenary troops and the slave Bilāl, the first *mu'adhdhin*; Ethiopic loan-words in Arabic nautical vocabulary, see Fraenkel, *Aramäischer Fremdwörter*, pp. 210-15; the shipowners of al-Shu'aybah may have been Abyssinians, see Barthold.

and Arabs; al-Ubullah was a frontier-town of the Persian Empire on the Arab border.[50]

The nautical weakness of the northern Arabs helps to explain the direction taken by the first Islamic conquest. We might have expected an expansion into the Sudan and Somaliland. The Prophet may well have written to the Negus of Abyssinia demanding his submission to Islam; but he had not the means in shipping to enforce his demand. There were of course other reasons why the Moslems took a northward direction. The Byzantine and Sassanid Empires were far more worth conquering in every respect than the poor kingdom of Axum; and they had just weakened each other heavily by the catastrophic Persian invasion of Syria and Egypt and its repulse (610-628).

APPENDIX TO CHAPTER I:
DIRECT SAILING BETWEEN THE PERSIAN GULF AND CHINA IN PRE-ISLAMIC TIMES

It has often been asserted that there was direct sea commerce between the Sassanid Empire and China. But the evidence is exiguous, and it is necessary to note carefully just what each passage shows. I shall discuss the relevant texts in turn.

(i) A Chinese traveler, I-ching, vol. II, fol. 5a, Eng. tr. J. Takakusu, *A Record of the Buddhist Religion* (Oxford, 1896), p. xxviii: "In the beginning of autumn [A.D. 671] . . . , I came to the town of Kwang-tung, where I fixed the date of meeting with the owner of a *Po-sse* ship to embark for the south. . . . At last I embarked from the coast of Kwang-chou [Canton]. . . ." The ship then carried him to Sumatra.

If *Po-sse* here means "Persian" (see Ch. II, p. 62, and note 57), then there was Persian navigation to China less than a quarter

[50] Balādhuri, pp. 78, 431-32; Ṭabari, pt. I, vol. IV, p. 2023, vol. V, pp. 2546-48. L. Caetani, *Annali dell' Islam* (Milan, 1905-26), vol. III, 16 A.H. sec. 328, discusses the nationality of Persian Gulf sailors. S.S. Nadvi, "Arab navigation," in *Islamic Culture*, vol. XV (October 1941), and vol. XVI (January, April and October 1942).

of a century after the overthrow of the Sassanids by the Moslems. But it does not seem likely that the Persians first began these enterprising voyages immediately after their defeat by the Arabs; it is far more credible that they date back to the Sassanid period.

(ii) This conclusion is confirmed by the statement of al-Balādhuri, *Futūḥ al-Buldān*, p. 341, and al-Ṭabari, pt. I, vol. V, p. 2383 (both apparently following the same tradition), that al-Ubullah at the time of the Moslem conquest was a port for ships from China, India, 'Umān and al-Baḥrayn. The phrase *sufun min al-Ṣīn*, "ships from China," in al-Ṭabari does not necessarily refer to Chinese ships. Even *sufun Ṣīnīyah* when used by Arab geographers and historians sometimes certainly means Moslem ships on the China run—e.g. in Buzurg, p. 85 (quoted in Appendix to Ch. III, *ad. init.*), a *marḳab Ṣini* captained by a Persian. (See below, Ch. II, p. 66.)

The evidence so far, then, allows us to consider it likely that there were Persian ships trading to China before Islam. Whether Chinese ships were reaching the Persian Gulf at this period is another matter. There are three passages, besides that of al-Ṭabari, which have been taken as evidence for such voyages: e.g. by J. T. Reinaud, *Relations des voyages faits par les Arabes* etc. (Paris, 1845), p. xxxv; H. Yule, *Marco Polo* (London, 1903), p. 83; L. Caetani, *Annali dell' Islam* (Milan, 1905-26), vol. II, pt. 2, 12 A.H., sect. 133, note 1, and vol. III, 16 A.H., sect. 328; E. H. Warmington, *The Commerce between the Roman Empire and India* (Cambridge, 1928), p. 138, and p. 358, note 146. But I shall try to show that none of the three passages is good evidence for Chinese voyages to the Persian Gulf.

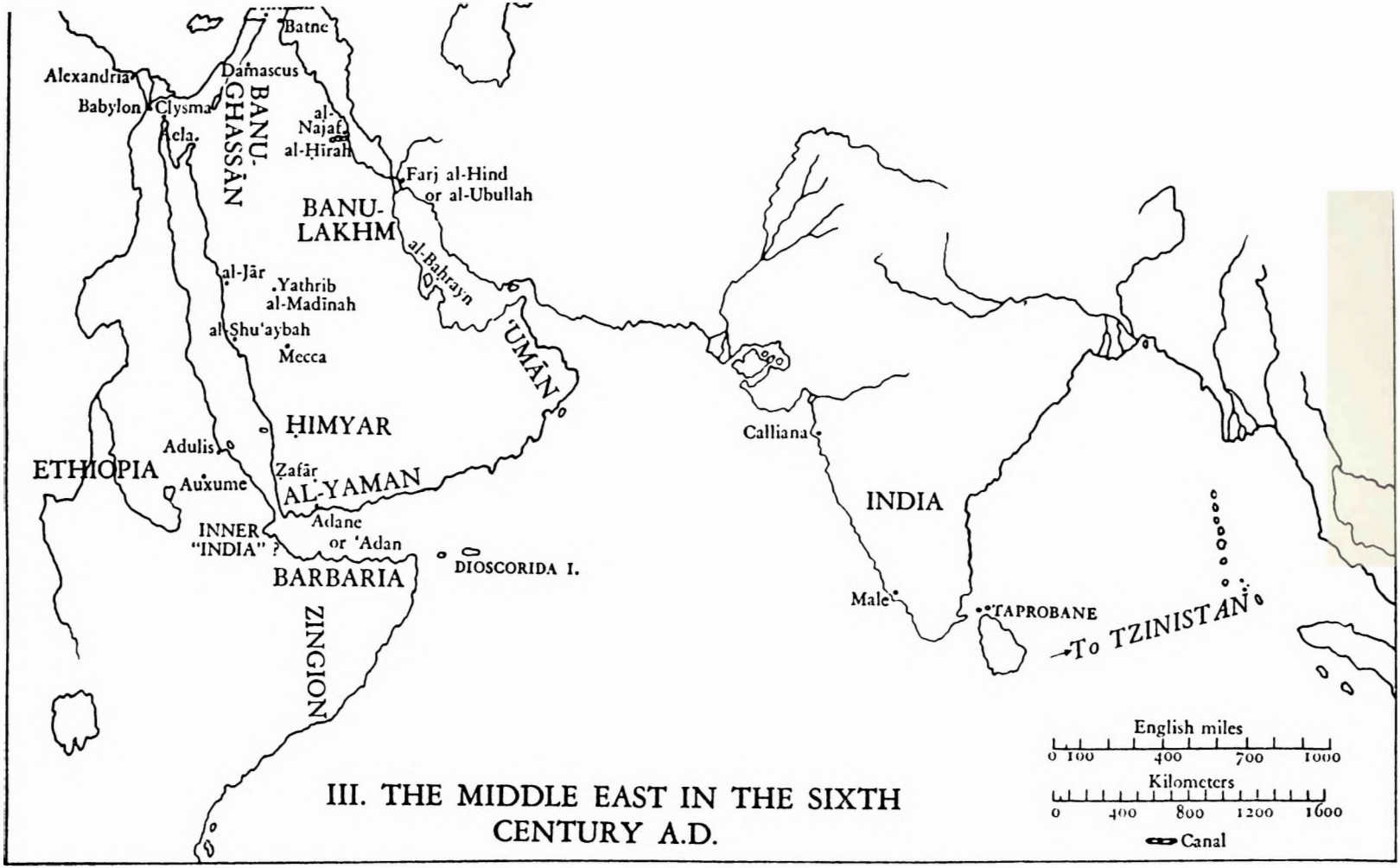
(iii) Al-Mas'ūdi, *Murūj al-Dhahab*, vol. I, p. 216: Formerly the Euphrates ". . . emptied into the Indian Ocean there [below al-Ḥīrah]. For the sea was then over the place known at the present time as al-Najaf; thither came the boats of China and India (*sufun al-Ṣīn w-al-Hind*) returning to the kings al-Ḥīrah." This assertion cannot be taken seriously, for the sea never came anywhere near al-Najaf in historic times. Its legendary character is confirmed by the parallel passage in vol. I, p. 219, where the assertion is said to be derived from a conversation of Khālid ibn-al-Walīd (c. 630) with an old man of 350 years!

(iv) Ammianus Marcellinus, bk. XIV, ch. 3, sec. 3: At Batne, near Zeugma on the Upper Euphrates, there was in the fourth century an annual fair in September to which a great crowd came, "to trade in what the Indians and Seres send, and very many other goods brought thither by land and sea." Warmington (*loc. cit.*) draws from this the conclusion that the Indians and Chinese sailed up the Persian Gulf to attend this fair. This conclusion is unwarranted. Batne was a natural place for a fair because it lay at or near the junction of two important trade routes: one from the Persian Gulf up through Mesopotamia by barge and camel; the other the caravan route across Central Asia and Parthia (see Isidore of Charax, *Parthian Stations*, p. 1). The question then is, by which route did the Chinese send their wares? The answer is given by the name "Seres": this always means the Chinese as approached overland, in contrast with the "Sinae." In any case, the passage does not even say that the Seres *came*, but only that they *sent* their goods.

(Warmington also refers to Procopius, *Wars*, bk. II, ch. 12, sec. 31, but this does not mention any fair; it merely describes Batne as "a small stronghold of no importance, one day's journey distant from Edessa.")

(v) *Sung-shu*, ch. 97 (covering A.D. 420-478) certainly shows Chinese shipping as far west as India, but I do not think we can extract more from it than this. As the passage is not entirely clear I quote it in full for the reader to judge: "As regards Ta-ts'in [Syria] and T'ien-chu [India], far out on the western ocean, we have to say that, although the envoys of the two Han dynasties have experienced the special difficulties of this route, yet traffic in merchandise has been effected, and goods have been sent out to the foreign tribes, the force of the winds driving them far away across the waves of the sea. . . . All the precious things of land and water come from there, as well as the gems made of rhinoceros horns and chrysoprase, serpent pearls and asbestos cloth . . . ; also the doctrine of the abstraction of mind in devotion to the lord of the world [Buddha]—all this having caused navigation and trade to be extended to those parts."—transl. F. Hirth, *China and the Roman Orient* (Leipzig, 1885), p. 46.

From all this I conclude that there is nothing to prove direct



III. THE MIDDLE EAST IN THE SIXTH CENTURY A.D.

Chinese sailings to Mesopotamia before Islam. Nor, I believe, do we find them for many centuries after Islam (see Ch. II, p. 75). Chinese sources on the subject support this conclusion; F. Hirth and W. Rockhill, *Chau Ju-Kua* (St. Petersburg, 1911), Introduction, p. 18, assert that Quilon in Southwest India, visited by Cantonese junks in the twelfth century, was the furthest point west ever reached by Chinese ships till the Ming dynasty.

II

TRADE ROUTES UNDER THE CALIPHATE

I there before thee, in the country that well thou knowest,
Already arrived am inhaling the odorous air:
I watch thee enter unerringly where thou goest,
And anchor queen of the strange shipping there,
Thy sails for awnings spread, thy masts bare;
Nor is aught from the foaming reef to the snow-capped, grandest
Peak, that is over the feathery palms more fair
Than thou, so upright, so stately, and still thou standest.
—R. Bridges, *"A Passer-By"*

GENERAL CONSEQUENCES OF THE ISLAMIC EXPANSION

It is no mere convention which divides our chapters at Islam. In every respect the *Koran*, the life of Muḥammad, and the early Moslem conquests constitute the greatest crisis in Arab history before the present century. In the history of Arab navigation three main results can be discerned.

1. The Arabs now stood on the shores of the Mediterranean. Although this move gave them access to the wealth and culture of Egypt and Syria, the total economic consequences were not wholly good. The Roman Empire had united the entire basin of the Mediterranean, so that commerce ran freely across its waters. In *Mahomet et Charlemagne*, Pirenne showed how this unity was essentially preserved through all the civil wars and invasions of the later

Empire, interrupted for a time only by the Vandal occupation of North Africa. The Persians by their break-through in the early seventh century would have ended it, had they not been quickly driven back. The Arabs ended it. "L'unité mediterranée est brisée." Pirenne asked why the Arabs were not absorbed by the empire which they conquered, as the Germans had been; and he found the answer in their religion. Christianity had reinforced the unity of the Mediterranean world; after the seventh century two rival faiths, supported by the organization of empires, stood facing each other across the narrow waters. Instead of a highway, the Mediterranean became a frontier, a sea of war—a change which ruined Alexandria.

One boon seems to have been brought by the Arabs to the Mediterranean: the lateen sail. This will be treated fully in the next chapter.

2. The Arabs occupied all the coasts of the Persian Gulf. They were able to take advantage of this gain, because at the same time they reunited in their empire the lands of Western Asia (except Anatolia), and Egypt. This economic area, first united politically by the ancient Persians, had been split in two by the successors of Alexander. We have seen the efforts of the western states to trade directly with the East via Egypt and the Red Sea. But the route of Mesopotamia and the Persian Gulf had an advantage in directness which could not be forgotten. Successive empires had tried to wipe out the unnatural frontier between Syria and Mesopotamia by overwhelming each other—Ptolemies and Seleucids, Romans and Parthians, Byzantines and Sassanids. Every attempt had failed. At last the Arabs, bursting in from the south, restored the unity of the ancient Persian Empire.

This provided some compensation for the new Mediterranean barrier. The Persian Gulf and the Red Sea were no longer rival routes to Rome or Constantinople; but they were coordinate routes to the nearer lands of the Caliphate.

While the Moslem empire remained one, these two routes were used side by side; the extent of their use depended mainly on the size and prosperity of the two markets of Mesopotamia and Egypt. The commerce between the Persian Gulf and India and China flourished greatly under the 'Abbāsids, so long as Baghdād was the metropolis of the Middle East. There was also traffic between the Gulf and East Africa, while the ancient routes from the Red Sea were revived.

3. The third change brought about by the Islamic expansion was of a more imponderable kind. It seems that men are always excited by new prospects caused by their own successful action, so that they display unusual enthusiasm in exploring and exploiting their possibilities. In this respect the medieval Arabs can be compared with the ancient Athenians after the repulse of the Persians, or the nations of Western Europe since the Renaissance. For several centuries the Arabs showed an unusual energy in all fields of life. This energy extended to warfare, travel, and commerce, as well as to literature of travel, geography and history.[51]

THE ARABS ON THE MEDITERRANEAN

When the first Moslems reached the coasts all round them, some of them displayed a tendency to go raiding across the sea. This was but an extension of the immemorial pagan practice of *ghazw* in the desert; one "rode a ship" (*raḳaba marḳab*) as one rode a camel, either for commerce or for spoil.

The first sea raids were made from the shores of Arabia. 'Uthmān the Thaqafite, governor of al-Baḥrayn, set sail from 'Umān in a daring raid on the Indian coast at Tānah near Bombay; he sent his brother to the bay of al-Daybul at the

[51] H. Pirenne, *Mahomet et Charlemagne* (Paris, 1937); quotation from p. 132. A. J. Toynbee, *A Study of History*, vol. I (London, 1934), pp. 75 ff., 349, on the unity of Western Asia.

mouth of the Indus (A.D. 636). The succeeding governor of al-Baḥrayn, al-'Alā', desiring to show his prowess and urged on by the Arabs of al-Baḥrayn, crossed over to Persia and penetrated far inland to Iṣṭakhr (Persepolis). But his ships were destroyed and he had to make a perilous march through hostile country to al-Baṣrah (638). These raids were carried out against the emphatic instructions of the caliph 'Umar ibn-al-Khaṭṭāb (634-44), and met with his stern disapproval when he heard of them. 'Umar was a man of al-Ḥijāz who regarded the sea as a dangerous element; and as a good Moslem, following the policy of the Prophet and abu-Bakr, he refused to risk the lives of Moslems on expeditions which served no useful purpose. Only once did 'Umar himself order such an excursion: against the Abyssinians in reprisal for their attacks on Arabian coasts (641). The expedition sacked Adulis, but met with a defeat on land. This confirmed the caliph in his caution.[52]

Next Mu'āwiyah, the governor of Syria, importuned 'Umar to allow him to raid Cyprus. 'Umar refused. Al-Ṭabari gives various versions of their correspondence; these are well combined into a single narrative in Muir's *Caliphate*:

"Mu'awiya had long keenly missed the support of a fleet, and in fact had sought permission from 'Omar to embark his soldiery in ships. 'The isles of the Levant,' he wrote, 'are close to the Syrian shore; you might almost hear the barking of the dogs and cackling of the hens; give me leave to attack them.' But 'Omar dreaded the sea, and wrote to consult 'Amr, who answered thus: 'The sea is a boundless expanse, whereon great ships look tiny specks; nought but the heavens above and waters beneath; when calm, the sailor's heart is

[52] Balādhuri, pp. 431-32; Ṭabari, pt. I, vol. v, pp. 2546-48, 2595. On India: M. Isḥāq, "A Peep into the First Arab Expeditions to India under the Companions of the Prophet," in *Islamic Culture*, vol. XIX (April 1945); and B. N. Bakhsh Khān as-Sindi, "The Probable Date of the First Arab Expeditions to India," in *Islamic Culture*, vol. XX (July 1946). On sack of Adulis: Kammerer, *La mer rouge*, pt. I, vol. III, p. 322.

broken; when tempestuous, his senses reel. Trust it little, fear it much. Man at sea is an insect on a splinter, now engulfed, now scared to death.' On receipt of this alarming account, 'Omar forbade Mu'awiya to have anything to do with ships: 'The Syrian sea, they tell me, is longer and broader than the dry land, and is instant with the Lord, night and day, seeking to swallow it up. How should I trust my people on its accursed bosom? Remember al-'Alā'. Nay, my friend, the safety of my people is dearer to me than all the treasures of Greece.' "

This well-known story, combined with the landwardness of Arabic literature, has been responsible for the popular impression that the Arabs have never been a seafaring nation. Conceived in this wide form, the impression is false, as can be seen from pre-Islamic history alone. What the story does show is that the northern Arabs at the time of Islam were not sea-minded; further, that 'Umar used common sense in restraining his generals from rash adventures. Behind the narrative, embroidered as it may be, lies the fact that the Arabs at first had no naval experience and perhaps an insufficient number of ships to pit against the Byzantine navy, should they encounter it. It will by now be clear that the maritime activity of the ancient Arabs was restricted to commerce and piracy. However many Yamanis, 'Umānis and Baḥraynis took part in the invasions of Egypt and Syria, their nautical knowledge would be quite useless in a sea battle.[53]

Yet in principle Mu'āwiyah was right. The situation in the Mediterranean was not as in the other seas. Here it was a necessity of defense to the new empire to create a naval power. It was not long since the Sassanids had lost their Near Eastern conquests because they had failed in this matter: Heraclius had made brilliant use of his advantage by landing troops on the coast of Cilicia and driving a wedge which

[53] Ṭabari, pt. 1, vol. v, pp. 2819-22. W. Muir, *The Caliphate, its Rise, Decline and Fall*, revised T. H. Weir (Edinburgh, 1924), p. 205 (quoted).

forced the enemy to evacuate Anatolia. The Arab army itself was for long unable to capture the island of Aradus (Arwād) and several cities on the Syrian coast, because they received supplies freely by sea from Constantinople. Alexandria fell the first time only through the collaboration of Cyrus-Muqawqis, Melkite patriarch and last Christian governor of Egypt. Then in 645 a Byzantine fleet under Manuel came back, entered the harbor without challenge, and retook Alexandria. Another Heraclius might have recovered Egypt permanently; as it was, Byzantine incompetence and Coptic neutrality permitted the recapture of this city which could have been impregnable to any land attack, even by the formidable forces of 'Amr ibn-al-'Ās. All these events pointed a plain lesson to the Arab generals on the spot, however a caliph in al-Madīnah might fail to see it.

At length Mu'āwiyah gained the consent of the third caliph 'Uthmān (644-56) to a punitive raid on Cyprus—on condition that he should take his wife with him. A successful raid on the island was made in 649; in the next year Aradus was captured. In 655, less than twenty years after the Arabs had first descended to the shores of the Eastern Mediterranean, an Arab fleet gained the big naval victory of Dhāt al-Ṣawāri, "the battle of the masts," off the Lycian coast near Phoenix. Before many years had passed the Arabs were raiding Sicily and threatening Constantinople itself with their fleet.[54]

In the following centuries the Arabs were always held in check in the Eastern Mediterranean by the Byzantine navy; indeed, its raids on the coasts of Syria, Palestine, and Egypt were long a cause of alarm. In the Western Mediterranean, Arab fleets achieved a dominating position, although the tendency to mere piracy was often in evidence. That history forms no part of the subject of this book. But perhaps it will

[54] A. J. Butler, *The Arab Conquest of Egypt* (Oxford, 1902), pp. 121-25; P. K. Hitti, *History of the Arabs*, 2nd ed. (London, 1940), p. 167; Caetani, vol. VII, 28 A.H., secs. 11-33.

not be considered a digression if I discuss the problem of the earliest Arab ventures on the Mediterranean: how could they be successfully carried out in such a surprisingly short time?

The decisive event is the battle of Dhāt al-Ṣawāri. To fight a naval battle, many resources were required: naval bases, including docks, shipbuilding yards, building materials and skilled shipbuilders; warships with their complements of trained sailors, marines and officers. Alexandria was a complete naval base, having a splendid harbor, capacious shipyards and Coptic builders; Egypt has always been a country of skilled craftsmen, and no doubt the Copts had profited from Greek science of which Alexandria had been the center ever since its foundation. The only thing lacking was good timber, in which Egypt is poor; this had to be brought from Syria or elsewhere. The ports of Syria, principally Acre and Tyre, were also bases from which a part of the fleet left for Dhāt al-Ṣawāri. But at this date there was no shipbuilding on the Syrian coast. It was established by Mu'āwiyah during his caliphate (A.D. 661-80), and we meet the strange statement that he transferred Persian workmen settled in Antioch, Ḥimṣ and Ba'labakk to Tyre, Acre and other ports—a sad comment on the decline of the Phoenicians, who had once built ships for Mesopotamian fleets!

The fleet which fought the battle, then, must have been constructed entirely in Alexandria. Certainly the Greeks took away all existing warships at the time of the first capitulation of Alexandria (641), so that the whole Arab fleet had to be built afresh. It must have consisted of *dromōnes* of the regular Byzantine type, fast and light warships with one or two banks of oars; the classical Mediterranean square sails would be used on the voyage but not in the battle. Who manned the fleet? We do not know anything about the Syrian squadron. But at least in the Egyptian squadron sailors, rowers, helmsmen etc. were Copts. This is not only probable in itself, but we know that in much later time the Copts continued

to be drafted into the navy. The *Aphrodito Papyri* (c. 710) reveal Copts being conscripted from Upper Egypt for the shipyards of Alexandria and for the annual *ḳoursa* (raids); they were even being sent to serve on fleets based on Syria. In the middle of the ninth century, Copts were still building ships in the coastal towns of the Delta, and sailing in the fleets; Bishop Severus ibn-Muqaffa' complains that around 855 they had to provide their own weapons and pay their expenses for the voyage to the base. By that time Moslems could be found occasionally to sail as substitutes for Christians, but at the time of Dhāt al-Ṣawāri the Arabs considered it beneath their dignity to work as sailors. The Arabs supplied the marines, who did the actual fighting. As for the admirals and captains, at least the higher ranks were Arabs. The Egyptian squadron was commanded by the governor of Egypt, 'Abdallah ibn-abi-Sarḥ, the Syrian squadron by abu al-Ā'war. They may have had Coptic lieutenants; but the Byzantine fleets had no doubt always been led by Greek admirals, who had all quitted Egypt; so that the Arabs were really handicapped by their lack of experienced naval commanders. But the tactical methods of the age made this handicap less serious than it might have been, as will be seen.

From Egypt went forth 200 ships, from Syria an unknown number. The object of the Arab expedition may have been to land on the Lycian coast and cut cypress trees for shipbuilding; a similar excursion to Phoenix in 715 is known to have had this purpose. The Byzantine fleet approached, 500 strong. The Arab tradition has it that the Arabs offered to fight it out on land, but the Byzantines chose a sea battle. Whether true or not, this probably reflects the attitude of the two parties before the battle. The tactics employed made it resemble a land battle, with the opposing vessels locked together and the men fighting with arrows and swords. This method of combat suited the Arab warriors. We are reminded of Roman tactics in the battle of the *corvi* (Mylae,

260 B.C.). But, since the conflict took place in open waters, it is hard to believe that the Byzantine fleet was forced to close quarters. Rather it seems to have been the manner of the age, for in 551 the battle of Sena Gallica between Ostrogoths and Greeks had followed just the same course. On that occasion the Greeks had won because they had kept good order, while the Goths were unable to keep the proper spacing between their ships. At Dhāt al-Ṣawāri evidently the Coptic crews played their part adequately, and enabled the Arabs to win the victory with their swords. Much blood was shed on both sides. After the battle the Arabs landed in Lycia.

Thus the battle was won by a combination of Coptic seamanship and Arab swordplay, with a minimum of admiralcy. Luck may have been with the Arabs; it usually sides with the more determined party.[55]

The use of Alexandria as a naval base by the Arabs did not save the city from a rapid decline. In its ancient glory we have seen it as the commercial center for trade between the Mediterranean world and the Orient. Although the Oriental trade had long been a mere trickle, Alexandria had remained a large market and port, in particular sending out the grain ships which supplied Constantinople as in former centuries they had supplied Rome. The first act of the new

[55] Ṭabari, pt. I, vol. v, pp. 2865-70; Balādhuri, pp. 117-18; ibn-'Abd-al-Ḥakam, *Futūḥ Miṣr*, ed. C. C. Torrey (New Haven, 1922), pp. 189-91; Theophanes, *Chronographia*, A.M. 6146 (A.D. 655). *Greek Papyri in the British Museum*, vol. IV, *The Aphrodito Papyri*, ed. H. I. Bell (London, 1910), introd., pp. xviii, xxxii-xxxv and nos. 1349, 1353, 1374, 1434, 1435, 1449. Severus ibn-Muqaffa', *History of the Patriarchs of the Egyptian Church*, vol. II, pt. I, ed. and transl. Y. 'Abd-al-Masīh and O. H. E. Burmester, 2 vols. (Cairo, 1943), fols. 115r, 124v. Caetani, vol. VIII, 34 A.H. secs. 18-39. On Sena Gallica: Procopius, *Gothic Wars*, bk. IV, ch. 24; Bury, *Later Roman Empire*, vol. II, pp. 258-60. On Phoenix in 715: *Cambridge Mediaeval History*, vol. II (Cambridge, 1913), p. 415, E. W. Brooks. On Byzantine warships: W. L. Rodgers. *Naval Warfare under Oars, 4th-16th Centuries* (Annapolis, 1939); C. Torr, *Ancient Ships* (Cambridge, 1894); R. H. Dolley, "The Warships of the Later Roman Empire," in *Journal of Roman Studies*, vol. XXXVIII (1948), pp. 47-53 and Plate V.

masters was to divert the corn of Egypt to feed the hungry citizens of al-Madīnah. For a year or two this was transported across the desert to Sinai and Western Arabia. But very quickly, even before the whole of Egypt was subdued, 'Amr reopened Trajan's canal using forced labor (641/642). The first fleet of 20 corn ships was then loaded at the wharves of Egyptian Babylon, sailed along the canal of al-Qulzum (Clysma), then down the Red Sea to al-Jār, the port of al-Madīnah (before 644). After that the canal was kept open, although it could now be used only at high Nile owing to the slow rise in the level of the ground which has been taking place in that part of Egypt in the course of the ages. The annual supplies continued to be sent, with interruptions, for many centuries. Probably they soon began to be unloaded at Juddah, the new port of Mecca. The population of Mecca itself was now much larger owing to the needs of the pilgrimage, and Juddah soon became the busiest port of the Red Sea.

'Amr also offered to extend a branch of the canal from Lake Timsāḥ northward to the Mediterranean, like the present Suez canal. But 'Umar refused permission for fear that Byzantine fleets might sail through to the Red Sea and interrupt the pilgrimages. It must be remembered that Egypt was not yet held firmly in the last years of 'Umar. Subsequently we should expect to find complete security in the Red Sea; so it is surprising to find al-Qulzum mentioned in the *Aphrodito Papyri* as a naval base (c. 710). Either the Arabians of the west coast had resumed their immemorial habits, or else the still unsubdued tribes of Nubia were attacking Moslem shipping. Babylon, too, appears as a naval base; its inland docks were safe from raids and it could send out fleets either to Alexandria or to al-Qulzum. Close to Babylon, al-Fusṭāṭ was becoming the new center of population in Egypt. Alexandria, which in its heyday contained a population of around 600,000, had barely 100,000 by 860; on the spot where the

church of St. Mark had been, there was now a monastery lying outside the city walls. The wonderful Pharos fell to ruin, and no one could be found who knew how to repair it.[56]

PERSIAN AND ARAB SEA TRADE WITH THE FAR EAST

In contrast with the Mediterranean, the Indian Ocean was a sea of peace. Its western shores were under Moslem control, and the nearest enemies were the pirates of Northwest India. Thus we find in this age a great expansion of commerce on the Indian Ocean.

As has been seen (Appendix to Chapter I), there is some slight evidence of Persian commercial voyages to China under the Sassanids. It has now to be shown how such voyages were probably taking place under the Umayyad caliphs, and how the Arabs inherited this traffic, prospering in it despite interruptions. This sea route, from the Persian Gulf to Canton, was the longest in regular use by mankind before the European expansion in the sixteenth century, and it merits attention as a remarkable achievement. The occurrence of sea trade between the Persian Gulf and China at this period of history was made possible by the simultaneous existence of large empires at both ends of the route. The whole Moslem world from Spain to al-Sind was united under the Umayyad caliphs (A.D. 660-749), and for over a century (750-870) under the 'Abbāsids with the exception of Spain and North Africa. In China, the T'ang dynasty (618-907) ruled a united empire until its closing years; the

[56] Ibn-'Abd-al-Ḥakam, pp. 22-24; Balādhuri, p. 216; Ṭabari, pt. I, vol. V, pp. 2576-77; Maqdisi (*B.G.A.*, vol. III), pp. 79, 83, 104, 193; in the tenth century al-Ḥijāz still depended on Egypt for grain. Caetani, vol. IV, 21 A.H., secs. 136-40. *Greek Papyri in B.M.*, vol. IV, introd. *loc. cit.*, also nos. 1346, 1465; cf. vol. III. no. 1162. Butler, pp. 345-48, 372, 389-98 (the Pharos). P. Kahle, "Zur Geschichte des mittelalterlichen Alexandria," in *Der Islam*, vol. XII, 1922. On the canal: Posener, *op. cit.* in *Chronique d'Egypte* (1938).

south enjoyed almost unbroken peace for two and a half centuries (618-868).

Our knowledge of the earlier Persian voyages comes from Chinese sources, which refer to the ships of the *Po-sse*. These people have been identified (though not beyond dispute) as Persians, i.e. Zoroastrians, speaking Persian—Arabic-speaking Moslems of Iranian origin would naturally be classed as *Ta-shih*, Arabs.[57] Zoroastrians, known to the Arabs as *Majūs* or Magians, formed the majority of the inhabitants of Iran for long after the Moslem conquest, just as Christians did in Egypt and other countries. The Arab conquerors would be inclined to leave in their hands the inferior profession of navigation.

The first mention is in 671, when the Chinese pilgrim I-ching embarked on a *Po-sse* ship at Canton and sailed south to Bhoga (Palembang?) in Southeast Sumatra. In 717 an Indian sailed from Ceylon to Palembang in a convoy of thirty-five *Po-sse* ships; most of them were wrecked. Eventually the Indian arrived in Canton, in 720—whether with *Po-sse* or not is not clear. A Chinese account of the *Po-sse* in 727, after describing their voyages to Ceylon and Malaya, says, "They also sail in big craft to the country of Han [China], straight to Canton for silk piece goods and the like ware."

A very large village of *Po-sse* is found in the island of Hainan in 748, and in the same year they are mentioned along with Brahmans and Malayans as owners of vessels on the river at Canton.[58] Under the year 758 the *History of the*

[57] Identity of the *Po-sse*: Ḥasan, *Persian Navigation*, pp. 97 ff.; B. Laufer, *Sino-Iranica* (Chicago, 1919). Unfortunately the term was also used for a Malayan people; but I follow Ḥasan in assuming that in all cases mentioned here the *Po-sse* are the Persians.

[58] I-ching's Travels, vol. II, p. 5a, Eng. tr. J. Takakusu, *A Record of the Buddhist Religion* (Oxford, 1896), p. xxviii. Yuan-chao, *Cheng-yuen*, bk. XXVIII, pt. VI, ch. 14, pp. 77-78, Fr. tr. S. Lévi in *J.As.* (May-June 1900), p. 418, Hwi-Chao, text and Eng. tr. F. Hirth in *Journal of the American Oriental Society*, vol. XXXIII (1913), p. 205 (quoted). Kien Chen, see J. Takakusu in *First Congress*

T'ang has the following significant sentence, "The *Ta-shih* and *Po-sse* together sacked and burned the city of Kwang-chou [Canton] and went back by sea." This daring and ungracious act was perhaps made possible by the weakness of the Chinese imperial forces in Canton, for at that time the Son of Heaven was fully engaged in North China in suppressing the terrible Turkish rebel An Lu-shan. Even so, the sack proves that there were considerable numbers of these foreign traders then in Canton. This is the last mention of the *Po-sse* in Chinese annals. At the same time the *Ta-shih* make their appearance by their side as a foreign community.[59]

There is little evidence from the Arabic side of when or how the Arabs first came to China. The conquest of al-Sind by al-Ḥajjāj, soon after 710, gave the Arabs the valuable ports of al-Daybul and al-Manṣūrah, and thus brought them a stage nearer to the Far East. Before the end of the Umayyad caliphate (749) some Shī'ah Moslems, fleeing from persecution in Khurāsān, had settled on an island in one of the large rivers of China, opposite a port. Such is the tradition preserved by al-Marwazi (c. 1120), who describes the community as still in existence at some later date and acting as middlemen in the trade between Chinese and foreigners. Late writings of the Ibādite sect also record on good authority the voyage of an Ibādite merchant to China towards the middle of the eighth century: he was called Abu-'Ubaydah and was of 'Umāni origin; in China he bought aloes wood.[60]

---

of Far Eastern Studies (Hanoi, 1903), p. 58, and H. Yule, *Cathay and the Way Thither*, rev. ed. (London, 1915), vol. I, p. 100. Abstract of a diary given by Takakusu, quoted by Ḥasan, pp. 101-2, and Laufer, pp. 469-70.

[59] *Old History of the T'ang*, ch. 258b (quoted), Eng. tr. in Ḥasan, p. 99.

[60] On al-Sind: Balādhuri, pp. 435-36, 444-46; Mas'ūdi, Kitāb al-Tanbīh w-al-Ishrāf, p. 55; Ṭabari, pt. III, vol. I, pp. 359, 370, 460-61, 476-77. On Shī'ah refugees in China: Marwazi, ed. Minorsky, ch. 8, sec. 16. On Ibādite merchant: T. Lewicki, "Les premiers commerçants arabes en Chine," in *Rocznik Orientalistyczny*, vol. XI (1935), pp. 173-86. See too J. Kuwabara, "On P'u Shou-kêng," in *Memoirs of the Research Department of the Toyo Bunko*, no. 2 (1928), pp. 1-79.

The accession of the 'Abbāsid dynasty to the caliphate brought a new impetus to sea trade to and from the Persian Gulf, owing to the removal of the capital from Damascus to Baghdād. According to the geographer al-Ya'qūbi, al-Manṣūr was well aware of the economic advantages of the site of Baghdād, and he puts into his mouth these words: "It is an 'Island' [*Jazīrah*] between the Tigris and Euphrates . . . and a water-front for the world. Everything that comes on the Tigris from Wāsiṭ, al-Baṣrah, al-Ahwāz, Fāris, 'Umān, al-Yamāmah, al-Baḥrayn and the neighboring places, can go up to it and anchor at it. In the same way whatever is carried on boats on the Tigris from Mosul, Diyār Rabī'ah, Azerbaijan and Armenia, and whatever is carried on boats on the Euphrates from Diyār Muḍar, al-Raqqah, Syria, the Frontier, Egypt and North Africa [*al-Maghrib*], can come to this terminus and unload here. It can also be a meeting-place for the people of the Mountain [*al-Jibāl*] and Iṣfahān and Kūr and Khurāsān."

The Euphrates was connected with the Tigris by several navigable canals, of which the Nahr 'Īsa terminated at Baghdād. The new capital was in the center of the rich plains of Mesopotamia, far better irrigated and more populous than they are today. Baghdād grew rapidly to the position of a new Babylon, a vast center of population, wealth, and luxury; consequently it became the commercial metropolis of the Middle East. This was bound to stimulate the traffic from the Persian Gulf ports to the Far East. Al-Ubullah and Sīrāf were the chief ports for seagoing ships, but river craft could carry the cargoes right up to Baghdād. As al-Ṭabari makes al-Manṣūr say, "This is the Tigris; there is no obstacle between us and China; everything on the sea can come to us on it."[61]

[61] Ya'qūbi, *Kitāb al-Buldān*, pp. 237 (quoted), 250; Ṭabari, vol. I, p. 272 (quoted). On Mesopotamia: G. le Strange, *The Lands of the Eastern Caliphate* (Cambridge, 1905).

The 'Abbāsid caliphs also encouraged the fusion of their Arab and Persian subjects into a Moslem unity, speaking Arabic. Thus when we come to the ninth century Arabic records of sea trade with the Far East, we find mention of Moslems and Arabs far more than of Persians. This change must have come about quite gradually. Of course there had always been Arabians sailing from the Persian Gulf ports, as has been seen; but the number of "Arabs" was now greatly increased by the conversion of Iranians to Islam and their adoption of the Arabic language at least for the purposes of religion, literature, official business and commerce. Yet the Persians left many traces on the maritime life of the times. Many words of Persian origin are found in the nautical vocabulary of the medieval Arabs. Such are:

balanj: cabin.

bandar: port; found in many names used by the Arabs, e.g. Barr al-banādir in E. Africa round the Equator; Bandar al-Kayrān, Bandar Nus, Bandar Raysūt and others round the coasts of Arabia. A glance at the index of a modern atlas will show how many *Bandars* survive today all round the Indian Ocean.

daftar: sailing-instructions.

dūnīj: ship's boat.

dīdbān: look-out boy.

khann: point of the compass; together with the names of some of the points of the compass.

nākhuda or *nākhudha*: pl. *nawākhid*, etc., shipmaster, from Pers. *nau khoda.*

rahmāni: book of nautical instructions, from Pers. *rahnāmeh.*

sanbūq: a type of sailing ship.

The names of many of the captains mentioned in Buzurg's *Kitāb 'Ajā'ib al-Hind* (see below p. 68) are Persian—as might be expected, since Buzurg was an Iranian and col-

lected many of his stories from the captains of the Iranian port of Sīrāf. Finally, even the Chinese knew the Arabs as *Ta-shih*, which comes from Persian *Ta-zik*, "a man of the Tayy tribe."[62]

The foundation of Baghdād did not immediately produce any increase in the trade with China. The city took years to build and to turn into a commercial center. At the other end of the route the sack of Canton led to the prohibition of foreign merchants from the city for a long period; during this period Tongking was the terminus for foreign ships. Canton was reopened in 792, according to a Chinese source. Thereafter we have some slight evidence of intercourse. Another Ibādite merchant, al-Naẓar ibn-Maymūn of al-Baṣrah, is on the record as visiting China. Chinese annals contain an interesting fragment written by Kia Tan toward the end of the eighth century, describing the route from Canton to Baghdād; but Kia Tan says nothing about the nationality of the ships making the voyage. Perhaps it is to this period, too, that we must date the story in Buzurg of a famous captain called 'Abharah, who was the first to make regular voyages to China. In 825 a large naval force was sent from al-Basrah to punish the pirates of al-Baḥrayn who were raiding ships coming from Iran, India and China.[63]

By the middle of the ninth century it is certain that there was regular sailing to China, and we have two independent accounts of the route at this time, written by ibn-Khurdādhbih and the author of the *Akhbār al-Ṣīn w-al-Hind*. Arabic sources from now on are more substantial, and before the narrative is resumed it would be useful to give an account

[62] G. Ferrand, "L'element persan dans les textes nautiques arabes," in *J.As.*, vol. ccIV (April-June 1924), pp. 193-257.

[63] On Canton and Tongking: P. Pelliot, "Deux itineraires de Chine en Inde à la fin du VIIIe siècle," in *Bulletin de l'École Française d'Extrême-Orient*, vol. IV (1904), pp. 131-413. Lewicki, *op. cit.* Kia Tan, in *New History of the T'ang*, ch. 43b, Eng. tr. F. Hirth and W. Rockhill, *Chau Ju-Kua* (St. Petersburg, 1911). Buzurg, pp. 85 ff., translated in Appendix to Chapter III. Barhebraeus, *Chronography*, ed. and Eng. tr. E. A. W. Budge (Oxford, 1932, 2 vols.), pp. 142-43.

of them. We can make a rough and somewhat arbitrary division of the writers into two classes, geographers and travel writers.

By the geographers are meant those who wrote systematic accounts of the lands of Islam and beyond. These provide valuable information about the harbors and coasts of the Indian Ocean. Ibn-Khurdādhbih in his book of routes written around 850 describes the stages of the voyage from the Persian Gulf to China. Al-Mas'ūdi, whose *Murūj al-Dhahab wa Ma'ādin al-Jawhar*.(c. 947) may be classed with works of geography, though it contains much else besides, takes a conscious pride in his interest in the sea, seamen, and their language. He gives much geographical and other information, some of which is based on surviving and vanished earlier authorities, some on his personal experience. This author had sailed to India and East Africa. His *Kitāb al-Tanbīh w-al-Ishrāf* (c. 955) is of less interest for our subject. Al-Maqdisi, who wrote in 985/986, relates his own experiences in sailing round the Arabian coasts. In the intervals between these three, other geographers supply knowledge of locations and other details to fill in the picture: al-Ya'qūbi (writing 891/892), ibn-al-Faqih, ibn-Rustah (both c. 903), al-Iṣṭakhri (c. 950) and ibn-Hawqal (soon after). These all wrote the same kind of geographical handbook, using each others' work freely. Finally al-Marwazi, in a compilation which he wrote perhaps c. 1120, preserves some interesting details concerning earlier periods.[64]

[64] The principal works of the Arab geographers are collected in the series *Bibliotheca Geographorum Arabicorum*, ed. M. J. de Goeje (Leyden, 1879 sqq.), as follows: (i) Iṣṭakhri, *Kitāb Masālik al-Mamālik*. (ii) Ibn-Ḥawqal, *Kitāb Ṣūrat al-Ard*, 2nd. ed. J. H. Kramers. (iii) Maqdisi, *Aḥsan al-Taqāsīm fi Ma'rifat al-Aqālīm*, 2nd ed. M. J. de Goeje (1906). (iv) Index and glossary to vols. I-III. (v) Ibn-al-Faqih, *Mukhtasar Kitāb al-Buldān*. (vi) Ibn-Khurdādhbih, *Kitāb al-Masālik w-al-Mamālik*. Qudāmah, *Kitāb al-Kharāj*. (vii) Ibn-Rustah, *Kitāb al-A'lāq al-Nafīsah*. Ya'qūbi, *Kitāb al-Buldān*. (viii) Mas'ūdi, *Kitāb al-Tanbīh w-al-Ishrāf*. Index and glossary to vols. VII and VIII.

Also Mas'ūdi, *Murūj al-Dhahab wa Ma'ādin al-Jawhar*, ed. and Fr. tr. C. B. de Meynard and P. de Courteille (Paris, 1861-77), 9 vols.; *Sharaf al-Zaman*

The travel writers are equally valuable. In 851 an unknown writer issued a collection of reports from merchants about the sea route from Sīrāf to Canton and the customs of the Indians and Chinese. This *Aḫbār al-Ṣīn w-al-Hind* has generally been attributed to a merchant Sulaymān whose name is mentioned in it, but without good reason, as Professor Sauvaget has shown recently. About 916 a citizen of Sīrāf, abu-Zayd al-Ḥasan ibn-al-Yazīd, commented on and supplemented the *Aḫbār* from information which he had gathered by talking to the merchants and seamen of Sīrāf. Of unique importance is the work entitled *Kitāb 'Aja'ib al-Hind* (*The Book of the Wonders of India*), mostly written soon after the middle of the tenth century but supplemented by a few later additions. Authorship is traditionally ascribed to a Persian, "Buzurg ibn-Shahriyār of Ramhurmuz," and I shall refer for convenience to "Buzurg." Whatever his real name, the author was himself a sea captain, and collected stories from other captains and merchants of Sīrāf, al-Baṣrah and 'Umān: tales of India, the Far East, and East Africa, above all tales of the sea. Amid the wonders and the tall stories, the matter-of-fact details seem genuine enough, and the work offers a close glimpse of life at sea in that age. The author has a gift for narrative, and his book may be counted a worthy forerunner of the Sindbad stories in the *Arabian Nights*. A translation of three of Buzurg's tales is given in the Appendix to Chapter III.[65]

Tahir Marvazi on China, the Turks and India, ed. V. Minorsky (London, 1942); Yāqūt, *Kitāb Mu'jam al-Buldān*, ed. F. Wüstenfeld (Leipzig, 1924), 6 vols. Interest in the sea: Mas'ūdi, *Murūj*, vol. I, pp. 282-83, 331-32, 340, 343-45; Maqdisi, pp. 10, 15.

[65] *Aḫbār aṣ-Ṣīn wa l-Hind - Relation de la Chine et de l'Inde*, ed. and Fr. tr. J. Sauvaget (Paris, 1948), with introduction and notes; supersedes all earlier editions. Abu-Zayd of Sīrāf, Supplement to *Akhbār*, ed. de Feu Langles, with Fr. tr. and introd. J. T. Reinaud, in *Relation des voyages faits par les Arabes et les Persans dans l'Inde et la Chine*, etc. (Paris, 1845). Buzurg, *Kitāb 'Aja'ib al-Hind*, in *Le livre des merveilles de l'Inde*, ed. P. van der Lith with Fr. tr. L. M. Devic (Leyden, 1883-86). Most of Buzurg's stories date from the first half of the tenth century, but one is dated 390 A.H., i.e. A.D. 1000. G. Ferrand, *Relations de voyages*

From the descriptions of ibn-Khurdādhbih, the writer of the *Akhbār*, and others slightly later, we can compose an account of the route to China in use in the middle of the ninth century.

The western termini for the China ships were al-Baṣrah and al-Ubullah and Sīrāf. Old al-Baṣrah on its canal was the Manchester of lower Mesopotamia, but al-Ubullah was its Liverpool. Although al-Baṣrah was a great commercial center, it seems that large seagoing ships could not come up to it but docked in al-Ubullah. Al-Baṣrah was a new foundation of the Arabs, while al-Ubullah was the old Apologus, which had been refounded by Khusraw Ardashir and survived into Moslem times. Al-Ubullah was at the mouth of the canal on the Tigris; but entrance into the canal was dangerous because of a large whirlpool. Al-Ubullah also had shipyards. At the mouth of the river which then entered the sea near 'Abbādān, there were treacherous shallows on which ships were often wrecked. To keep ships off these shallows, three wooden scaffolds (*khashabāt*) were erected in the sea, supporting watch towers; beacons were lit on them at night, to serve the purpose of a lighthouse. The towers also served as signal-stations, on which a lookout was kept for pirates from the Persian Gulf and even India (see below p. 70).[66]

The difficulties of navigation in these headwaters of the Persian Gulf contributed to the growth of Sīrāf, on the coast of Iran south of Shīrāz. This town was on a hot and barren shore, like Aden, and lived on supplies brought by sea; its existence was entirely due to its sea commerce, but this was

---

et textes geographiques arabes, persans et turks relatifs à l'Extrême Orient du VIII au XVIII siècles (Paris, 1913-14), 2 vols.

[66] *Akhbār*, secs. 11-16 in Sauvaget; ibn-Khurdādhbih, pp. 60-69. On al-Baṣrah and al-Ubullah: Le Strange, *Eastern Caliphate*, pp. 43 ff.; Ya'qūbi, *Buldān*, p. 310; Iṣṭakhri, p. 81; Nāsir-i-khusraw, *Sefer Nameh*, ed. and Fr. tr. C. Schefer (Paris, 1881), pp. 243-44. On the *khashabāt*: Kia Tan (end of eighth century), in *New History of the T'ang*, ch. 43b, Eng. tr. F. Hirth and W. Rockhill, *Chau Ju-Kua* (St. Petersburg, 1911), p. 13; Iṣṭakhri, pp. 32, 33; Mas'ūdi, *Murūj*, vol. 1, pp. 229-30; Maqdisi, p. 17; Nāsir-i-khusraw, pp. 244-47.

so flourishing as to make Sīrāf the rival of al-Baṣrah in wealth. The geographers describe the extravagant residences of its merchants and shipowners, built in stories of teak wood imported from India and other woods from East Africa. *Aḫbār* reports that cargoes were generally brought in smaller vessels from al-Baṣrah and other ports of the Gulf to Sīrāf and there transferred to the large China boats. Exports to the Far East probably consisted of costly fabrics of linen, cotton or wool, including rugs; metal-work, iron-ore and bullion.[67]

In sailing down the Persian Gulf, one had to beware of pirates from al-Baḥrayn, Qaṭar and the Iranian coast, as well as of various reefs in the sea. Ships could take two routes to India. They could call at Ṣuḥār and Masqaṭ, busy ports on the coast of 'Umān; then, taking a good supply of water, they could sail straight across the Indian Ocean for Kūlam Malī (Quilon) in Southern Malabar. This is the route described by *Aḫbār*; it would naturally be taken by ships on the long China run. Or they could make a coasting voyage, calling at Qays Island, old Hurmuz, Tīz in Makrān, al-Daybul, al-Manṣūrah or other ports of al-Sind. After al-Sind, precautions would have to be taken against the Mayd, the Kurk and other notorious pirates of the Gulfs of Cutch and Kathiawar. These pirates in their *bawārij* raided widely over the Indian Ocean, even occasionally as far as the mouth of the Tigris and the southern part of the Red Sea and the coasts of Ceylon; Socotra was one of their lairs. For defense against them, merchant ships had to carry marines trained to throw Greek fire.[68]

---

[67] On Sīrāf: Iṣṭakhri, pp. 34, 127; Maqdisi, pp. 426-27; *Aḫbār*, sec. 13. On exports: P. Hitti, *History of the Arabs* (2nd ed., London, 1940), pp. 345-49; A. Mez, *Die Renaissance des Islams* (Heidelberg, 1922).

[68] On Persian Gulf pirates: ibn-Khurdādhbih, p. 60; Barhebraeus, pp. 142-43; Iṣṭakhri, pp. 33, 140-41. On reefs: *Aḫbār*, sec. 13; Mas'ūdi, *Murūj*, vol. I, pp. 240-41, Maqdisi, p. 12. On routes to India: (1) *Aḫbār*, secs. 13-14; (2) ibn-Khurdādhbih, pp. 61-64. On the *bawārij*: Balādhuri, p. 435; Mas'ūdi, *Murūj*,

After leaving al-Sind, the coasting vessels were out of Moslem waters. Little information is to be had about the ports of the Bombay and Malabar coasts, beyond the bare names which are hard to identify. But certainly Malabar had economic importance to the Moslems, as the source of that teak wood with which not only the houses of Sīrāf but also ships were built. The Maldive and Laccadive Islands also provided shipbuilding materials from the coconut tree (see Chapter III, p. 91).

From Kūlam Malī or another Malabar port, called by ibn-Khurdādhbih Bullīn, a passage might be made to Ceylon, the Island of Rubies, known to the Arabs as Sarandīb. Or a coasting voyage might be made by small ships through the Palk Strait and round the shores of the Bay of Bengal; here again ibn-Khurdādhbih's account is little more than names. A third alternative was the route to China; after paying tolls of 1,000 dirhams at Kūlam Malī, the China ships would skirt the south of Ceylon and set their course almost due east to the Nicobar Islands, where they would take water and barter with the natives who used to come out in canoes. The next port was Kalah Bār, probably at the modern Kedah in Malaya, which became more important in the tenth century under changed conditions. From there some sailed to Sumatra and Java, but we hear more of the voyages to China.

After the passage through the Malacca Strait, known to the Arabs by its Malay name of Salāht ("Strait"), a call was made at Tiuman Island. Next cutting across to Indo-China, they stopped at ports in Ṣanf, the Champa kingdom in the eastern coastal plain, then at an island off the coast, known as Ṣanf Fūlāw (corrupted in our texts to "Ṣandar Fūlāt"). From there vessels might coast round the Gulf of Tongking

---

vol. III, pp. 36-37, *Tanbīh*, p. 55; Maqdisi, pp. 12, 14; Ṭabari, pt. III, vol. I, pp. 359, 370, vol. III, p. 1582; Bīrūni, *India*, Eng. tr. E. C. Sachau (London, 1910, 2 vols.), p. 102. *A History of the Imams and Sayyids of Oman*, ed. G. P. Badger (London, 1871, Hakluyt Society vol. XLIV), pp. 12-13.

to Hanoi, known as Lūqīn, before they made for their final destination, Canton, which was called Khānfu. Others made across the open sea, through the Paracel Reefs, which were known as the Gates of China, to Canton. The South China Sea had the reputation of being particularly dangerous by reason of reefs and typhoons; so it is not clear why seamen did not avoid the Paracel Reefs, unless they thought that by taking a more westerly course they would incur the still worse risk of being dashed on the Chinese coast by a typhoon.

The coast to the north of Canton was not unknown to the Arabs; ibn-Khurdādhbih mentions the ports of Khānju (Chu'an-Chow-Fu) and Qānṭu or Qānṣu (Hangchow), implying but not stating that Moslems sailed to these ports. It is certain that some Moslems went as far as Korea (al-Shīla or al-Sīla), either by land or by sea.[69]

But Khānfu was the greatest emporium, and there was a very large colony of western traders, Moslems and others, living there (see below pp. 76-77). The Moslems had received from the Emperor the concession of referring legal disputes among themselves to a *qāḍi* of their own community. Trade was closely regulated by the Chinese government. *Akhbār* describes the procedure for the control of imports: "When the seamen come in from the sea, the Chinese seize their goods and put them in the [customs] sheds; there they guard them securely for [anything up to] six months, until the last seaman has come in. After that, three tenths of every consignment is taken as a duty, and the remainder is delivered to the merchants. Whatever the Government requires, it takes at the highest price and pays for promptly and fairly."

[69] *Akhbār*, secs. 4, 6-7, 14-16, with notes of Sauvaget; ibn-Khurdādhbih, pp. 62-69. On Southern India: S. M. H. Nainar, *Arab Geographers' Knowledge of Southern India* (Madras, 1942). On Ceylon: N. Ahmad, "The Arabs' Knowledge of Ceylon," in *Islamic Culture*, vol. XIX (July, 1945). On Korea: K. W. Chung and G. F. Hourani, "Arab Geographers on Korea," in *Journal of the American Oriental Society* (December 1938). M. Hartmann, "China," in *Encyclopaedia of Islam* (Leyden, 1936).

The purpose of holding all goods until the end of the inward sailing season (summer, see below) may have been to ensure a fair market for all, as al-Marwazi says; it may also have been to bring down prices, by producing a glut and leaving little time for sale to those merchants who wished to sail west with the opposite monsoon. Since we are also told that goods were often destroyed by fire in the city's wooden buildings, we can imagine that the foreign merchant was hard put to it to make a profit. Then there were further controls before the outward voyage. There was a Chinese Inspector of Maritime Trade, at whose office foreign captains were required to register, who inspected the manifests, collected export duty and freight charges, and forbade the export of scheduled rare and precious articles.[70]

Cargoes of silk fabrics, camphor, musk, and spices were loaded. Having fulfilled or evaded all formalities, the large western ships sailed slowly down the widening bay, passing hundreds of craft of every shape and size from all parts of Asia. The return voyage followed the same route as the outward, as far as Kūlam Malī. From there captains used to make first for Raysūt or some other point on the Shiḥr or Mahrah coast. Then they would make east along the shore, until they turned into the Gulf of 'Umān. At last they would let down anchors at Sīrāf or al-Ubullah, thankful to God for having preserved them from all perils and enriched them with His gifts. The *nawākhid* would sell their cargoes and buy new ones; the captains would repair their hulls and prepare for the next voyage. Owners, captains and crews would relax in the cafes and tell tales, true and untrue, about the wonders they had seen. Out of these tales such books as the *Wonders of India* were compiled, and in the course of cen-

[70] *Akhbār*, secs. 12, 34. Marwazi, ch. 8, sec. 27 in Minorsky. *T'ang-Kuo-shi-pu*, paraphrased in Hirth and Rockhill, *Chau Ju-Kua*, introd., p. 9; no reference is given.

turies they were transmuted into the Sindbad stories well known in Europe and America.[71]

It is possible to work out the timetable of these voyages. According to al-Mas'ūdi, the season at which the Arabs generally sailed on the western part of the Indian Ocean was when the sun is in Sagittarius, i.e. the second half of November and the first half of December; scarcely any ships sailed in June. Again, *Aḫbār* gives the following times for the voyage to China:

Masqaṭ to Kūlam Malī	1 lunar month (29-30 days)
Kūlam to Kalah Bār	1 month
Kalah to Ṣanf Fūlāw	1 month
Ṣanf Fūlāw to Canton	1 month

This gives a total of 120 days' sailing time between Masqaṭ and Canton, excluding stops: so we must allow six months or more for the whole voyage from al-Baṣrah or Sīrāf, with the stops en route. If we combine these statements with the permanent facts of climate in the Eastern seas, we have enough for our purpose. The China ships would sail down the Persian Gulf before it gets at all rough, in September or October. They would cross from Masqaṭ to Malabar with the northeast monsoon, just as they do today. This was a month's voyage, and we may put it in November-December, following al-Mas'ūdi. The last two weeks of December could be spent trading at Kūlam Malī, for in any case no further progress could be made until the cyclones in the southern part of the Bay of Bengal came to an end, toward the close of December. A month of sailing to Kalah Bār would cover January. After a few weeks at Kalah, toward the end of the northeast monsoon, a ship might have a following wind through the Malacca Strait, and be in time to use the south-

[71] Ya'qūbi, *Buldān*, p. 365; Buzurg, pp. 90-92, 129-30; *Aḫbār*, sec. 11. H. Fawzi, *Ḥadīth al-Sindabād al-Qadīm* (Cairo, 1943), traces the evolution of the Sindbad stories. Al-Ṣūli, *Kitāb al-Awrāq*, ed. J. Heyworth-Dunne (London, 1934 sqq.), vol. II, p. 6, mentions Sindbad stories in circulation in A.D. 934.

ern monsoon in the Sea of China. This is the summer monsoon, and in that sea it is gentler than the northeast of winter; in April and May it is light, and typhoons are of least frequency then.

After a summer at Canton, one would return with the northeast monsoon to the Malacca Strait between October and December, and again cross the Bay of Bengal in January, from Kūlam to Raysūt in February or March, still with the northeast. But from Raysūt one might well attain Masqaṭ with the first gentle breeze of the southwest in April, and end the voyage once more in a smooth summer Gulf. Thus the round trip took a year and a half, leaving a summer at home before the next trip.[72]

It is unlikely that Chinese ships were visiting western ports at this time. Had they done so, it is probable that they would have received some description from Arab writers. It is true that the geographers and travelers speak of *marākib al-Ṣīn*, "ships of China," and *sufun Ṣīnīyah*, "Chinese ships," but in some cases at least the context shows that western ships are meant. Thus these expressions can mean "ships in the China trade," a usage for which there are many parallels in other languages, "China clippers," "East Indiamen," "ships of Tarshish," etc. There is, however, one passage of al-Mas'ūdi which does seem to say that Chinese ships used to sail to the West. Speaking of Kalah in the tenth century, al-Mas'ūdi writes, "At this place Moslem ships of the Sīrāfis and 'Umānis stop at the present time [before 947], and meet the ships that have come from China. But in earlier days it was otherwise: the ships of China [*marākib al-Ṣīn*] used to come to the land of 'Umān and Sīrāf and the coast of Persia and the

[72] Mas'ūdi, *Murūj*, vol. I, pp. 325-27; *Akhbār*, secs. 11-16. In sec. 11 *Akhbār* says returning ships are sometimes blown onto al-Yaman; which proves, if proof is needed, that they crossed from India with the northeast monsoon. See Parkinson, *Trade in the Eastern Seas*, ch. 4, on the use of Indian Ocean winds by British East Indiamen; Clemesha, *op. cit.*, in *Journal of the Polynesian Society*, vol. LII (1943).

coast of al-Baḥrayn and al-Ubullah and al-Baṣrah, and conversely ships used to go from the places mentioned to China." This passage may be left for the reader to judge. Even if it means that Chinese junks used to sail to the Persian Gulf, the passage stands unsupported by any other clear evidence, before at least the end of the twelfth century. Al-Mas'ūdi may be mistaken, writing in 947 about a time before 878 (see below p. 77, for this date). Hirth and Rockhill say, "The so called 'Chinese ships' may have been built in China, but it seems highly improbable that they were owned or navigated by Chinese."[73]

What was the volume of the Moslem traffic with South China? On this question we have two seemingly contradictory traditions. According to *Akhbār* in 851, "The goods of China are rare [in Persia and Mesopotamia]; and among the causes of their rarity is the frequent outbreak of fires at Khānfu, the port for ships and the *entrepôt* for the merchandise of the Arabs and the Chinese. . . . Another cause is that the ships are sometimes wrecked on the way out or on the way back, or plundered, or forced to make long stops and sell their goods in non-Arab countries. Sometimes, too, the wind throws them on to al-Yaman or other places and they sell their goods there; sometimes they make a long stop to repair their ships; and so on."

But abu-Zayd of Sīrāf, commenting on *Akhbār*, says that "sea-traffic at that time [851] was regular because of the great exchange of merchants between al-'Īrāq and those countries [India and China]." Moreover he asserts that in 878 no less than 120,000 Moslems, Christians, Jews, and Magians (i.e. Persians still unconverted to Islam) were mas-

[73] *marākib al-Ṣīn, sufun Ṣīnīyah*, etc.: Mas'ūdi, *Murūj*, vol. 1, p. 216 (pre-Islamic, see above, p. 47), p. 308 (quoted); Ya'qūbi, *Buldān*, p. 319; *Akhbār*, secs. 11-16; Buzurg, p. 85. Hirth and Rockhill, p. 15, note 3 (quoted). Kia Tan, *New T'ang Annals*, ch. 43b (Eng. tr. Hirth and Rockhill in *Chau-Ju-Kua*, introd., pp. 12-14), describes the route from Ceylon to Mesopotamia, but this does not prove that Chinese ships were making the voyage.

sacred in the disturbances of that year (see below). The exact number is known, he says, because the Chinese kept a census of the foreign community for purposes of taxation. Even if this was the whole community, the number is large; even if it is an exaggeration it indicates emphatically an extensive sea commerce with the West. The contradiction between *Aḫbār* and abu-Zayd is more apparent than real. In the first place, the rarity of Chinese goods in the West would be relative to the abundance of goods from nearer markets. Secondly, the reasons mentioned for the rarity of those goods in the Persian Gulf area were their sale in al-Yaman or non-Arab countries, and their destruction by fire at Canton or by wreck or piracy on the sea; therefore the volume of Chinese goods bought in Canton was much greater than that which arrived at Sīrāf and al-Ubullah.[74]

This trade came to a violent end in 878 when the forces of the rebel Huang Ch'ao besieged and sacked Canton, massacring the enormous number of foreign traders mentioned above, besides many Chinese. Apparently some Arabs were still left, for after describing this act of barbarism abu-Zayd writes: "And they [the rebels] raised their hands to oppress the foreign merchants who had come to their country; and to these events was joined the rise of oppression and transgression in the treatment of the Arab shipmasters and captains. They imposed illegal burdens on the merchants and appropriated their wealth, and made lawful for themselves what had not been practised formerly in any of their dealings. Wherefore God Almighty removed every blessing from them, and the sea became inaccessible to them, and by the power of the blessed Creator who governs the world disaster reached [even] the captains and pilots in Sīrāf and 'Umān."

Apart from this calamity, the Arab and Chinese empires were now in a general state of decline which little favored their intercourse. The T'ang dynasty was tottering to its fall,

[74] *Aḫbār*, sec. 11 (quoted); abu-Zayd, p. 61 (quoted).

and never recovered from Huang Ch'ao's rebellion; after the dynasty came to its final end in 907 there was a period of confusion lasting until the beginning of the Sung in 960. The 'Abbāsid empire was being dismembered from 850 onward, and here too there was a bloody rebellion in the '70's, provided by the Zanj slaves in lower Mesopotamia. The Zanj sacked al-Ubullah and al-Baṣrah and cut off Baghdād from the Persian Gulf. In 871 Sind became independent of the caliphate, under Arab rulers it is true; while from 899 onward the Carmatians in Eastern Arabia were a thorn in the flesh of al-'Īrāq. Sīrāf was badly damaged by an earthquake in 977.

When the direct voyages to Canton ceased, Arabs and Chinese used to meet at Kalah on the west coast of the Malaccan peninsula, at that time part of an Indonesian empire. The Arabs were also sailing to Sumatra and Java in the tenth century. Even the voyages to China had not ceased completely, for Buzurg mentions a Jewish merchant of 'Umān going there in the second decade of the tenth century.[75]

It remains to notice that the Red Sea also sent its fleets to the Far East. Aden was the chief port from this direction; it is described as "the gateway to China." An interesting passage of ibn-Khurdādhbih describes the routes followed by Jewish merchants between France and the Far East in the ninth century. One was by sea to Antioch, across Northern Syria to the Euphrates, down the rivers to al-Ubullah, and then by sea as has been described. Another route was to land in Egypt at al-Faramā' (ancient Pelusium), cross the isthmus of Suez with pack animals, sail from al-Qulzum to al-Jār and Juddah, then on to India and China; probably they changed

[75] Abu-Zayd, pp. 62, 66-67 (quoted), 90; Mas'ūdi, *Murūj*, vol. 1, pp. 307-8; Buzurg, pp. 67-69, 90-92, 107-111 (Jewish merchants), 129-30. In the quotation from abu-Zayd, it appears to be stated that the misdeeds of the Chinese brought disaster not only on themselves but indirectly on Arab and Persian seamen in the Persian Gulf, whose trade with China was cut off. On the Zanj rebellion: T. Nöldeke, *Sketches from Eastern History*, Eng. tr. J. S. Black (London, 1892).

ships at Juddah. Except for the danger of Indian pirates from Socotra, we learn little about the voyages from Juddah and Aden to the Far East. This route must have risen in importance in the tenth century when Egypt was gradually replacing Mesopotamia as the center of population and wealth in the Islamic world. Writing in 985/986, soon after the Fātimid conquest of Egypt (969), al-Maqdisi declares: "Know further that Baghdād was once a magnificent city, but is now fast falling to ruin and decay, and has lost all its splendour. . . . Al-Fusṭāṭ of Miṣr in the present day is like Baghdād of old; I know of no city in Islam superior to it."[76]

EAST AFRICA AND THE COASTS OF ARABIA

It has already been shown that the Persians were active in the western waters of the Indian Ocean in late Sassanid times. For the early Moslem period we have no information beyond vague traditions of later date to the effect that 'Umānis emigrated to East Africa in flight from al-Ḥajjāj in 690, and Persians of Shīrāz and Sīrāf emigrated in the ninth and tenth centuries. We may assume that trade between the Persian Gulf and East Africa continued all through these times. At the close of the seventh century there were enough Zanj slaves to make a revolt in Mesopotamia, which shows that a slave trade from East Africa existed. The same can be said more emphatically about the great Zanj rebellion in the years following 868, which was one of the main causes of the decline of the 'Abbāsid empire. There are few Arabic sources in this direction before the tenth century. But at that time they reveal Persians still dominating the trade round the coasts of Arabia as far as Juddah, now the *entrepôt* for trade between Egypt to the north and the Indian Ocean. Abu-Zayd writes in about 916, "The ships of the people of Sīrāf, when

[76] Ibn-Khurdādhbih, pp. 153-54; Mas'ūdi, *Murūj*, vol. III, pp. 36-37; Maqdisi, pp. 14, 34, 36 (quoted), Eng. tr. G. S. A. Ranking and F. Azoo (Calcutta, 1897); Buzurg, pp. 96-97.

they come to this sea which is on the right of the Indian Ocean [i.e. West in a medieval map], and reach Juddah, stop there; and the merchandise in them that is destined for Egypt is transferred to the ships of al-Qulzum, since the passages of that sea are not easy to the ships of the Sīrāfis, because of its difficulty and the multitude of reefs sticking up in it."

Al-Iṣṭakhri in the middle of the tenth century says that the mainstay of Juddah's commerce is with Persia, while al-Maqdisi near the end of the century says that "the Persians are the ruling class and live in splendid palaces," and elsewhere, "many people actually call this part of the [Arabian] sea as far as the coast of al-Yaman by the general name of the sea of Fāris; while most of the shipbuilders and seafaring men are Persians." Naturally the Persians in time became Islamized and Arabized, here as elsewhere.[77]

In the tenth century the ships of Sīrāf and 'Umān were trading regularly with East Africa. We hear little about the route, and we do not know whether they coasted all the way to Aden and round the Somali coast, or cut across from Ra's Fartak to Cape Guardafui. The former route is more likely, because a call at the big port of Aden would be profitable, and the open sea was rendered perilous by Indian pirates from Socotra. Passing down the African coast, the Arabs came to the land of the Zanj in quest of slaves, ivory, ambergris. The furthest destinations were Sufālah in Mozambique and Qanbalu (Madagascar), as well as the land of "Wāqwāq." The identification of this Wāqwāq is a problem. It is well known that there were two Wāqwāqs, one in the

[77] *Imams and Sayyids of Oman*, p. 5; *History of Kilwah*, ed. S. A. Strong, in *J.R.A.S.* (1895), pp. 385-430; Ṭabari, pt. III, vol. III, p. 1835; Buzurg, pp. 93-94, 147; abu-Zayd, pp. 136-37 (quoted); Iṣṭakhri, p. 19; Maqdisi, pp. 18 and 79 (quoted), also 92, Persian masters in Ṣuḥār. L. Massignon, "Zandj," in *Enc. Islam*; Hasan, *Persian Navigation*, pp. 132 ff.; U. M. de Villard, "Note sulle influenze asiatiche nell' Africa orientale," in *Rivista degli Studi Orientali*, vol. XVII (July, 1938), pp. 303-49.

region of East Africa, the other in the Far East. Ferrand has identified the former with Madagascar, the latter with Sumatra; and in fact there was a connection between these two islands, for Sumatrans migrated to Madagascar in the early centuries of the Christian era and again in the tenth century.

Al-Mas'ūdi sailed to East Africa from 'Umān, making his last voyage in 917. He reports the sayings of seamen about the ocean in those parts: "They add that its waves are huge as the lofty mountains, and that they are 'blind waves'; meaning by that that they rise up like mountains and sink down like valleys; [and that?] the waves never break and there never appears on them any foam as at the breaking of the waves of the other seas. They also say that the waves are 'mad.' The people who sail on this sea are 'Umāni Arabs of the tribe of Azd; when they get into the middle of this sea and find themselves between waves of the kind we described which lift them up and lower them, they sing the following rhyme at their work:

بربرا و جفونى و موجك المجنون
جفونى وبربرا و موجك كما ترى

'Barbara and Jafūna, mad are thy waves,
Jafūna and Barbara, see their waves!'"

Buzurg narrates an adventurous trip to Sufālah in 923. A seaman called Ismā'īlawayh left 'Umān for Qanbalu in that year, but a tempest drove his ship on to Sufālah. This aroused fear in him and his crew, for the natives were cannibals. They were taken ashore, however, and made to stay and trade for several months. Finally they were allowed to return to their ship, and the king of those parts with seven companions accompanied them on a boat and went aboard. Then, in the words of Ismā'īlawayh, "When they were on the ship, I said to myself, 'This king would be worth 30 dinars in 'Umān in the market-place, and the seven [com-

panions] 160 dinars, and they have clothes worth 20 dinars; so that they would bring us at least 3000 dirhams, without any risk attached.' So I cried to the sailors, and they raised the sails and lifted the anchors." The king tried to escape, without success; he and his companions were put with 200 other captured slaves, and all were sold at 'Umān. Later the king was restored to his kingdom, and converted his subjects to Islam.[78]

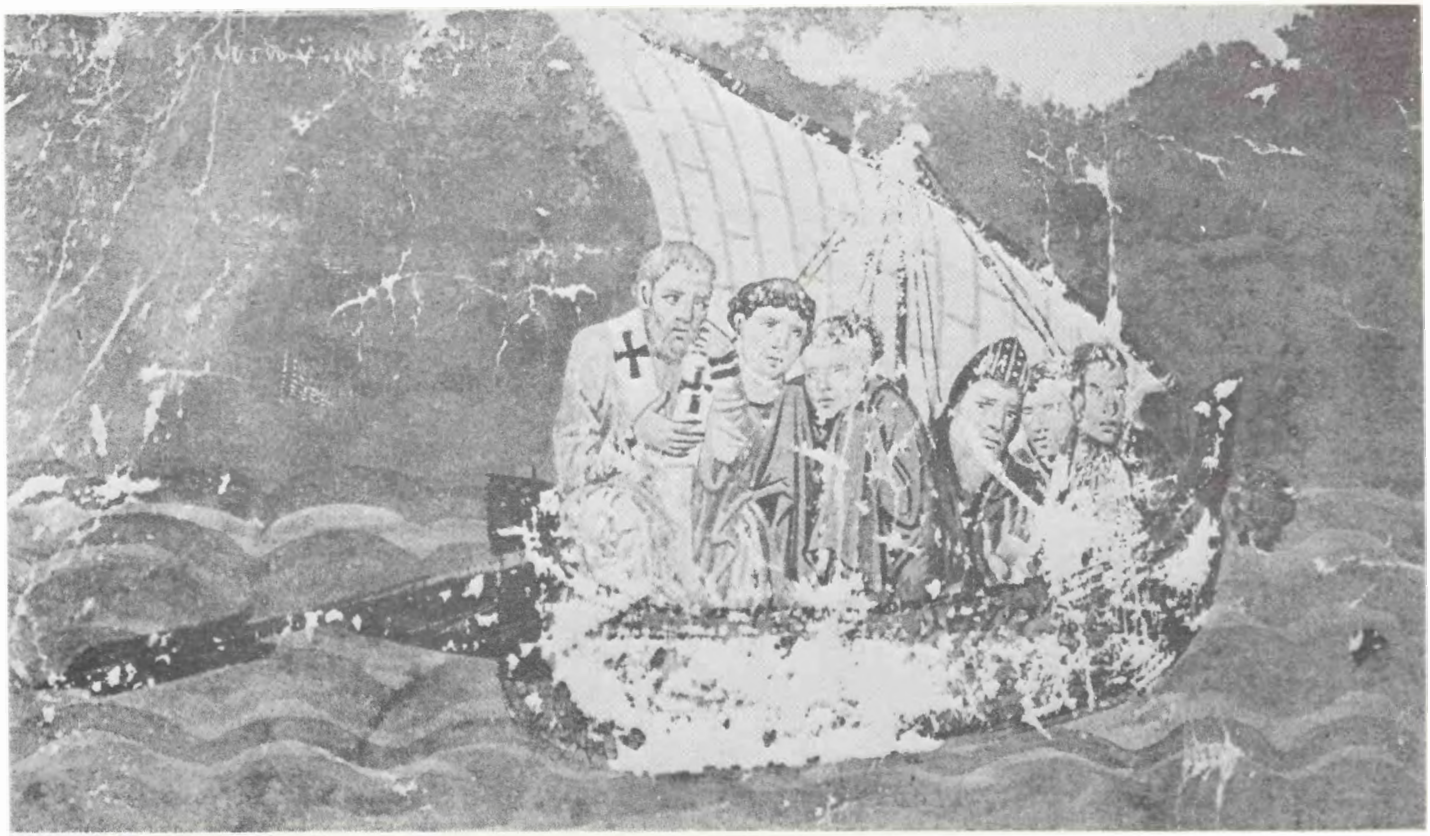
In the Red Sea, al-Jār and Juddah continued to import Egyptian grain for the Holy Cities from al-Qulzum. But the pilgrims preferred to travel overland, either through Western Arabia or up the Nile and across the desert to 'Aydhāb, then by sea to Juddah. They preferred to avoid as much as possible the dangers of the Red Sea, which is described by the Arab writers in just the same way as by the Greeks: it is full of coral reefs, its winds are violent, its shores barren and inhospitable; a skilled pilot is required, and it is necessary to anchor at night.

We are told that Hārūn al-Rashīd desired, like 'Amr ibn-al-'Ās, to cut a canal on the line of the present Suez Canal, but was dissuaded on the same ground: that this might enable Byzantine forces to go raiding against Mecca and al-Madīnah and kidnap pilgrims. These fears were not fantastic, for when the Crusaders in the twelfth century held Aylah on the Gulf of 'Aqabah, Renaud de Chatillon actually carried out such a raid from there, in 1183.[79]

[78] Ya'qūbi, p. 366; ibn-al-Faqīh, pp. 296-97; Iṣṭakhri, p. 25 (Aden); Mas'ūdi, *Murūj*, vol. I, pp. 205-6, 232-33 (quoted), vol. III, pp. 5-6, 34-35 (al-Yaman to Abyssinia); Maqdisi, pp. 34, 85; Buzurg, pp. 50-60 (quotation from 52), 60-61, 113-14, 175 (Wāq Wāq and Qanbalu). G. Ferrand, "Madagascar" and "Wāqwāq" in *Enc. Islam*, and "Le K'ouen-louen et les anciennes navigations interoceaniques dans les mers du Sud," in *J.As.* (1919). On Socotra: abu-Zayd, pp. 133-35; Mas'ūdi, *Murūj*, vol. III, pp. 36-37; Maqdisi, p. 14; there were still Christians, survivors of the Greek colonists; the Arabs believed they had been sent by Alexander on the advice of Aristotle.

[79] Ya'qūbi, pp. 313, 317, 335, 340-41; ibn-Rustah, p. 183; abu-Zayd, pp. 136-37; Iṣṭakhri, p. 30; Mas'ūdi, *Murūj*, vol. III, pp. 55-56, vol. IV, pp. 97-99 (Suez canal); Maqdisi, pp. 79, 83, 195-96, 215. A. Codazzi, "Il compendio geografico

5. Two Byzantine Lateen-rigged Vessels. From a Greek manuscript in the Bibliothèque Nationale, Paris (*MS. grec* 510, fol. 3), dating from c. A.D. 880. In the upper vessel, it is clear that the fore-part of the sail is pointed, without the luff which is found in the sails of the Indian Ocean. This final evolution of the lateen is therefore probably of Mediterranean origin. The main seams of the sail cloth are vertical, as in modern Arab lateens—presumably to lessen the risk of tearing. See R. L. Bowen, *Arab Dhows of Eastern Arabia* (Rehoboth, Mass., 1949), p. 30. Photograph by the Bibliothèque Nationale.



6. Another Byzantine Lateen-rigged Vessel. Fol. 367v of the same MS. as Plate 5. The same features appear, also a starboard rudder. Photograph by the Bibliothèque Nationale.

LATER TIMES

In these two chapters I have endeavored to survey the use of the sea routes of the Indian Ocean by the Arabs and neighboring peoples. Thus far, the history of the Arabs on this Ocean is one of an expanding commerce, which reached its peak in the ninth century of the Christian era. The tenth century supplies fairly extensive information on the subject of navigation, and so it has been included in this survey. But after the tenth century, both the sources are few and far between, and what they show is merely continuation along established lines. I shall make no attempt to carry this history further, but shall only indicate in a few sentences some of the principal events of later times.

The Arabs continued to sail to India, the East Indies and East Africa. But when ibn-Baṭṭūtah in the fourteenth century visited China, he noticed that the voyage from Calicut and other Malabar ports to China was made only in Chinese junks. At the end of the fifteenth century, the famous pilot Shihāb al-Dīn Aḥmad ibn-Mājid composed an excellent *rahmāni* (nautical directory) based on his own experience as well as on previous books; in this it appears that he is less familiar with Indonesia than with India. Yet up to this time it can be said that the Arabs remained the leading traders and mariners of the Indian Ocean.

This lead was broken by the entry of the Portuguese into eastern waters. In 1498 Vasco da Gama was at Malindi in East Africa looking for a pilot to take him to India. There he found none other than this Aḥmad ibn-Mājid, and persuaded him to conduct the Portuguese squadron across the ocean to Calicut. Thus, by one of the ironies of history, a great Arab seaman helped to bring about the undoing of

---

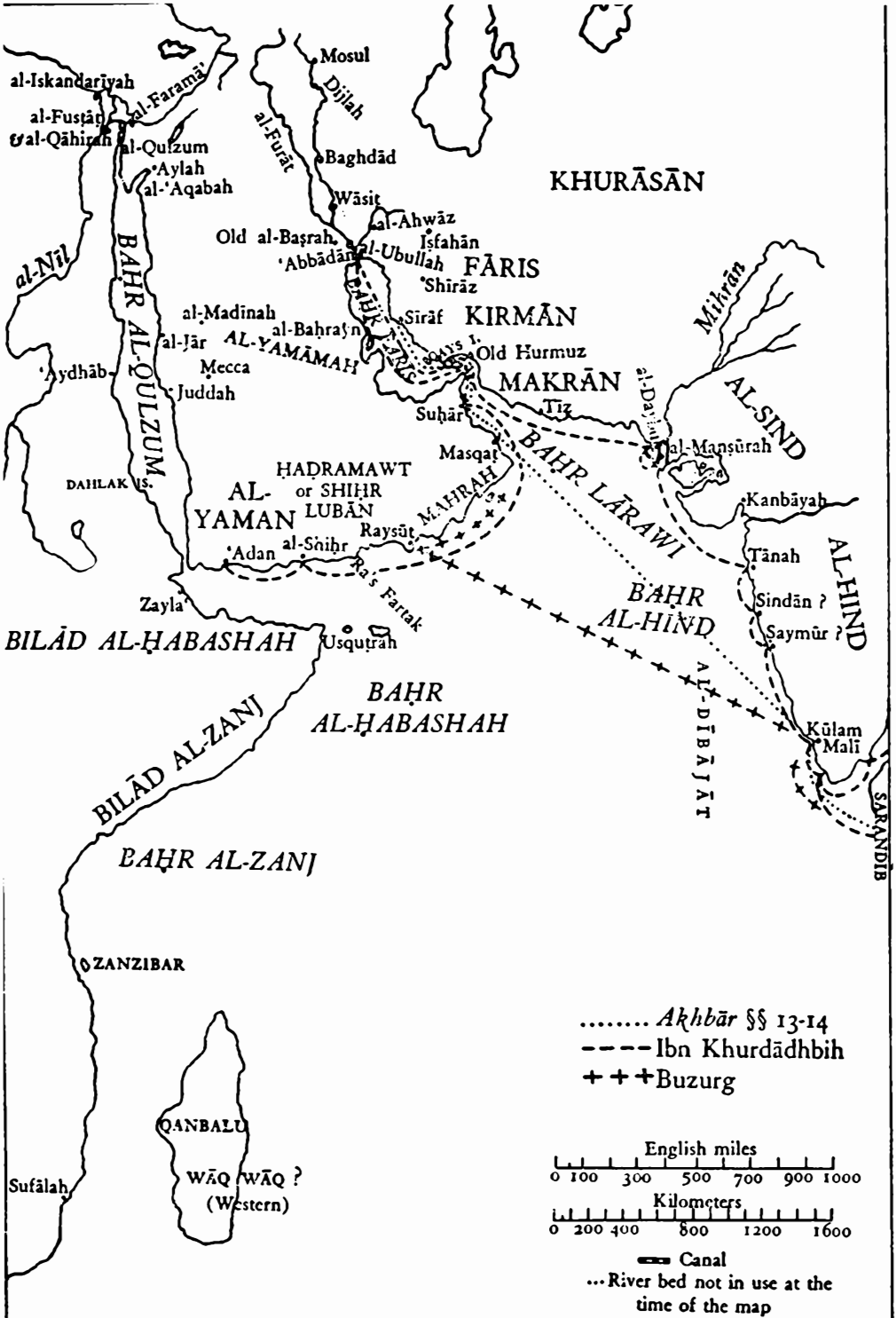
arabo di Isḥāq b. al-Ḥusayn," in *Rend. Acc. Lincia* (1929): fol. 21a mentions ships from India at al-Qulzum, prob. end of tenth century. On Renaud: D. Newbold, "The Crusaders in the Red Sea and the Sudan," in *Sudan Notes and Records*, vol. XXII, pt. II (1945), reprinted in *Antiquity*, vol. XX (1946).

Arab navigation, for the Arabs could neither drive out nor compete with the Portuguese and the other European nations which followed them.

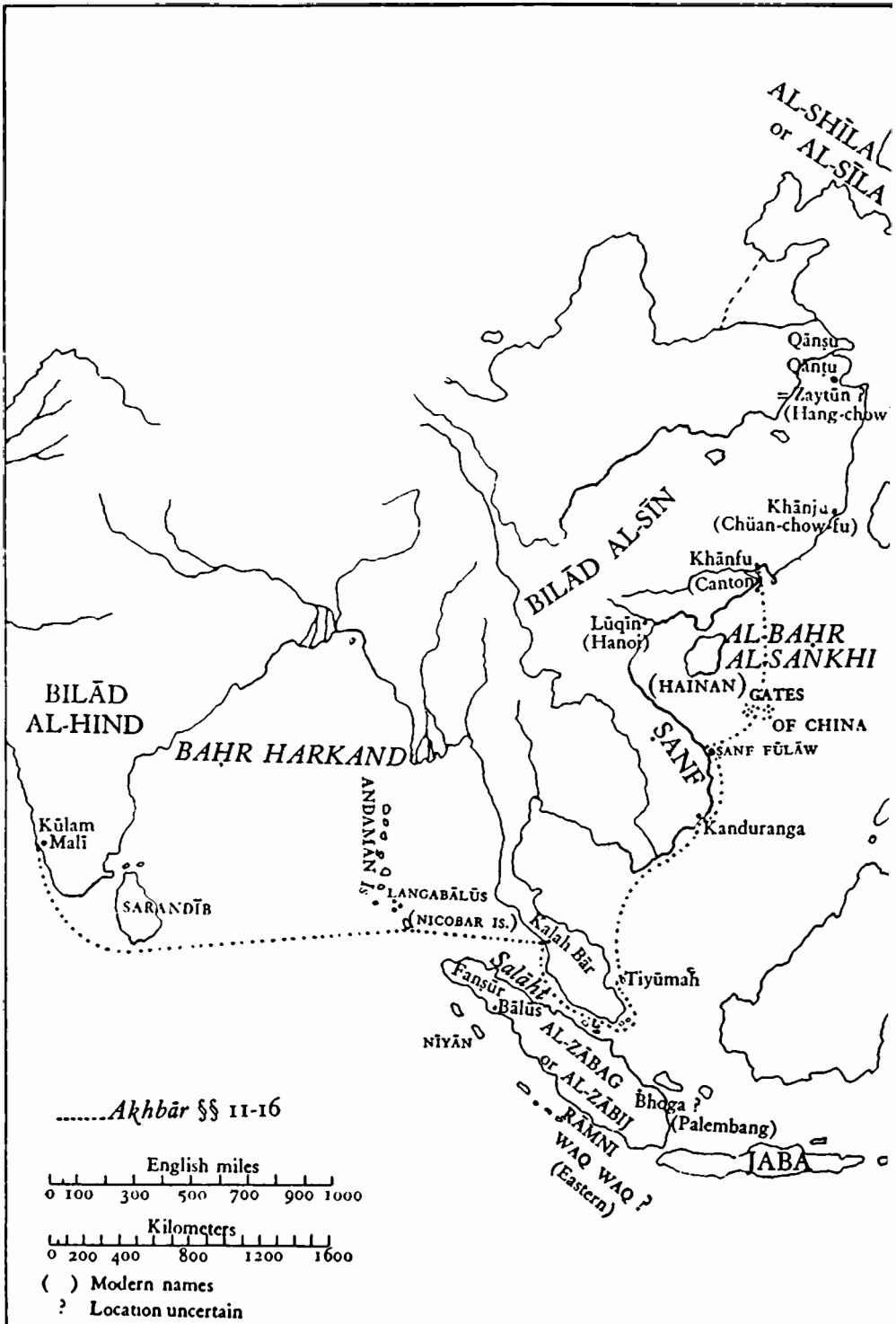
Since that year, Arab navigation in the Indian Ocean has undergone a slow decline. Other nations have come with steam-driven and oil-driven ships, passing through the Suez Canal to India, the East Indies, or Australia. But the Arab seamen of Quwayt and Aden still make their way to India and East Africa under sail. They have even forgotten what they knew, for their navigational knowledge is no longer sufficient to allow them to venture far from the coasts.

The life of these sailors, like that of the beduin in the desert, contains much that is fine. But sailing ships and camels alike have almost outlived their economic utility, and cannot be kept going for aesthetic reasons alone. One of the many tasks confronting the Arabs today is that of modernizing their transport on the high seas. In no other way can they recover the commercial position which they held in ancient and medieval times.[80]

[80] Ibn-Baṭṭūṭah, *Voyages*, ed. and Fr. tr. C. Defremery and B. R. Sanguinetti (Paris, 1879-93, 4 vols.), vol. IV. Ferrand, "L'element persan," etc. in *J.As.* (1924). "Shihāb al-Dīn" and "Sulaimān al-Mahri," in *Enc. Islam.* A. Villiers, *Sons of Sindbad*, pp. 158-59.



IV. THE MIDDLE EAST AND EAST AFRICA IN 'ABBASID TIMES



V. THE FAR EAST AS KNOWN TO THE ARABS IN 'ABBASID TIMES

III

THE SHIPS

Quale nell' arzana de Viniziani
bolle l'inverno la tenace pece
a rimpalmar li lor legni non sani,

che navicar non ponno, e in quella vece
chi fa suo legno nuovo, e chi ristoppa
le coste a quel che piu viaggi fece;

che ribatti da proda, e chi da poppa;
altri fa remi, ed altri volge sarti;
chi terzeruolo ed artimon rintoppa . . .
—Dante, *Inferno* XXI 7-15

GENERAL REMARKS

THERE is hardly any pictorial evidence for Indian Ocean shipping such as exists to clarify the ship types of the ancient Mediterranean. We have to rely on scattered literary sources of all periods down to later medieval times. To exclude all evidence later than the tenth century, on grounds of an artificial symmetry in this book, would have ruled out much valuable information. There are later Arab travelers and geographers, such as al-Idrīsi and ibn-Jubayr in the twelfth century, ibn-Baṭṭūṭah in the fourteenth; there are the books of nautical instructions of Aḥmad ibn-Mājid and Sulaymān al-Mahri; and there are short accounts by the European travelers of the thirteenth and fourteenth centuries—Marco Polo, John of Montecorvino and others. In attempting to reconstruct the Arab type of vessel in the classical days of the

'Abbāsids, we are on fairly safe ground in using evidence down to the coming of the Portuguese. Before that event, there is no reason to believe that ship types changed very much, except in certain features which will be noted. But after the Portuguese, European influences on Arab shipbuilding have been manifold. Thus we have to use with caution the detailed accounts of modern British travelers.

Within the broad limits of time mentioned, hardly any attempt is made to show the evolution of shipping at each period in chronological order. Such an attempt would leave too many gaps. There are risks in constructing a composite account from materials of different ages, but it seems less unsatisfactory than the chronological method.

Similarly, the treatment cannot be limited in space to the Arab world. The western half of the Indian Ocean, from Ceylon round to East Africa, forms a cultural unity, which has to be treated as a whole. Traditional ship types do not always take account of national barriers; evidence from Western India may be as significant as that which comes from the Persian Gulf. In the discussion of the evolution of the lateen sail it is necessary to range still further afield, over the whole of the Old World. On the other hand, we can make a fairly sharp distinction between the ships of the Mediterranean and the Indian Ocean; even the vocabulary of the two seas differed. Mediterranean ships are not dealt with here.

The outstanding features of the medieval Arab ship of the Indian Ocean are two: the manner in which the planks of the hull were sewn together, not nailed; and the fore-and-aft set of the sails. The modern type differs from its medieval forebear in two main respects: its planks are now usually nailed, and its stern is often square, not double-ended as in all the older vessels. These characteristics will be explained further in the detailed description which follows.

HULLS AND THEIR EQUIPMENT

Modern Arab types of craft take their various names, not from the rig as in Europe, but from the shape of the hull. Thus *baghalah, ganja, sanbūq, jihāzi* and other names are now applied to vessels with square, "transom" sterns, with various modifications of shape and decoration. But the square stern with its elaborate carving or painting is altogether a product of European influence since the sixteenth century. The older type is represented by the vessels now called *būm, zārūq, badan*, etc., which are double-ended, coming to a point at both bow and stern (Plate 1). But these names are not found in medieval literature. We find *sanbūqs* mentioned, but these cannot be of the modern square stern type; the name seems to refer to small craft of the Red Sea. Similarly we read of the *jalbah* in the Red Sea, of the *bārijah* of the Indian pirates, of the *zawraq, dūnīj* and *qārib* as small ship's boats. Many other names are barely mentioned in lists of names for "ship," "boat," recorded by certain authors. But in no single instance are we informed of the particular shape to which a name applies. None the less we can assume that the form of the hull was the basis of classification, then as today. The generic words for "ship" were *marḳab* and *safīnah. Fulḳ* is Koranic. *Daw* is a Swahili name, not used by the Arabs but popularized by English writers in the incorrect form "dhow."[81]

The timbers of hulls were of teak wood or coconut wood. "Teak" in Arabic and Persian is *sāj*, originally *sāg*, from

[81] J. Hornell, "A Tentative Classification of Arab Seacraft," in *Mariner's Mirror* (January 1942). A. Villiers, *Sons of Sindbad* (London, 1940), *passim*. R. L. Bowen, *Arab Dhows of Eastern Arabia* (Rehoboth, Mass., 1949). Lists of boat names can be found in Maqdisi, p. 31; Azdi, *Ḥikayāt abi-al-Qāsim al-Baghdādi*, ed. A. Mez (Heidelberg, 1902). See also J. Gildemeister, "Über arabisches Schiffswesen," in *Göttinger Nachrichten* (1882); H. Kindermann, *"Schiff" im Arabischen* (Zwickau, 1934).

The only statement of the length of a hull I have come across is in Buzurg, pp. 17-19, a ship of 50 common *dhirā'*, i.e. exactly 76 feet. The common dhirā' or cubit was 18.24 inches: see E. Nicholson, *Men and Measures* (London, 1912).

Prakrit *sāḳa*; (the European names are derived from the Dravidian form *tēḳa*). This wood is described by the *Encyclopaedia Britannica* (eleventh edition) as "the most valuable of all known timbers." It is very durable, and "Once seasoned, teak timber does not split, crack, shrink, or alter its shape. In contact with iron, neither the iron nor the teak suffers." It is not very hard, is easily worked, and has great elasticity and strength. It grows well in the hills of Southern India, Burma, Siam, and Indonesia. From ancient times it has been imported to the Persian Gulf from India, and has been found in Babylonian, Achaemenid and Sassanid remains. It is evidently referred to by Theophrastus (c. 300 B.C.) where he writes: "In the island of Tylus [al-Baḥrayn] off the Arabian coast they say that there is a kind of wood of which they build their ships, and that in sea water this is almost proof against decay; for it lasts more than 200 years if it is kept under water, while, if it is kept out of water, it decays sooner, though not for some time." As there is no such durable wood in the Persian Gulf area, this is almost certainly teak imported from India. Equally the "rafters and beams" mentioned by the *Periplus* as imports of Omana from Barygaza probably included teak for shipbuilding. Al-Mas'ūdi states plainly that ships of the Indian Ocean were built of teak. Ibn-Jubayr says that the timber for shipbuilding at 'Aydhāb was imported from India and al-Yaman.[82]

"Coconut" in Arabic is *nārjīl* or *nārgīl*, derived through Persian from Prakrit *nārgīl*. It is also called by the Arabs *al-jawz al-Hindi*, "the Indian nut," and this is the name used by

[82] *Enc. Brit.*, 11th ed., "Teak" (quoted). On ancient teak remains: Schoff's *Periplus*, p. 152; J. Hornell, "The Origins and Ethnological Significance of Indian Boat Designs," in *Memoirs of the Asiatic Society of Bengal*, vol. VII (Calcutta, 1920); W. Ouseley, *Travels in Various Countries of the East* (London, 1819 ff.), p. 280, note 67. Theophrastus, *History of Plants*, bk. V, ch. 4, Eng. tr. A. Hort in Loeb Classical Library (London, 1916), (quoted): *Periplus*, p. 36: *dokōn kai keratōn*, translated by Schoff "timbers of teakwood," by a legitimate inference. Mas'ūdi, *Murūj*, vol. I, p. 365; ibn-Jubayr, *Travels*, ed. W. Wright, 2nd ed. revised M. J. de Goeje (Leyden, 1907), p. 71.

Marco Polo. This tree seems to be native to Southern India, Indonesia, Ceylon, the Maldive and Laccadive Islands. Gradually it spread westward to Arabia: in the eleventh century Nāṣir-i-khusraw observed it in 'Umān, in the fourteenth ibn-Baṭṭūṭah mentions it as growing at Ẓafār, a port of Ḥaḍramawt in close commerce with India. But the older Arabs and Persians used either to import it from India and its islands, or to go and build their ships on the spot. The Maldives and Laccadives were the scene of a remarkable shipbuilding activity, for there ships were built entirely of the diverse products of the coconut tree: hulls, masts, stitches, ropes and even sails, as will be shown below. The ships made in this way were then loaded with coconut wood and fruit and brought to 'Umān and the Gulf.[83]

Thus the timber from which hulls were constructed, anywhere east or south of Suez, nearly always came from India and its islands. The only exceptions known to me are the fleets of Sennacherib and Alexander, built of timber from Lebanon or Upper Mesopotamia. The palm trees and cypresses which grow round the Persian Gulf were generally found unsuitable for ships' timbers.[84]

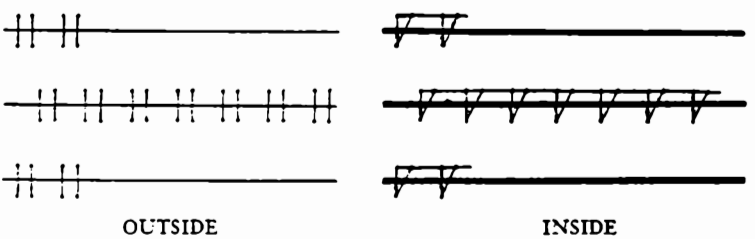
The hulls were put together in the simplest manner possible. First the keel was laid on the ground, then horizontal planks on each side were fastened to it and to each other by means of stitches (sing. *khayt*) of fiber. There is no mention in the sources of ribs or any framework, nor are these found in the two Greenwich Museum models of traditional Arab vessels, constructed by a boatman at Masqaṭ late in the nineteenth century. But ocean-going ships of any size *must* have had ribs, otherwise their hulls would have been too weak.

[83] *Enc. Brit.*, 11th ed., "Coconut"; *Tāj al-'Arūs*, "*Nârjîl*." Ibn-Baṭṭūṭah, vol. II, pp. 204 ff. *Periplus*, p. 17, mentions coconuts growing in East Africa, if Müller is correct in emending *ναυπλιος* to *ναργιλιος*. Abu-Zayd, pp. 130-31; Buzurg, p. 189; Idrīsi, fol. 19r.

[84] D. D. Luckenbill, *Ancient Records of Assyria and Babylonia* (Chicago, 1927), vol. II, pp. 318 ff.; Arrian, *Anabasis*, bk. VII, chs. 19-20; Hornell, "Indian Boat Designs," p. 194.

The sides were carvel-built (planks edge-to-edge), for clinker-built boats (with overlapping planks) are indigenous to North European waters and were not known in the Indian Ocean before the sixteenth century. The stitches were passed through holes bored at intervals near the edges of adjacent planks. In the Greenwich Museum models, they are pulled tight on the inside over stringers, long narrow pieces of wood. It is possible that the stringers are a modern invention, but it is hard to see how carvel planks could have been held together without either stringers or ribs. Neither nails nor treenails were used in the whole construction.[85]

FIG. 1. TWO PLANKS



The use of stitches instead of nails to fasten the planks was noticed by all observers—Greek, Indian, Arabic and European—and does indeed deserve the fullest attention. The best description of the stitches is given by ibn-Jubayr concerning the *jalbahs* built at 'Aydhāb: "For they are stitched with cords of coir [*qinbār*], which is the husk of the coconut: this they [the builders] thrash until it becomes stringy, then they twist from it cords with which they stitch the ships." Threads of palm fibers, and even of rushes and grass, are also mentioned. The stitches are clearly visible in two historical illustrations: on one of the Sanchi sculptures of the second century B.C., and in a painting accompanying al-Ḥarīri's *Maqāmāt* in the thirteenth century A.D. (Plate 7).

[85] W. H. Moreland, "The Ships of the Arabian Sea about A.D. 1500," in *J.R.A.S.* (January and April 1939). Idrīsi, fol. 8ar.

This manner of construction was observed by ancient and medieval writers in the Red Sea, along the East African coast, in 'Umān, the Persian Gulf, the Malabar and Coromandel coasts of India, the Maldive and Laccadive Islands. In fact it is fairly clear that this was the only method indigenous to the western half of the Indian Ocean before the fifteenth century.[86] Soon after 1500, the ships of Malabar were already being built with many iron nails, according to European observers; this may be due to a desperate attempt to imitate the new Portuguese enemy, or to the example of the Chinese junks which had long been visiting Calicut. Since the coming of European ships the sewn vessels have been gradually driven out of most waters by iron-fastened vessels. But they still survive in humble forms—fishing boats and canoes—on coasts remote from modern economic influences: South and East Arabia (Plate 8), South India and the adjacent isles; until recently Lamu in Kenya.[87]

We can only guess how, where, and why this method originated. All round these shores we have records of the usual primitive craft—skin boats, reed bundles, and dug-out

[86] Sources for sewn ships: (a) Indian: see R. Mookerji, *A History of Indian Shipping and Maritime Activity* (London, 1912); J. Marshall and F. Foucher, *The Monuments of Sanchi*, vol. II, pl. 51. (b) Greek: *Periplus*, pp. 15-16, 36, 60; Procopius, *Persian Wars*, bk. I, ch. 19. (c) Arabic: Ya'qūbi, p. 360, abu-Zayd, pp. 87-88, 130-31; Mas'ūdi, *Murūj*, vol. I, p. 365; Idrīsi, fols. 19r, 34r, 84r; ibn-Jubayr, pp. 70-71 (quoted); ibn-Baṭṭūṭah, vol. IV, p. 121. Ḥarīri ship, see Plate 7 and comments. (d) European: Jordanus, *Mirabilia Descripta*, Eng. tr. H. Yule (London, 1863), Hakluyt 1st Series, vol. XXXI, p. 53; John of Montecorvino in Yule, *Cathay and the Way Thither* (London, 1915, 2nd ed.), pt. III, p. 67: Marco Polo, Eng. tr. H. Yule, 3rd ed. (London, 1903), vol. I, p. 111; Friar Odoric, in M. Komroff, *Contemporaries of Marco Polo* (London, 1928), p. 217; G. Carreri, quoted by A. W. Stiffe, "Former Trading Centres of the Persian Gulf," in *Geographical Journal*, vol. XII, p. 294. See Moreland.

[87] Moreland in *J.R.A.S.* (April 1939), pp. 179 ff., discusses the Portuguese and Italian observations of nails in Arab ships of this period. Present-day survivals of sewn ships: Villiers, pp. 54, 131; B. Thomas, *Arabia Felix* (London, 1932), p. 2; Hornell, "Indian boat designs," and "The Sea-Going Mtepe and Dau of the Lamu Archipelago" in *Mariner's Mirror*, vol. XXVII (January 1941), pp. 54-68. I shall not attempt to name the many references in Western writings since the Renaissance: some are mentioned by J. Hornell, *Water Transport: Origins and Early Evolution* (Cambridge, 1946), p. 235.

canoes. It seems that canoes were first enlarged by the superimposition of planks stitched upon the underbody. The Indian provenance of the teak wood and coconut wood used in historical times may be taken to indicate that the method of stitching, too, was spread from India. This may be so; but we cannot rule out the possibility that stitching was first used on palm wood in the Persian Gulf and later transferred to the superior timbers imported there from India, and even spread from there to India itself. The reason for the use of the stitching method in the first place must surely have been that the materials for stitching lay close at hand to primitive men in these regions, whereas iron or bronze for nails were still hard to procure.[88]

No more than this can be said about origins. But of greater interest is the question: Why did the stitching method survive for so many centuries after the use of nails was known and feasible? The weakness of the sewn ships was apparent to observers from Mediterranean regions: to ibn-Jubayr who came from Spain, to Marco Polo, to Jordanus; to John of Montecorvino who writes: "The ships in those parts are mighty frail and uncouth with no iron in them and no caulking [see below]. And so if the twine breaks anywhere there is a breach indeed! Once every year, therefore, there is a mending of this, more or less, if they propose to go to sea."

To build really large ships such as the Chinese junks was impossible by this method. These craft were likely to come to pieces under prolonged buffeting by violent winds and waves, and we get the impression from Buzurg that shipwreck by storm was all too frequent. If such vessels sailed to China and Mozambique, it was due to the courage and skill of their sailors and the desire for gain of their merchants. Even when wreck did not occur, water was always

[88] Agatharchides, p. 101; Isidore of Charax, p. 20 (in *Geog. Gr. Min.*, vol. 1); *Periplus*, pp. 7, 27; Pliny, *N.H.*, bk. VI, ch. 34. Hornell, *Water Transport.*

being bailed out of the bilge well, due to the leaky seams as well as the absence of decks. (See below pp. 97-98.)

> . . . gemuit sub pondere cymba
> sutilis, et multam accepit rimosa paludem.
> (Vergil)[89]

(". . . the sewn boat creaked under the load, and leaking took in much water of the marsh".) If sewn ships, then, were so weak, why did they survive? This was felt to be a problem by many ancient and medieval writers, and they offer a wide variety of reasons to explain it.

(i) An ancient Sanskrit writer, Bhoja, is the first to bring forward the theory that there were magnetic rocks (loadstones) in the sea, which would drag iron-fastened ships to their doom. This legend must have been widespread in antiquity, for it is mentioned again by Procopius. But Procopius refutes it by sound reasoning, pointing out that Greco-Roman ships in the Red Sea do have nails and other parts of iron, yet have never suffered any harm. But the legend crops up again in two fourteenth century works, an Arabic description of an "Expedition against Alexandria" and the fabulous "Travels" of Sir John Mandeville.[90]

(ii) Two of the versions of Marco Polo attribute the absence of iron nails in the ships of Hurmuz to the hardness of the wood used, which was said to split if iron nails were driven in. But even if this explanation is true of those particular ships, it is not of general application. It has been seen that teak wood at least is eminently workable; and the

[89] Ibn-Jubayr, pp. 70-71; Marco Polo, vol. I, p. 111; Jordanus, p. 53; Montecorvino in Yule, *Cathay*, pt. III, p. 67 (quoted). Vergil, *Aeneid*, bk. VI, lines 413-14 (quoted). Buzurg; Moreland. Hornell, *Water Transport*, p. 236: sewn boats in Ceylon, recently extinct, had to be annually taken to pieces, reassembled and resewn.

[90] Bhoja, in Mookerji, p. 21; Procopius, *Persian Wars*, bk. I, ch. 19; "Expedition against Alexandria," ed. J. Gildemeister; "Über Arabisches Schiffswesen," in *Göttinger Nachrichten* (1882), p. 437; Mandeville, ed. J. Ashton (London, 1887), ch. 53, p. 125.

fact that iron has now been long in use all over this area disproves this reason.[91]

(iii) Another insufficient reason is given by al-Mas'ūdi, in a valiant attempt to find a scientific explanation: "Now this kind of structure [stitching] is not used except in the Indian Ocean; for the ships of the Mediterranean and those of the Arabs [there] all have nails, whereas in ships on the Indian Ocean iron nails do not last because the sea-water corrodes the iron, and the nails grow soft and weak in the sea; and therefore the people on its shores have taken to threading cords of fibre instead, and these are coated with grease and tar." This argument has no force, because the two seas differ only to a negligible degree in salinity and other chemical qualities. On the contrary, the teak timbers of the Indian Ocean do not give rise to iron-sickness as the oak timbers of the Mediterranean.[92]

(iv) A possible advantage of sewn hulls, noticed by ibn-Jubayr, al-Idrīsi and ibn-Baṭṭūṭah, is that they are pliant, and so less easily broken than nailed ships if they run onto the coral reefs of the Red Sea or elsewhere. Similarly, on the Coromandel and Malabar coasts of India sewn boats can ride ashore on the heavy surf and stand the shock of being landed on a sandy beach from a breaker.[93]

(v) But probably the decisive reason for the survival of sewn vessels was the comparative expensiveness of construction with iron in the regions with which we are concerned. It is not that iron was not available. It has always been mined and worked in many regions of India, in Iran, in Sudan (but inland); and it could be obtained in Egypt. But it seems

[91] Marco Polo, Latin 2 and Ramusio, *ad loc. cit.*; see Moreland, pp. 68 ff. and 182 ff.

[92] Mas'ūdi, *Murūj*, vol. I, p. 365 (quoted). Vegetius, *Epitome Rei Militaris*, ed. C. Lang (Leipzig, 1885), bk. IV, ch. 34. J. Johnstone, *Introduction to Oceanography* (London, 1923), p. 137. Moreland, pp. 191-92.

[93] Idrīsi, fol. 84r; ibn-Jubayr, pp. 70-71: ibn-Baṭṭūṭah, vol. IV, p. 121. J. Bruce, *Travels to Discover the Source of the Nile*, 3rd ed. (Edinburgh, 1813), vol. II, p. 107.

that the processes of mining, smelting, and manufacturing the nails was expensive in India, and in the other regions the iron-industry was on a small scale. Iron-fastening could not compete in cheapness with stitching, the raw material for which was ready to hand, and required no elaborate manufacture. Strangely enough, this economic reason is not mentioned in any of the sources; yet it provides the simplest and most substantial explanation.[94]

(vi) And after all this has been said, it is permissible to mention the force of tradition. Men are not wholly rational; seamen are notoriously conservative. A slight balance of superiority in the nailing method would not be enough to drive out the older ways. It was only when European commerce changed the entire economy of the Indian Ocean that the sewn ships began to disappear rapidly.

After the hull was put together, it had to be protected from the inroads of the sea. Proper caulking of solid substance is mentioned by only one author, ibn-Jubayr: he refers to something called *dusur* "from the wood of the date palm," and we can translate this "oakum." John of Montecorvino denies that there was any caulking in the ships which he saw on the Arabian sea. Generally the Arabic authors say that the seams were blocked with a mixture of pitch or resin and whale oil. Al-Idrīsi in describing whales in the Indian Ocean writes, ". . . they catch the smallest, which they cook in cauldrons, so that their flesh melts and changes into thick liquid. This oily substance is renowned in al-Yaman, Aden, the coasts of Fāris, 'Umān, and the sea of India and China. The people of these regions use this substance to block the holes in their ships." This also served the purpose of protecting the bottom against the ravages of

[94] Moreland, p. 188, shows the high cost of iron around A.D. 1600, the earliest time for which figures are recorded. The only real puzzle is about Egypt: why were the ships of al-Qulzum different from those of Alexandria? Perhaps we must fall back on (IV), the pliancy of sewn ships, bearing in mind the coral reefs of the Red Sea.

the shipworm. Coating was generally of fish-oil—ibn-Jubayr says shark-oil is the best.[95]

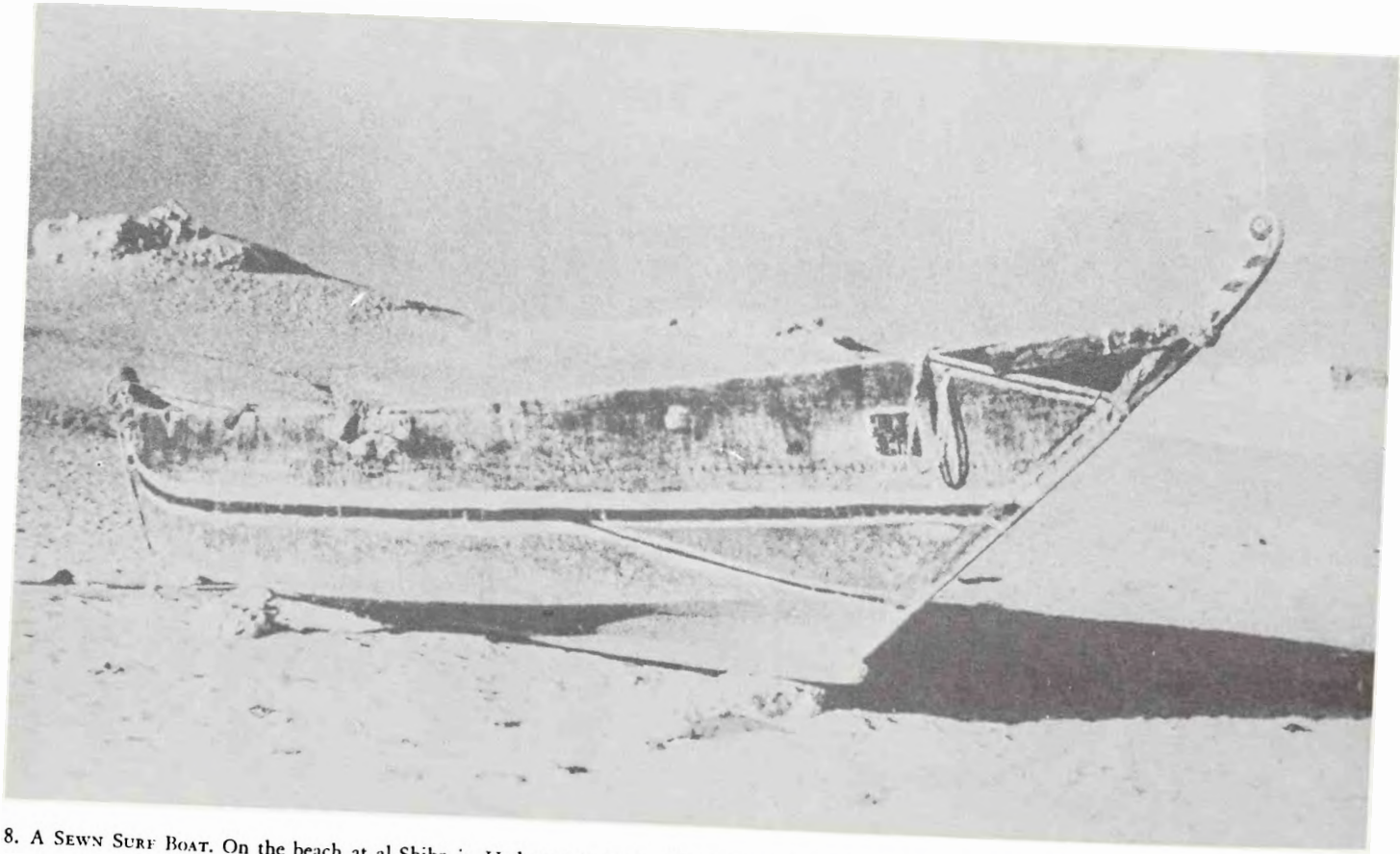
The extent of decks is obscure. Jordanus writes of Malabar, "Nor are the vessels ever decked over, but open, and they take in water to such an extent that the men always, or almost always, must stand in a pool to bail out the water." And Marco Polo says of the ships of Hurmuz that they have no deck, but the cargo is covered with hide. There are similar statements by Duarte Barbosa and Varthema about the ships of Malabar soon after 1500. I have not come across a single mention of decks on the Arab ships of the Indian Ocean. On the other hand Buzurg mentions cabins (*balanj*), and it is hard to believe that ships which could hold 400 men, such as he mentions, were without decks over some part of their extent.[96]

The only kind of rudder known in the ancient and medieval world was the side-rudder, consisting of a large oar on the quarter. There had to be one on each side in seagoing ships, because if there was any wind on the beam the rudder on the windward side might be clean out of the water or not deep enough to have any effect. This double rudder may be indicated by the dual form of the Arabic word *sukkān*. By the thirteenth century, however, the Arabs had a stern-rudder. John of Montecorvino says, "And they have a frail and flimsy rudder, like the top of a table, of a cubit in width,

[95] Ibn-Jubayr, p. 70. On *dusur*: Wright's glossary to ibn-Jubayr, 1st ed., p. 22; Jawhari's definition; translated as "filamenti" by C. Schiaparelli, *Ibn Ǵubayr, Viaggio* (Rome, 1906), p. 42. Contrast *Koran* 54:13, where it is understood as "wooden pegs." Montecorvino, in Yule's *Cathay*, pt. III, p. 67. Abu-Zayd, pp. 140-41; Mas'ūdi, *Murūj*, vol. II, p. 365; Idrīsi, fols. 24r (quoted), 34r, 84r; Marco Polo, in Yule's transl., vol. I, p. 111. Procopius, *Persian Wars*, bk. I, p. 19, says, "For neither are they smeared with pitch, nor with any other substance," but I think his informant must be mistaken in this sweeping statement.

[96] Jordanus, p. 53 (quoted); Marco Polo, in Yule's transl., vol. I, p. 111. Duarte Barbosa, in Hakluyt Society, 2nd Series, vol. XXXIX, p. 76; Varthema, in Hakluyt Society, 1st Series, vol. XXXII, p. 152. Buzurg, pp. 33, 94, 141 (cabins); 165 (a ship holding 400 men); also 53 (200 slaves). Small ships are still undecked, see Villiers' account of a *zārūq* in the Red Sea, pp. 5-7.

7. The Ḥarīri Ship. From a manuscript of al-Ḥarīri's *Maqāmāt* in the Schefer collection, Bib. Nat. *MS. arabe* 5847, fol. 119v.; done by the scribe, a man of Wāsiṭ in Mesopotamia, in A.H. 634 (A.D. 1237). Evidently the artist was no seaman. Amid many puzzling features the following can be considered certain: the stitching which can be seen joining the planks; the stern-rudder; the grapnel anchor; the sailors bailing out water; the look-out boy (*dīdbān*); the merchants in their cabins. Cf. E. Blochet, *Mustulman Painting* (London, 1929), Plate 17, a boat on the Euphrates. Photograph by staff of the *Bibliothèque Nationale*, Paris.



8. A Sewn Surf Boat. On the beach at al-Shiḥr, in Ḥadramawt, 1939. The ancient method of stitching, which this photograph illustrates, survives now only in the remotest places. (*Photograph by A. Villiers.*)

in the middle of the stern." This is just what is shown in the illustration to al-Ḥarīri's *Maqāmāt* in 1237 (Plate 7). Now the earliest definite representation of a stern-rudder in Europe is dated 1242, on the seal of Elbing in Germany. But I have not been able to explain the simultaneous appearance of the stern-rudder in these two widely separated regions.[97]

Anchors (sing. *anjar, angar*) were crude. Gemelli Carreri in the last decade of the seventeenth century saw them of stone in the Persian Gulf, with a hole through the middle for the ropes. Varthema found them of marble at Calicut. But metal anchors were perhaps known, as they had been in the Mediterranean for a long time. The Ḥarīri ship appears to have a metal anchor of grapnel shape, such as is still commonly found on the sailing ships of these parts. An oceangoing ship in the tenth century might have as many as six anchors.[98]

Ships had smaller boats aboard, and from Buzurg these appear to have been of two sorts, the *qārib* and the *dūnīj*. The *qārib* was the larger, for on one occasion it took fifteen men compared with four in the *dūnīj*; and it could take as many as thirty-three men. It was used as a lifeboat. On one occasion recorded it was set to tow the ship by oar, when the ship's mast had been jettisoned and there was no other means of propulsion. The *dūnīj* was used as a shoreboat or lifeboat, and in an emergency might even be fitted out with a mast and sail. Also the Arabs have always had the practice of carrying small boats for sale; these may either be made aboard by the ship's carpenter, or ashore like the *madarata*, "local sewn boats," which were exported from 'Umān to al-Yaman in the time of the *Periplus*.[99]

[97] Montecorvino, in Yule, *Cathay*, pt. III, p. 67 (quoted). Ḥariri illustration (Plate 7). G. S. L. Clowes, *Sailing Ships* (London, 1930), pt. I, p. 48.

[98] Ar. *angar* or *anjar*, from Pers. *langar* (the *l* becoming part of the Ar. article); or possibly from Gk. *angkura*? Carreri, quoted by A. W. Stiffe in *Geog. Journ.*, vol. XII, p. 294. Varthema, p. 152. Buzurg, p. 87.

[99] Buzurg, pp. 44, 61, 69, 86, 88, 167, 191. *Periplus*, p. 36. Villiers, pp. 28-29.

MASTS AND SAILS

The mast in these waters was usually termed *diql* or *daqal*, literally "palm trunk." This shows the original material of masts round the coasts of Arabia; but in the Middle Ages they were being made of coconut wood and probably of teak wood. It can be assumed that yards were of the same timber. The vessels seen by Marco Polo and Montecorvino had only one mast, and the Arab authors usually speak of the mast in the singular. But occasionally we meet a phrase such as *al-daqal al-akbar* which implies the presence of more than one. Masts must have been very tall in proportion to the length of hulls, as in modern Arab craft; Buzurg mentions one of fifty *dhirā'*, i.e. seventy-six feet.[100]

Sails (sing. *shirā'*, *qilā'*) were woven from the leaves of the coconut tree or the palm tree, or made of cotton sailcloth. Marco Polo and Montecorvino saw but one sail. Buzurg sometimes speaks of sails in the plural: al-Mas'ūdi of "the great sail (*al-qilā' al-'azīm*) which is the *shirā'*." But perhaps these phrases merely imply the existence of a smaller spare sail. In the nineteenth century Captain Colomb observed of the Arab slave-vessels, "there is no arrangement for reefing in bad weather: but every sea-going dhow carries two yards and two sails, one large, as described, for daylight and fine weather, the other small, for night and foul weather."[101]

The typical sail of the Arabs is the lateen, in fact it is the only sail used by them, now or at any recorded time in the

[100] Abu-Zayd, pp. 130-31; Mas'ūdi, *Murūj*, vol. I, p. 344; vol. IV, p. 27; Buzurg, p. 87, *al-daqal al-akbar*. Marco Polo and Montecorvino, *loc. cit.* Buzurg, pp, 43-44. A. Köster, *Das antike Seewesen* (Berlin, 1923), pp. 42-44, mentions a peculiar manner of securing the mast to a post, fixed to the bottom of the hull, as found only among the ancient Egyptians, the modern Arabs of the Red Sea, and the Malayans of the Malabar coast. This is one indication of Egyptian influence on Arab shipbuilding.

[101] Abu-Zayd, pp. 130-31; ibn-Jubayr, p. 68. Marco Polo and Montecorvino, *loc. cit.* Varthema, p. 153. Buzurg, p. 23, etc.; Mas'ūdi, *Murūj*, vol. I, p. 234. P. H. Colomb, *Slave-catching in the Indian Ocean* (London, 1873), p. 38 (quoted); cf. Hornell, "Arab Sea-craft," p. 11, three suits of sail are often carried.

past, from Morocco to India, the Persian Gulf to Mozambique. The lateen is a triangular fore-and-aft sail, very tall and high-peaked. In the Indian Ocean the fore angle of the sail is cut off to form a luff. The shape thus formed appears to be the third of four stages in the evolution of fore-and-aft rig from square rig. It will be suitable at this point to go through the entire process and show the part played by the Arabs in it. Here we cannot use close historical methods because of the paucity of evidence; we have to work on a broad canvas, using historical imagination to reconstruct the most likely course of evolution.

(i) In the ancient world, the square sail was employed universally in the Mediterranean, on the seagoing ships of Egyptians, Phoenicians, Greeks, and Romans. In Hellenistic and Roman times a spritsail was sometimes set on a small raking foremast, the *artemōn*, in order to sail with a beam wind. This was a valuable device, but it was still a square sail. In India, square sails are depicted on coins of the Pallava dynasty (coeval with the Sassanids) and in the Ajanta ship of the seventh century A.D. (Plate 4). An indication that lateens are not native to India is found in their absence today in inland waters, that is to say in regions remote from foreign influences. Northern Europe, too, knew only square rig until the late Middle Ages.

Square rig has the advantage of stability on large ships and in heavy seas, and remained the principal type on European vessels until the latest days of sail. But for maneuvering and tacking on rivers and narrow waters, the fore-and-aft sail has an advantage, since it can keep much closer to the wind. Therefore from an early age we find attempts to modify the square sail in that direction.[102]

[102] On the general history of sail: R. and R. C. Anderson, *The Sailing Ship* (London, 1926); G. S. L. Clowes, *Sailing Ships* (London, 1932), and *The Story of Sail* (London, 1936); H. W. Smyth, *Mast and Sail in Europe and Asia* (London, 1906); E. K. Chatterton, *Fore and Aft Craft and their Story* (London, 1927); A. Köster, *Antike Seewesen* (Berlin, 1923), and *Studien zur Geschichte des*

(ii) The simplest step was to set a square sail fore and aft, tilting it downward at the fore end. This made a balance-lug. This seems to have been done on the Nile several centuries B.C. at least; on this river it was particularly useful in sailing downstream against the prevailing north wind. A survival of it is found in the Sudanese *naggar*-lug. A balance-lug is also found in Indonesia, first appearing on the bas-reliefs of Boro-Budur in Java which perhaps date from the tenth century. The Javanese *proa* which survived until recently has a similar style; the sail is much broader than high. Since ancient Egyptian influences have been observed in the forms of the traditional Javanese hull, it is tempting to conclude that the sail too was diffused from Egypt. But this cannot be taken as proved. There is a wide gap between the two regions, in which there is no trace of a balance-lug at any period. Balance-lugs of various types also survive in Indo-China, sandwiched between Chinese junk types to north and west.

(iii) From this it was a natural development to shorten the fore-portion of the sail and heighten it abaft, in order to catch more wind. This would produce the type of lateen described above as found in the western half of the Indian Ocean. Is there any indication of where this step was first taken? We can probably rule out Egypt and India, for in both of these countries we have seen that older types survive in their remoter waters; thus the lateen must be an introduction from outside. On the Nile it is associated with an Arab build—keel, high stem and short stern-post—whereas the ancient Egyptian vessels lacked these features and had spoon-shaped hulls.[103]

---

antiken Seewesens (Leipzig, 1934). On Pallava coins: W. Elliott, *Coins of Southern India* (London, 1885), pl. 1, fig. 38. On the Ajanta ship: see Plate 4 and comments. The matsails of Chinese junks are omitted from my account: they are a superior type but have had their own distinct history, neither influenced by nor influencing other types to any significant extent.

[103] Clowes, *Story of Sail*, p. 87. J. Poujade, *La route des Indes et ses navires*

This leaves us with three possible areas, the Mediterranean, the western half of the Indian Ocean, and the Pacific. Leaving aside the Pacific for the moment, we may consider whether this type of lateen is more likely to have spread from the Mediterranean to the Indian Ocean or vice versa. The mere fact that this type of lateen no longer exists in the Mediterranean proves nothing; it is always possible that it might have originated there and later given way there to the still superior triangular form. But there are more substantial reasons for believing that the lateen came from the Indian Ocean to the Mediterranean. The earliest evidence of the existence of lateens in the Mediterranean is in Greek Byzantine manuscripts of the late ninth century, which show drawings of lateens (Plates 5 and 6). In antiquity, as has been shown, only the square sail was found in this sea. Thus we are led to suspect that the lateen came to the Mediterranean in the wake of the Arab expansion. In the Indian Ocean, Arabic literature of the ninth and tenth centuries sometimes likens a ship's sail seen from a distance to the fin of a whale or a whale's spout. These images strongly suggest the tall lateen rather than any type of square sail. Before that we have no evidence at all, but at least it can be said that there is no trace of a square sail anywhere among the Arabs. Another possible indication that the Arabs brought the lateen to the Mediterranean is the Italian name *mezzana*, with its offspring French *misaine*, English "mizzen," etc. It has been suggested that *mezzana* is from the Arabic word *mīzān* meaning "balance"; and that the mizzenmast (with lateen sail) found on Italian ships of the later Middle Ages was borrowed from an Arabic mizen, called a balance because of its position as a supplementary mast balancing the main mast. The derivation

(Paris, 1946), ch. 5: the author gives good reasons for believing that the balance-lug spread eastwards from India, but has no decisive evidence to show that India was its original home. R. L. Bowen, *Arab Dhows of Eastern Arabia*, pp. 1-10, advocates a Persian Gulf origin for fore-and-aft sails, again, in my view, without decisive evidence.

of *mezzāna* from *mīzān* is perfectly possible, linguistically. On the other hand there is equally no objection to the derivation of Italian *mezzana* from Latin *mediana* meaning "middle."

It is quite probable, then, that the lateen was brought to the Mediterranean by the Arabs. And if this is so, it may be counted as ultimately one of their major contributions to material culture. For without the lateen, the European mizen on the three-masters would have been impossible, and the ocean voyages of the great explorers could never have taken place. Clowes writes,

". . . In the North, the momentous passage from one single square sail to the three-master, completely square-rigged save for her lateen mizen, was fully completed within the short space of the fifteenth century.

"In 1400 northern ships were entirely dependent on a fair wind, and were quite unable—and never attempted—to make headway against an adverse wind, while before 1500 ships had been able to make the long ocean voyages which had resulted in Columbus' discovery of America, Diaz's doubling of the Cape of Good Hope, and the opening of the Indian trade route by Vasco da Gama.

"Other scientific advances, such as the introduction of the mariner's compass from China, bore their part in making such voyages possible, but without the far-reaching improvements in masts and sails the great discoverers could never have accomplished their work."[104]

[104] Byzantine drawings: Bibliothèque Nationale, MS. grec, no. 510, fols. 3 and 367v.; H. H. Brindley, "Early Pictures of Lateen Sails," in *Mariner's Mirror*, vol. XII (1926), pp. 9-22; see also A. Jal, *Glossaire des termes nautiques* (Paris, 1848), pp. 257, 915; Anderson, pp. 102-3; J. Sottas, "An Early Lateen Sail in the Mediterranean," in *Mariner's Mirror* (1939), argued for Byzantine lateens in A.D. 533; but probably triangular topsails, Bowen, p. 7, note 9. R. H. Dolley, "The Warships of the Later Roman Empire," in *Journal of Roman Studies*, vol. XXVIII (1948), pl. v, has constructed a model of a Byzantine oared *dromōn* of the tenth century, with three masts and lateen sails. On sails and whales: *Akhbār*, sec. 3; Mas'ūdi, *Murūj*, vol. I, p. 234; Buzurg, pp. 14-15, 101. On *mezzana*: Clowes, *Sailing Ships*, p. 53; K. Lokotsch, *Etymologisches Wörterbuch der europäischen*

It remains to consider whether the Arabs and Persians of the western Indian Ocean took the lateen from the Pacific, or vice versa, or whether it arose independently in both areas. Many forms of efficient lateen sail are found in the Pacific, and they were in use when Magellan came to the Ladrone Islands in 1521. It has been conjectured that these were indigenous there and spread westward to the Arabs and other peoples. But it is hard to bridge the large gap in the East Indies where no trace of a lateen is found. In reality there is not enough evidence to enable us to judge soundly the relation between the two lateen areas.[105]

(iv) The final stage in the development of the lateen was that the fore-part should end in a point at the foot, making a completely triangular sail. This evolution first occurred in the Mediterranean. It is found in the earliest Byzantine drawings of lateens (Plates 5 and 6), so we cannot know whether the step was taken by Arabs or Greeks on the Mediterranean. But since the Arabs kept their old form in the Indian Ocean, we should probably attribute the new development to another nation, the Greeks.

The lateen reached North European waters at the end of the Middle Ages, and there developed into every sort of fore-and-aft rig.

NAVIGATION AND LIFE AT SEA

The subject of navigation is highly technical, and it must suffice to deal with it in the most general way. Primitive mariners never sailed out of sight of a coast. They may have

---

Wörter orientalischen Ursprungs (Heidelberg, 1927); W. Meyer-Lubke, *Romanisches etymologisches Wörterbuch* (Heidelberg, 1911). Clowes, *Sailing Ships*, p. 54 (quoted). In Leo VI, *Naumachica*, ch. 7, ed. A. Dain, *Naumachica* (Paris, 1943), occur the words *περὶ τὸ μέσον τοῦ καταρτίου*. Dolley, *op. cit.*, p. 51, suggests as an emendation *περὶ τὸ μέσον κατάρτιον*, and thinks this *meson* may be derived from Ar. *mīzān*. Leo VI was Emperor A.D. 886-912.

[105] H. H. Brindley, "Primitive Craft—Evolution or Diffusion," in *Mariner's Mirror* (July 1932).

begun to lay their courses on certain well known stars. But for direct ocean crossings a considerable knowledge of astronomy was required. The Phoenicians had access to the astronomical science of Babylon. The Greeks developed it to a new level at Alexandria. Of the early Arabs, we only know that at the time of the *Koran* they did use the stars for guidance: "He it is who hath appointed for you the stars that ye guide yourselves thereby in the darknesses of land and sea; we have made the signs distinct for a people who have knowledge."

This reminds us that the desert is as trackless as the sea; it was probably on camel-back that the Arabs first learned to take guidance from the signs of the sky, for want of landmarks. It is not surprising that the pagan Arabs were star-worshippers. The *Koran* also indicates plainly that not every man could read the sky, any more than a book; knowledge was required. But we do not know how far this knowledge went.[106]

Under the 'Abbāsid caliphs, especially al-Ma'mūn, scientific astronomy developed rapidly. In the eighth century Persian and Indian works were translated into Arabic, in the ninth the *Almagest* of Ptolemy Claudius and other Greek works. There were observatories at Junde-Shapur, Baghdād, Damascus and elsewhere; astrolabes were constructed on the Greek model from the earliest 'Abbāsid days; an astronomical treatise was written by 'Ali ibn-'Īsa before 830. Then through the centuries the great Moslem astronomers followed, al-Khwārizmi, al-Battāni, al-Bīrūni, al-Khayyām, quite surpassing the ancient Greeks.

The windrose of the Arabs, like that of all other nations except the Chinese, contained thirty-two rhumbs. These were named after the rising and setting of fifteen fixed stars, with the addition of North and South. Many Persian names are

[106] Köster, *Antike Seewesen*, pp. 51, 190-93. *Koran* 6:97, Eng. tr. R. Bell (quoted); cf. 16:12, 16.

found, e.g. *quṭb al-gāh, mutlaʿ al-silbār, ḳhann* (rhumb), which the Arabs must have learned from a Persian wind-rose. But many other names are Arabic, and in some cases an older Arabic name was displaced by a Persian: e.g. the pole was *banāt naʿsh* before it became *quṭb al-gāh*. Latitude was determined by the height of the sun or the pole star, which were measured by a primitive finger-system. Astrolabes were perhaps difficult to use at sea, because of the rolling of the ship which made it hard to determine the vertical line accurately. But they could certainly be used on shore, and the latitude of every port and headland must have been recorded in the books of nautical instructions or *rahmānis*.[107]

Besides astronomical tables and latitudes, the *rahmāni* contained information about winds, coasts, reefs, in fact everything that a captain would need to know. The earliest mention of a *rahmāni* is by al-Maqdisi at the end of the tenth century: "I was thus thrown in to the company of men—captains, pilots, . . . agents and merchants,—who, bred and born upon it, possessed the clearest and fullest knowledge of this sea, its anchorages, its winds and its islands. I plied them with questions concerning its position, physical peculiarities and its limits. I have also seen in their possession sailing directories [*dafātir*] which they constantly study and follow with implicit confidence." Al-Maqdisi also mentions charts (*ṣuwar*).

Aḥmad ibn-Mājid, writing at the end of the fifteenth century, preserves a record of an old *rahmāni* composed by the

[107] G. Ferrand, *Introduction à l'astronomie nautique arabe* (Paris, 1928). Besides chapters written by Ferrand and de Saussure, this book reprints two important articles: J. Prinsep, "Note on the Nautical Instruments of the Arabs," from *Journal of the Asiatic Society of Bengal* (December 1836), pp. 784 ff., and L. de Saussure, "L'origine de la rose des vents et l'invention de la boussole," from *Archives des sciences physiques et naturelles*, vol. v (Geneva, 1923).

C. A. Nallino, "Astronomy," in *Enc. Islam*; Hitti, *History of the Arabs*, p. 375; N. Ahmad, "Muslim contributions to astronomical and mathematical geography," in *Islamic Culture*, vol. xviii (July 1944); R. T. Gunther, *The Astrolabes of the World*, 2 vols. (Oxford, 1932), pp. 524-25.

celebrated captains, Muḥammad ibn-Shādhān, Sahl ibn-Ābān, and Layth ibn-Kahlān. Ibn-Mājid's source was a *rahmāni* written by the grandson of Sahl ibn-Ābān and dating from 580 years ago, i.e. 315 A.H. or A.D. 927/928. This puts the three "Lions" (as they were called by a pun on the name "Layth") in the latter part of the ninth century. Ibn-Mājid criticizes their work as being unpolished in form, a mere compilation, and based on experience of little more than the Persian Gulf. Then he mentions some later notable seamen, giving as a date for one of them c. 400 A.H. or A.D. 1010. Of these he writes, "Their principal science consisted in descriptions of coasts and their extent, mostly 'below the wind' [i.e. E. of Ceylon] and on the coasts of China. But those ports and cities have disappeared or their names have changed: they are therefore no use at all to our time, which has derived truth from our science and experiences and discoveries, as set forth in this book." Ibn-Mājid does not fail to emphasize the superiority of his own "Instructions." They were based on the work of his father and grandfather and improved by many years of his own experience as a captain. His *Kitāb al-Fawā'id* or "Book of Benefits" is indeed most valuable, and Ferrand declared that his description of the Red Sea, apart from rectifications of latitude, has never been equalled by any European "Instructions" for sailing boats.[108]

The magnetic needle was known in China from ancient times. But there is no record of its nautical use as a compass before the end of the eleventh century, when it is mentioned as being used on Arab and Persian ships trading between Canton, Sumatra and India. The earliest European mention

[108] Maqdisi, pp. 10-11 (quoted); Aḥmad ibn-Mājid, *Kitāb al-fawā'id*, fol. 3v ff. (quoted). The full title is *Kitāb al-fawā'id fi usūl 'ilm al-baḥr w-al-qawā'id*: Bibliotheque Nationale, MS. 2292, reproduced photographically by Ferrand in *Le pilote des mers de l'Inde et de la Chine et de l'Indonesie* (Paris, 1921-23). See Ferrand, *Astronomie nautique*, pp. 175-255; "Shihāb al-dīn" in *Enc. Islam*; "L'element persan" etc. in *J.As.* (1924); J. Sauvaget, "Sur d'anciennes instructions nautiques arabes pour les mers de l'Inde," in *J.As.* (1948).

is in a French poem of Guyot de Provins, c. 1190; in the thirteenth century there are several references in French, Arabic, and other literatures. Thus it is probable that the use of the magnetic needle as a mariner's compass was transmitted from the Far East to the Mediterranean by the Arabs, in the age of the Crusades. But in the Far East and the Indian Ocean it never played more than a subordinate part in navigation, because of some technical defects and still more because it was not found necessary under the clear tropical skies where the celestial bodies nearly always gave sufficient guidance. It was only under the clouds of the North that it was eagerly made use of, as one more technical improvement making possible the voyages of the great discoverers.[109]

Shore-sighting pigeons were also employed in some parts of the Indian Ocean: Pliny mentions them as used by the Singalese in the first century A.D., because they had no nautical astronomy; a Chinese source of the ninth century refers to them on Persian ships.

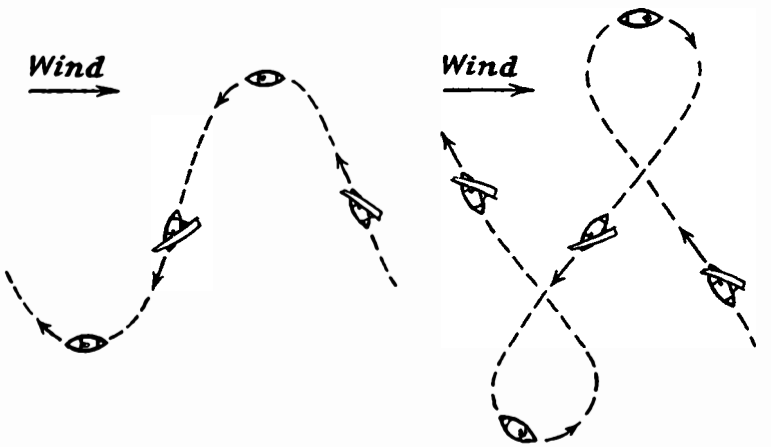
It can be assumed that Arab ships could go on the tack, for that is practically the *raison d'être* of the lateen sail. But they must have done this in the same manner as modern Arab craft, by wearing round, stern to wind, instead of tacking straight across the wind. With such a tall mast and sail, it is dangerous to allow the sail to be taken aback, as it must in tacking; it has to be carefully turned before the mast, and this involves wearing round.

There was no reefing of sails in a strong wind, but the yard could be lowered, as today, and it is probable that a spare yard and sail of smaller size were carried, as in the

[109] L. de Saussure, "L'origine de la rose des vents," etc. in *Astronomie nautique*. Baylaq al-Qibjaqi, *Kitāb ḳunz al-tujjār* (Bib. Nat. MS. 2779), quoted by de Saussure, pp. 80-84; copied by Maqrizi, *Khiṭaṭ* (Būlāq, A.H. 1270), vol. I, p. 210. Gildemeister, in *Göttinger Nachrichten* (1882). Technical defects of the magnetic needle in the medieval Indian Ocean: (i) It was floated on water; before the invention of the dry needle on a pivot it was not possible to determine any direction accurately from a center. (ii) For the same reason the needle could not be mounted on a windrose. (iii) Methods of magnetization were weak.

vessels seen by Colomb in the nineteenth century. In a storm the most drastic action might have to be taken: the top-heavy mainmast might be cut and thrown over, as well as anchors and cargo, and the ship left to ride out the storm. The extreme measure was, of course, to take to the boats.[110]

FIG. 2. TACKING AND WEARING



A rough idea of sailing speeds can be gained from the table, on the following page, of voyages recorded by Arab writers. Although each of these figures may contain some inaccuracy, taken together they present a fairly constant result: that a normal speed was between two and four knots. On the record run from Kalah Bār to Shiḥr Lubān, mentioned by Buzurg, an unknown length of time must have been spent at anchor at the Nicobar Islands and Kūlam Malī; therefore we can probably estimate sailing speed on this occasion at four or five knots at least. These speeds are slow in compari-

[110] On shore-sighting pigeons: Pliny, *N.H.*, bk. VI, ch. 24; *Chau Ju-Kua*, introd., p. 28. On tacking and wearing: Villiers, pp. 40-41; Bowen, pp. 35-43. On reefing and storms: Colomb, *Slave-catching*, pp. 36-38; Mas'ūdi, *Murūj*, vol. I, p. 234 ("the great sail"); Buzurg, pp. 44-47, 87-88, 165-68; ibn-Baṭṭūṭah, vol. IV, pp. 185-86.

AUTHOR	VOYAGE	DAYS	NAUTICAL MILES (APPROX.)	SPEED IN KNOTS (APPROX.)
Akhbār, §§ 13-16	Masqaṭ to Kūlam Malī	c.29	1450	2.1
" "	Kūlam to Kalah Bār	c.29	1580	2.3
" "	Kalah to Tiuman I	10	510	2.1
Ibn-Khurdādhbih pp. 66 sqq.	Nicobar Is. to Kalah	6	400	2.8
Al-Maqdisi, p. 215	al-Qulzum to Juddah	25 (min.)	630	1.1
	(anchoring at night)	60 (max.)		0.4
" p. 426	Sīrāf to al-Baṣrah	5 (min.)	320	2.7
		10 (max.)		1.3
Buzurg, pp. 91-92	Off Kūlam? to Raysūt	c.16	1250 (min.)	3.2
" p. 130	Kalah to Shiḥr Lūbān	41 (record time, prob. with stops)	3300	3.4
Al-Marwazi, ch. 8, § 34	Day's voyage with fair wind	1	150	6.2

son not only with those of European sailing craft since the Renaissance, but even with those of Greek and Roman merchant vessels, which often attained six, seven, or eight knots. A good modern Arab vessel is fast enough; it easily makes ten knots. If the time spent at anchor by the medieval ships were ever recorded, we should be able to form a much better estimate of their real sailing speeds.[111]

The organization of a voyage is described in the Fifth Voyage of Sindbad in the *Arabian Nights*. Sindbad says, "I was again seized with the longing to travel and to see foreign countries and islands. Accordingly I bought costly merchandise suited to my purpose and, making it up into bales, repaired to Bassorah, where I walked about the river-quay till I found a tall fine ship, newly builded with gear unused and fitted ready for sea. She pleased me; so I bought her and, embarking my goods in her, hired a master and crew, over whom I set certain of my slaves and servants as inspectors. A number of merchants also brought their outfits and paid me freight and passage-money; then, after reciting the Fatihah we set sail over Allah's pool in all joy and cheer, promising ourselves a prosperous voyage and much profit." It could not have been usual for a merchant to buy an entire ship and sail with it in this impromptu fashion. But it seems that the *nawākhid* or shipmasters were themselves often

[111] I have ignored passages containing great obscurities about locations, etc., also voyages which are not typical, as that of ibn-Jubayr, pp. 72-75, from 'Aydhāb to Juddah. Ibn-Jubayr's boat took seven days to cover 115 miles, owing to storms and reefs.

References are given in the text. These are straight runs, except Buzurg, p. 130, Kalah to Shiḥr Lūbān, where we must assume stops at the Nicobar Islands and Kūlam, at least long enough to take on water. Maqdisi, p. 215, gives the shortest and longest times for the voyage from al-Qulzum to Juddah; sixty days seems excessively slow, but we must remember the difficulties of this sea and the necessity of anchoring at night. In Buzurg, pp. 91-92, the distance is given—"at least 400 *farsakhs*," i.e. 1,245 nautical miles if the *farsakh* was 6,305 yards.

E. de Saint-Denis, "La vitesse des navires anciens," in *Revue archéologique*, vol. XVIII (July-September 1941), pp. 121-38.

merchants, not captains. The captain of a ship was called *rubbān*.[112]

Sea voyages in those days were full of hardship. To begin with, the ships were often overcrowded. Ibn-Jubayr complains of the conditions endured by the pilgrims crossing from 'Aydhāb to Juddah. Buzurg mentions three very large ships carrying an average of 400 persons aboard, and such a figure would be impossible on even the largest of Arab craft without serious overcrowding by modern standards. This is still typical of these boats at the present day. Anyone who has traveled on a country bus in the Near or Middle East will be able to imagine conditions aboard these vessels, and to understand the commercial motives and lack of legal restrictions which produce such conditions.

Then there were lengthy stops in the hot, humid ports, where the ship was at the mercy of the local ruler; expensive port dues and presents had to be paid, and there would often be forced stays ending only when the possibilities of trade were exhausted. On the ocean, storms, reefs, and shallows were ever-present perils; captain and crew felt only slightly less helpless than the merchants; in the midst of huge waves man was indeed "a worm on a splinter." Add to this the terrible danger of pirates in their oared vessels, much faster in calms and light winds than any ship relying on sail alone; these could be repelled only by the action of fire-throwing marines carried aboard, except in the rare waters where a ruler kept a navy to safeguard shipping. Marco Polo says that the pirates of Gujerat formed cordons of twenty to thirty ships at intervals of five or six miles, signalling to

[112] *Arabian Nights*, no. 556 in R. Burton's translation, vol. VI, p. 48 (quoted). Descriptions of places and ships in the *Arabian Nights* are too vague to be of great value for our purpose. It is to be noted that Sindbad was a merchant, not a sailor. On modern organization: A. Villiers, *Sons of Sindbad*, pp. 296-97, and "Some Aspects of the Arab Dhow Trade," in *Middle East Journal*, vol. II (October 1948), pp. 399-416; the modern captains of al-Kuwayt are called *nawākhid* and nominally own their ships, but in fact they are in financial leading strings to the merchants.

each other by fire or smoke. In the midst of all these troubles, mariner and merchant called readily upon God for help, and the narratives of the sea are full of His name.[113]

In order to give a more vivid picture of life at sea, I conclude this account with a translation of four narratives from Arabic authors, describing voyages made in medieval times.

APPENDIX TO CHAPTER III: FOUR SEA-STORIES

(1) 'ABHARAH'S SEAMANSHIP (BUZURG, PP. 85-90)

Among the yarns of seamen [*al-baḥriyīn*] and shipmasters [*al-nawākḫidhah*] is that which is told about Captain [*al-rubbān*] 'Abharah. He was originally from Kirmān, a shepherd in one of its districts, then he became a fisherman, then one of the sailors [*al-bānāniyah*] on a ship trading with India. He then changed to a China ship [*marḳab Ṣīni*], of which he afterwards became captain. He was well versed in the ways of the sea and made the voyage to China seven times. No one had crossed to China before him except as a perilous adventure. No one had ever been heard of who had made the voyage without accident and returned: if anyone made the outward voyage safely, that was a wonder, and a safe return was rare; and I have never heard of any but him who made both the outward and the return voyage wholly without mishap.

He was on one occasion found sitting in his canoe [*mityāl*] with a water-skin, and remaining on the sea some days. What

[113] On overcrowding: ibn-Jubayr, p. 71; Buzurg, p. 165; Villiers, p. 60. On forced stops and tolls: *Aḫbār*, sec. 11; ibn-Baṭṭūṭah, vol. IV, p. 79. On storms and reefs: Buzurg, *passim*; ibn-Jubayr, pp. 72-75; ibn-Baṭṭūṭah, vol. IV, pp. 185-86; Balādhuri, p. 431 (quoted); etc. On pirate ships: Ṭabari, vol. III, p. 1582, describes *bawārij* attacking al-Baṣrah in 866: each vessel has a pilot (*ishtiyām*), three fire-throwers (*naffātūn*), a carpenter, a baker, and thirty-nine rowers and fighters: total complement forty-five. Marco Polo (Yule), vol. II, p. 389. On warships: ibn-Baṭṭūṭah, vol. IV, pp. 59-60, describes an Indian warship as having sixty oars, another as having fifty rowers and fifty Abyssinian men-at-arms; a roof protects the rowers in battle against arrows and stones. See Gildemeister. On religion at sea: Barthold, "Der Koran und das Meer," in *Z.D.M.G.*, n.s. vol. VIII (1929); Gildemeister; ibn-Jubayr, pp. 72-75; ibn-Baṭṭūṭah, vol. I, pp. 39-44, vol. II, pp. 90-91.

follows is related by Captain Shahriyāri, one of the captains on the China route:

"I was sailing from Sīrāf to China, and was between al-Ṣinf and China in the region of Sandal Fūlāt—an island at the entrance to the Sanji sea, i.e. the sea of China—when the wind dropped to a calm and the sea became still: we let out the anchors [*taraḥna al-anājir*] and rested where we were a couple of days. On the third day we sighted in the distance something on the sea. I let down the dinghy [*al-dūnīj*] into the sea with four sailors and ordered them, 'Make for that black object and see what it is.' So they went and returned and we asked, 'What is it?' and they said, 'Captain 'Abharah in his canoe with a water-skin.' I replied, 'Why did you not bring him?' They said, 'We tried; but he said, "I shall only enter your ship on condition that I become captain in command of the vessel and am paid goods to the value of 1000 dinars at Sīrāf prices. Otherwise I shall not enter."' When we heard this report we were struck by his words. I went down with some others from the ship to where he was being tossed up and down by the waves; we hailed him and begged him to come up with us. But he said, 'Your situation is worse than mine, I am safer than you. But I shall go up if you pay me goods to the value of 1000 dinars at Sīrāf prices, and give me command of the ship.' Then we said, 'This ship holds a great quantity of goods and valuables and many people, and it would do us no harm to have the advice of 'Abharah for 1000 dinars.'

"So he came up into the ship with his canoe and his water-skin. As soon as he was aboard he said, 'Deliver me the 1000 dinars' worth of goods'; and we delivered them. Then, when he had put them in a safe place, he addressed the captain, 'Sit aside!' and the captain moved from his station. Then he said to us, 'It is your duty to carry out your orders thoroughly while there remains a chance.' We said, 'What shall we do?' He said, 'Throw out all heavy cargo,' so we threw out about half the ship's freight, or more. Next, 'Cut the larger mast [*al-daqal al-akbar*],' and we cut it and threw it overboard. In the morning he ordered us to take up the anchors and let the ship drift, which we did; then to cut the cable of the large anchor, which we did also, leaving it in the sea. After that he ordered us to do the same with other anchors,

and continued until we had thrown six anchors into the sea. On the third day a cloud rose up like a lighthouse, and dissolved again into the sea; then the typhoon [*al-ḳhabb*] was upon us. And if we had not jettisoned the cargo and cut the mast we should have been sunk by the first wave that struck us. The typhoon lasted three days and three nights, with the ship tossing up and down without anchor or sail [*shirā'*], drifting we knew not whither. On the fourth day the wind began to abate; then it died down altogether and the sea was fair at the end of the day. From the morning of the fifth day the sea was good and the wind favourable [*mustaqīmah*]; we erected a mast, hoisted the sails and went on our way, preserved by God. We arrived at China, and stayed there until we had sold and bought, repaired our ship, and made a mast to replace the one we had thrown overboard. Finally we left China and made for Sīrāf.

"When we came near the place where we reckoned we had first seen 'Abharah, we passed by an island and some reefs. 'Abharah said, 'Drop the anchors'; and we did so. Then we let down the life-boat [*al-qārib*] and fifteen men went into it, with orders from 'Abharah to go to a certain reef which he pointed out and fetch from it a certain anchor. We were surprised by the order, but did not dispute it; so the men went and returned with the anchor. Again he ordered them to go to another reef which he pointed out and bring back a certain anchor, and they went and returned with it. [A third anchor should be mentioned here.] Then he ordered the sails to be hoisted, and we hoisted them and sailed on.

"We asked him, 'How did you know about those anchors?' He replied, 'Yes, I shall explain. When I found you in this place it was exactly the thirtieth day of the moon, at the time of high tide. But the water had already ebbed considerably, and you were between the reefs and the island. So I ordered you to throw out the heavy cargo, and you did so. I then thought about the anchors, and realized that we should not need them urgently in China and that the value of an equal weight of the remaining cargo was double the value of the anchors; so I threw them out as well because it was absolutely necessary to lighten the ship. These three anchors remained visible above the reefs and the island, while

the other three sank under the water.' 'But,' we asked, 'what indication did you have of this ebb and the typhoon?' He answered, 'I and others before me have had experience of this sea, and we have discovered that on exactly the thirtieth day of every moon there is a large ebb which uncovers these reefs. Moreover at the time of this ebb there is a violent typhoon which arises from the depths of the ocean. The ship on which I was had been wrecked on the crest of one of these reefs, because the ebb had caught me while I was lying at anchor for the night over the reef; but I saved myself in that canoe. And if you had stayed where you then were, you would not have remained on the sea more than an hour without your ship being grounded, before the typhoon, because you were over the island; and if you had run aground on it you would have been wrecked.' "

This 'Abharah was a man of many voyages and adventures on the sea, and this is one of his strangest adventures.

(2) HEADING FOR RAYSŪT (BUZURG, PP. 90-92)

Muḥammad ibn-Bābishād narrated to me an incident which occurred once when he was sailing in his ship from Fanṣūr making for 'Umān. After he had crossed the Sea of Harkand and entered the Sea of India, and resolved to cross to the West, the captain of his ship [*rubbān markabihi*]* said to him, "What port in the West are you making for?" He replied, "I am making for Raysūt or a *farsakh* above or below it." The captain said to him, "We are heading for a certain port fifty *farsakhs* below Raysūt." So they made a wager of twenty dinars, to be given to the poor. At the time they were at least 400 *farsakhs* distant from Raysūt.

After fifteen days' sailing they thought they were now approaching the mountains of the West, and began talking about their wager until nightfall. They sailed on till the next morning, and when the day broke they climbed up with the look-out boy [*al-dīdbān*] to the top of the mast [*ra's al-daqal*], but saw nothing and descended. But when they had performed the afternoon prayer, Muḥammad ibn-Bābishād said, "I can see an outline of

* As distinct from himself, the shipmaster (*nākhuda*). See Buzurg p. 5 on this Muḥammad ibn-Bābishād, a famous shipmaster.

the mountains." But the others said, "We see nothing." So he told the boy to climb up, and when he had climbed and set himself on top of the mast, he cried, "The mercy of God on those who magnify Him!" So they magnified God and congratulated each other and wept from the intensity of their joy and happiness. Then they went on for the whole of that night until near the dawn, and when the dawn was nearly rising Muḥammad ibn-Bābishād said, "Drop the anchor," and they did so, and lowered the sail. Then he said to the captain, "Where are we?" and the captain told him they were off a certain place, which was forty *farsakhs* distant from Raysūt. But Muḥammad ibn-Bābishād replied, "No, we are at Raysūt itself: either it is on the shore just opposite the ship, or an arrow's throw ahead or astern." And sure enough when morning came they were at Raysūt itself.

Muḥammad ibn-Bābishād added, "If you are on the sea and you want to know whether you are near the land or a mountain, look out in the afternoon when the sun is going down; if when it goes down there is actually a mountain or island on the opposite horizon, it will be visible then."

(3) SHIPWRECK ON THE WAY TO INDIA (BUZURG, PP. 165-68)

Among the famous adventures of the sea which have been handed down by tradition to our own times is the following, told to me by a merchant:

"I left Sīrāf in the year 306 [A.H., that is A.D. 919] in a ship making for Ṣaymūr. With us was a ship of 'Abdallah ibn-al-Junayd and a ship of Saba. These three ships were extremely large and well known on the sea, with famous shipmasters of high repute and standing among seamen. Aboard the ships there were 1200 men—merchants, shipmasters, sailors, and others, of diverse nationalities. The cargo of wealth and merchandise was of incalculable value. After eleven days' sailing we saw the outlines of the mountains and the features of the land of Sindān and Tānah and Ṣaymūr. We had never heard of this voyage being made with such speed before, so we rejoiced and congratulated each other on our safe crossing, and we began preparations [for landing] because we presumed we should reach land next morning.

"But then the wind came upon us from the mountains, and we could not handle the sails, and we were caught in the gale [*al-ḳhabb*] and the rain and thunder and lightning. The ship's officers [*al-rubbāniyah*] and sailors proposed to jettison cargo, but Aḥmad [the master of our ship] forbade them saying, 'I shall not jettison until after things are beyond my control and I know that I shall perish.' So the men went down to bail out the hold [*al-jummah*] on both sides. The other two ships were in the same condition as ours, with everyone aboard waiting on the master [*sāḥib*] to see whether he would jettison or not, and following his example. Then the merchants [on our ship] started fretting and said to him [Aḥmad], 'Throw out the cargo, you will not be held responsible; for we are perishing.' But he refused absolutely. For the next six days matters grew steadily worse. On the sixth day when the ship was almost sinking he gave the order to jettison; but it was impossible to throw out anything because the sacks and bales were heavy with the rain, so that what had contained a weight of 500 *manns* now contained *1500* because of the rain. The situation was now urgent; the life-boat [*al-qārib*] was put on the water and thirty-three men went down into it. Aḥmad was pressed to go down into the life-boat, but he said, 'I shall not leave my ship, for there is more hope of its being saved than the life-boat; and if it goes down, I go down with it, for I have no interest in returning after the loss of my capital.'"

The merchant who told me the story went on:

"We stayed in the life-boat five days without food or drink, until we had not the force to speak a word, from hunger and thirst and our sufferings on the sea. The boat was so tossed by waves and wind that we did not know whether it was under the sea or not. And in our intense hunger and distress we made signs to each other that we should eat one of our number. There was among us in the boat a fat boy, not yet of age, whose father was in the company that had remained behind on the ship: so we decided to eat him. The boy felt what we were up to, and I saw him looking up to heaven and moving his lips and his eyes in silent prayer. But in less than an hour we saw signs of land. Soon the land became clearly visible; then the boat ran aground, capsized and filled with water. We had no strength to stand or

move. But at that moment behold! two men running down from the shore to the boat. They asked us where we came from; we told them from a certain ship, which we named. They took us in their arms and brought us ashore. There we fell on our faces as if we were dead. One of the two men ran away; I asked the other where we were and he answered, 'This smoke which you see is from al-Tīz. My companion has gone to the village, where we have food and water and clothing.' Then they carried us to the town.

"Everyone on board the three ships perished, and not one of them was saved except a handful of those who were in the life-boat. Among the victims was the captain [*al-rubbān*] of our ship, Aḥmad, whose name has remained celebrated. The loss of these ships and their cargoes of goods contributed to the decline of Sīrāf and Ṣaymūr, because of the great quantity of wealth and the number of important shipmasters and captains and merchants in them."

(4) CROSSING FROM 'AYDHĀB TO JUDDAH (IBN-JUBAYR, PP. 72-75)

On Monday the 25th of Rabī' al-Awwal, i.e. the 18th of July [25th of July Gregorian calendar, A.D. 1183], we embarked on the *jalbah* for the crossing to Juddah. We stayed that day in the anchorage because of the calmness of the wind and the absence of the sailors [*al-nawātiyah*]; and on the morning of Tuesday we set sail, with the blessing of God the Great and Glorious and the benefit of His much-desired help. . . .

On Tuesday the 26th of Rabī' al-Awwal, and on Wednesday, our sea voyage continued with a gentle breeze blowing. But in the late evening of the night before Thursday, while we were rejoicing at the sight of the birds circling above us from al-Ḥijāz, a flash of lightning shone from the direction of that land, i.e. from the East. Then there began a rain-storm with which the horizon was darkened, and soon it covered all the horizons; and a strong wind blew which pushed the ship off its course backwards. The gale wind continued and the intense darkness increased and enveloped the horizons, and we did not recognize the direction we were making for until some stars appeared and

some indications could be got from them. The sail was lowered to the foot of the *daqal*,* i.e. the mast (*al-ṣāri*); and we stayed that night on a rough sea which led us to despair. But after the Red Sea had shown us some of its tempestuous rage, God brought relief with the morning. The wind was curbed, the clouds dispersed, the sky cleared, and al-Ḥijāz appeared to us in the distance. We could only see some of its mountains to the East of Juddah; the *rubbān*, i.e. the captain [*al-ra'īs*] asserted that between those mountains which appeared to us and the site of Juddah was a distance of two days [journey on land]. May God smooth out for us every obstacle and make easy for us every difficulty with His greatness and kindness!

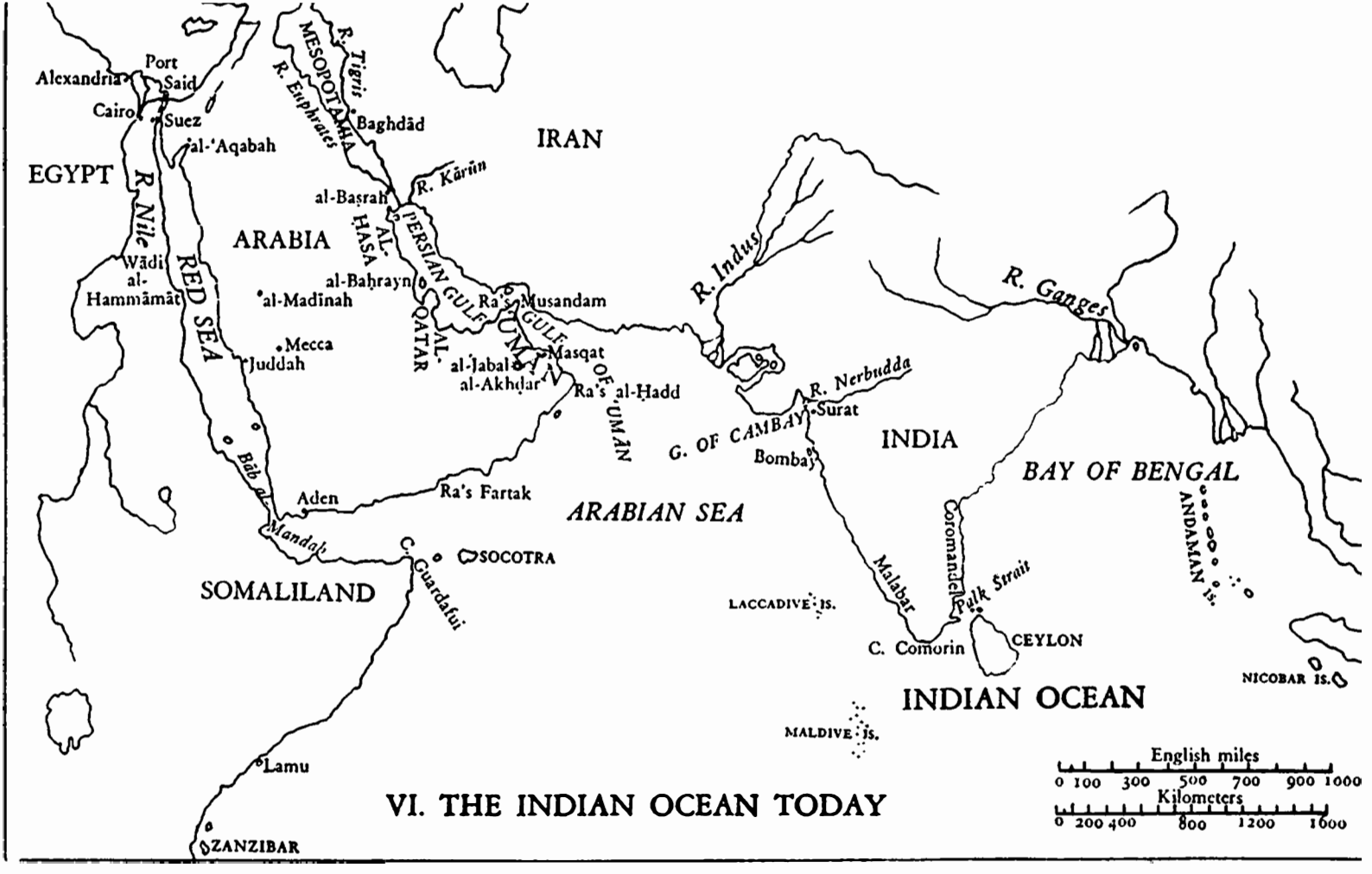
We sailed that day, Thursday, in a soft and pleasant wind; then in the evening we anchored at a small island in the sea near that land which we mentioned, after we had passed much coral on which the water was breaking, and mocking (or sparkling?) at us [*yaḍḥak 'alaina*]. We penetrated its reefs with the utmost caution; the captain was intelligent and skillful at his craft, and God delivered us from the reefs, until we anchored at that island. We went ashore and lodged there on the night before Friday, the 29th of Rabī' al-Awwal. In the morning the weather was calm, and the wind was breathing only from the opposite direction to that which suited us, so we spent Friday there. On Saturday, which completed the thirty days of the month [1st of Rabī' al-Ākhir], the wind blew somewhat; we sailed with that wind gently, while the sea became so still that you might imagine it was a plate of blue glass. . . .

On the evening of Sunday the 2nd we anchored at an anchorage called Abḥar, less than a day [by land] from Juddah. This anchorage has a most wonderful situation, for it is a channel of the sea entering into the land, which surrounds it on both sides; the *jalbahs* anchor there in a calm and quiet spot. At dawn on Monday we sailed from it with the blessing of God the Highest in a mild breeze. It is God who gives success; there is no Lord but He. When the night darkened we anchored near Juddah, which

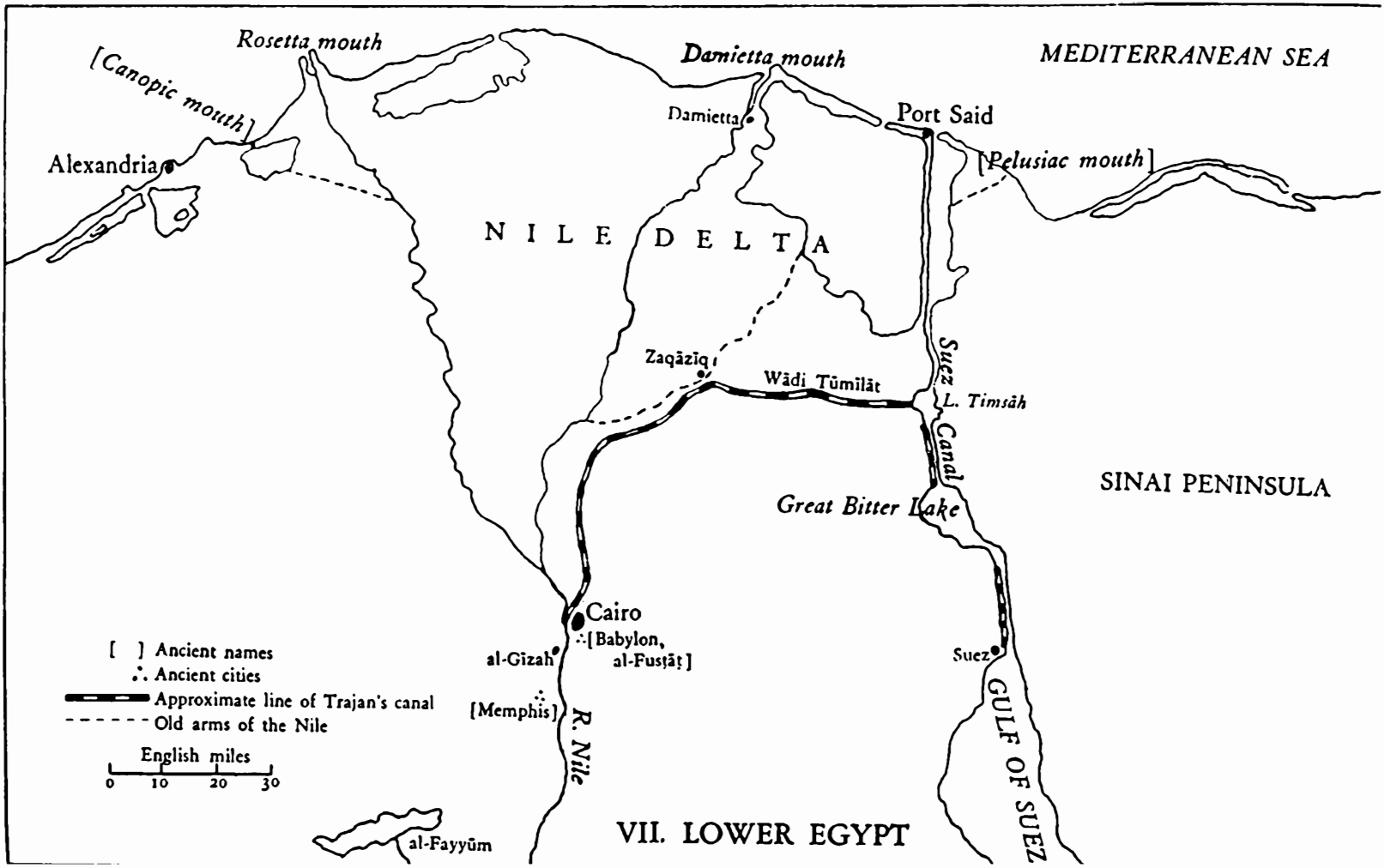
* Ibn-Jubayr was a pilgrim from Spain. He and his readers there were familiar with the nautical vocabulary of the Mediterranean, so he takes pains to explain some of the terms in use on the Indian Ocean.

was within sight. On Tuesday morning the wind was blowing against our entry into its harbour; the entry of these anchorages is in any case difficult to accomplish because of the numerous coral reefs and the winding channels: so we were able to see the art of these captains and sailors in managing the *jalbah* among them; it is extraordinary how they bring it through the narrow channels and lead it among them like a rider on a horse which is sensitive to the rein and easy under the bridle; and in this they show marvellous skill, difficult to describe. At noon on Tuesday the 4th of Rabī' al-Ākhir, the 26th of July, we entered Juddah, praising God. . . .

[Among the dangers of the voyage, ibn-Jubayr mentions] the weakness of the ship's tackle, its derangement and breaking time after time when the sail was raised or lowered or an anchor drawn from its moorings; and sometimes the ship's hull struck one of the corals during its passage among them, and we heard a crashing sound which caused us to despair; and sometimes we did not know whether we should live or die. . . .



VI. THE INDIAN OCEAN TODAY


Rosetta mouth
[Canopic mouth]
Damietta mouth
MEDITERRANEAN SEA
Damietta
Port Said
Alexandria
[Pelusiac mouth]
NILE DELTA
Zaqāzīq
Wādi Tūmīlāt
Suez
L. Timsāh
Canal
SINAI PENINSULA
Great Bitter Lake
Cairo
[ ] Ancient names
∴ Ancient cities
Approximate line of Trajan's canal
Old arms of the Nile
English miles
0 10 20 30
al-Gīzah
∴[Babylon, al-Fusṭāṭ]
Suez
[Memphis]
R. Nile
GULF OF SUEZ
al-Fayyūm
VII. LOWER EGYPT

INDEX OF NAMES