Sailing the Red Sea: ships, infrastructure, seafarers and society

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Abstract

Sailing along the coast reinforces the benefits of long-established Indian Ocean monsoon and trade patterns that extended into the Red Sea. Vastly profitable and culturally significant expeditions and fleets channelled people and exotic animals from giraffes to elephants, Chinese porcelains, coffee, incense, textiles and other goods into a durable, if episodic, infrastructure of coastal sites in a pattern that endured for thousands of years. The acquisition and influx of exotic materials established economic and social interactions illuminated by recent archaeological exploration of anchorages, harbours, shipwrecks and other installations. New data from Red Sea sites offer a basis for examining the development of extensive maritime systems from the middle of the third millennium BCE through the early modern era.

Key words: Red Sea, pharaonic ships, porcelain, incense, coffee

Introduction

The hospitable island of Malta in the midst of a narrowing of the Mediterranean Sea is a particularly appropriate place to consider maritime ethnography with a focus on the people who began to venture across the seas thousands of years ago. We know about them by the things they left behind: the material culture that preoccupied Fernand Braudel (d. 1985) and still fascinates archaeologists who also seek the internal structures of belief, of mental knowledge, and of the impact of these upon one’s cultural perspective. The innovative approaches described here are particularly appropriate for Red Sea studies, whose recent expansion provides the opportunity to establish a framework that incorporates tangible and intangible worlds.

A significant advantage of working on, under and beside the sea is that it reminds us to make use of our unique perspective and to view the land from the sea. More than half the world’s population lives within 50 km of a coastal region: whether sea, ocean, lake or river, these are vital zones for economic and social structures.

The Indian Ocean and its western extension, the Red Sea, are among the most ancient waterways traversed by humans. Recent analyses suggest that human expansion of Africa more than 100,000 years ago likely incorporated some form of water transportation, possibly across Bab el Mandeb. Unlike voyages in the greater Indian Ocean, travel on the Red Sea seems to have been coastal, like that in the Mediterranean, but with some crucial differences that reflect patterns of human settlement, economies, politics and geography. Despite its significance and antiquity, we know relatively little about the Red Sea.

Recent archaeological studies of harbour towns that line its shores offer brief glimpses of complex relationships and permit a tight focus on particular slices of time, but we are still far from attaining a comprehensive approach to studying the Red Sea, though our database of sites, shipwrecks and material culture from local, regional and exotic locales is growing rapidly.

The focus of this paper reflects a decidedly maritime archaeological approach to an ancient anchorage of the third millennium BCE and an early modern shipwreck, a vessel owned and operated by Muslims, laden with a cargo intended for the Muslim market, and voyaging just before European ships were allowed north of Jeddah to trade directly at Suez. The Red Sea trade was vastly profitable in terms of material returns from incense, acquisition of down-the-line goods from East Africa or the Indian Ocean, passenger transport at times, and coffee sometime after the fifteenth century. Its passage also offered intangible indicators of success and accomplishment within society, whether in displays of pharaonic power over distant lands or in the pious journeys of Muslims fulfilling the religious expectations of pilgrimage.

To sail the Red Sea was to participate in a resource intensive system – a system that had to import wood and materials for building here any vessel larger than a canoe while at the same time maintaining the knowledge of safe anchorages, waypoints and landmarks, currents and winds on a body of water travelled rather infrequently in comparison to Mediterranean practices. Until late in its history, the Red Sea saw little year-round residency or voyaging, but people have always lived along its shores.

In the Red Sea, the pattern of sporadic occupation and abandonment of harbour towns recalls that of some islands elsewhere. It also may overwhelm our awareness and study of more mobile groups of fishers, hunters and farmers whose presence extends far beyond chronological markers as well as geographical boundaries. These are the peoples who always maintained a connection to the sea.

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while residents of sequentially occupied towns such as those on Egypt's coast, as well as of the virtual island of Jeddah, remained chronically dependent on inland sources for basic supplies. Each harbour town looked to the sea, but long-established land routes and administrative practices linked it directly to the hinterland and 'civilization' despite being immersed in a richly-furnished material world populated by the exotic, including personnel and objects, as a result of long-distance maritime commerce.

Another aspect of any nascent framework for the study of the Red Sea encompasses the world of human perception (Fig. 1). How did the sailors and harbour administrators, the merchants and their families, perceive this maritime space? Did national or ethnic or individual identities play a major role in establishing a meme for conceptualisation of the sea before the introduction of Islam? At Quseir al-Qadim, on the Egyptian coast, six written languages and several ethnicities reinforce the intercultural atmosphere of the Roman period. What was the impact of Islam on this space? Historic texts inform us that Christians, Jews and Muslims worked together and beside one another long before Europeans arrived, in order to harness the economic opportunities of travel and trade on the Red Sea, practices affirmed by archaeological investigations by Donald Whitcomb, David Peacock, Lucy Blue, Masuto Kawatoko, Willeke Wendrich, Steven Sidebotham and others, yet what relationships did the acts of building, operating and voyaging in ships engender? Did these relationships differ from those related to daily life in these coastal towns?

At every harbour under excavation, the combination of prosaic and phenomenal visible material details drive home the importance of these questions. Japanese excavations since the mid-1990s under Masuto Kawatoko document life at Raya on the Sinai Peninsula (sixth-twelfth or thirteenth centuries), Al-Kilani at Al-Tur just north of Raya (thirteenth century until today), and further south on both sides of the Red Sea at Aydhab (tenth to fifteenth centuries) near the Sudanese border with Egypt,

Fig. 1: Coastal settlements on the Red Sea shores depend on support from the mainland as well as contact with the wider world by sea. Active geological processes affect the area by shifting water sources, and settlement patterns reflect periods of abandonment, ephemeral occupation, and stable populations (map C. Ward).

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3 Written languages at Quseir include Greek, Latin, demotic Egyptian, Tamil, Nabatean and South Arabian according to D. Whitcomb, 'Quseir Al-Qadim and the Location of Myos Hormos', *Topoi*, 6 (1996): 747-772.

at Badi (seventh to twelfth centuries) near the Ethiopian border with Sudan, and at the Saudi port of Al-Jar near Yanbo on the eastern coast. The salvage nature of many of these projects has delayed publication, but some general information and specialised reports provide the brief descriptions that follow.\(^5\)

The town of Raya, south of Al-Tur in Sinai, is on the edge of a partially filled-in mersa or bay. Like many other sites in Egypt, its inhabitants took advantage of a standing structure, in this case a well preserved sixth-century fort, and transformed it into a village with numerous public buildings, the oldest mosque recorded in Sinai, and many multi-story homes in a residential quarter built of local materials such as coral blocks and mud-brick. A grid pattern for the layout of streets in the former fort reflects that of other early Islamic towns. Nearly undisturbed since its twelfth-century abandonment, the site produced what Kawatoko describes as significant quantities of high quality ceramics, glass, manuscripts, copper and other artefacts, including some small pieces of early Chinese porcelains.\(^6\)

Perhaps founded after sedimentation limited access to Raya, Al-Kilani as Al-Tur’s link to the pilgrimage to Mekkah is reflected in more than 12,000 artefacts that include a high proportion of pilgrims’ flasks for the waters of the holy spring of Zamzam near Mekkah. But abundant finds of square incense burners with horned corners from Oman and Yemen in its earliest levels (fourteenth to eighteenth centuries) reflect its even stronger links to maritime commerce. Glass bracelets from India, porcelain from Jing-de-zhen and Lung-chuan in China, as well as other finewares from Thailand, Myanmar and Vietnam are common across the site and seem to have been used in the city residences. No local Egyptian wares were identified; even coarseware for food storage and preparation was imported. Iznik pottery from Turkey, faenza from Italy, lusterwares from Andalusia, sgraffito from Cyprus and non-Egyptian glass (probably Syrian and Iranian) attest to broad interconnections of what was only a 200 x 400m village on the edge of the Red Sea’s Sinai coast.\(^7\)

In addition, more than 4,000 Al-Kilani manuscripts and fragments date mostly to the early period or mid-nineteenth-twentieth centuries. Personal business documents and receipts include one for a mid-sixteenth century transaction of indigo and a vast store of documents for a family of merchants that describes their ships, their voyages, their exchanges and their colleagues. The manuscripts offer a unique perspective important to our search for the intangible world of early Islam, its development of social and commercial networks, and its relation with Coptic and Byzantine Christians.

In part, this abundance of evidence reflects the arid and stable climate of the littoral region, yet it also reflects extremely limited settlement until about 20 years ago. The story of the past two decades is familiar to anyone who has worked in the Red Sea, and imitates the Mediterranean transformation of a lightly settled, dispersed human network to a pavement of extravagant resorts and desalination plants from one end of Egypt to the other. Less politically stable regions escaped some of this recent development, yet industrial expansion on the Red Sea’s eastern coast also has resulted in significant impacts on both mobile fishers as well as ecological and archaeological resources.

Despite the richness of material culture in these historic period sites, we know little of the impact of the exchange of ideas, of ideology, of the introduction and growing familiarity with ‘the other’ and of the diversity of response to an awareness of the wider world literally washing up on one’s shores, an awareness no visitor to or resident of Malta can forget.

Detecting the links between rice, coconuts and pepper from India at Ptolemaic Berenike, of Chinese porcelains at Raya and Al-Tur in the Sinai, and of Indian cotton sails and teak wood at Roman Myos Hormos/medieval Quseir al-Qadim is relatively straightforward, but defining the meaning of such links and appropriately assessing individual and cultural integration is far more difficult, though inherently at least as important.

Unlike the Mediterranean Sea, the Red Sea does not offer what has become to most archaeologists and historians of the last two decades a comfortable and familiar sense of connectivity, of ships that could stop at almost any point along the coastline within a day’s sail and participate in a comparable cultural and economic system. Although ships regularly sailed its shores, long distance trade rather than local interaction was the rule. Settlements were sparse to non-existent throughout much of the pre-modern era for long lengths of the coastline, and Red Sea towns seem to have existed then primarily to support and receive ships engaged in direct long-distance trade as well as point-to-point sailing to gain access to down-the-line trade as was the situation at Jeddah, for example. At the same time, alternative strategies existed as demonstrated by ethnographic descriptions of a grandfather who owned a fishing boat that sailed south into Sudanese waters from Quseir al-Qadim in the fall to return on the monsoon winds in January, catching and salting away fish constantly for later trade into the Nile throughout the three to five month trip.

Today, like Braudel and his successors,\(^8\) we can examine the deep underlying unity of structure offered by geography and winds, by currents and climates, and change over time up until the arrival of travel by steam rather than the power

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\(^6\) See Kawatoko, Multidisciplinary approaches.

\(^7\) See Kawatoko, *Coffee trade*; Kawatoko, Multidisciplinary approaches.

of air or oars. In this paper, I consider two diverse maritime ventures, one a moment trapped by shipwreck at the cusp of change in the eighteenth century and the other reflecting more ancient interaction and trade patterns that spanned the pharaonic era. Much is omitted; the examples here incorporate the length of the Red Sea and entail its crossing, but in no way provide a comprehensive approach to the culturally embedded patterns of interaction and exchange being revealed by dedicated archaeologists working on both shores and from north to south in the Red Sea.

**Geography, winds, currents and weather**

Predictable sailing routes and conditions are perhaps the most advantageous aspect of Red Sea travel. The Red Sea is about 1,930 km/1,160 miles long and ranges from a maximum 360 km/225 miles wide at Massawa in Eritrea to less than 36 km/20 miles wide at Bab el Mandeb in the south and about 26 km/16 miles wide in both northern arms reaching to Aqaba and Suez. The Red Sea has a surface area of about 438,000 km², roughly the size of the Baltic Sea but less than 15 % of Mediterranean surface. Its waters from turquoise shallows to cobalt blue depths in the abyssal fissure of the meeting of two continental plates was more ancient interaction and trade patterns that spanned more ancient interaction and trade patterns that spanned the pharaonic era. Much is omitted; the examples here incorporate the length of the Red Sea and entail its crossing, but in no way provide a comprehensive approach to the culturally embedded patterns of interaction and exchange being revealed by dedicated archaeologists working on both shores and from north to south in the Red Sea.

The location of ancient anchorages and historic ports, as well as texts from the fifteenth century BCE and the fifth century CE can inform us about some of the patterns in the Red Sea and their continuity over time. None of the ports were used continuously, likely reflecting weather and government and economics as much as periodic shifting of water resources, as at Ayha/Aqaba on the eastern side of the Sinai. In ancient Egyptian times, lusht lagoons filled now-dry wadi months and provided safe haven for nightly stops on their 1,000-mile voyage down the coast to God’s land, or Punt.

The ancient Egyptians, like other sailors of more recent times departing from Egypt, took advantage of steady winds out of the north-northwest, blowing over their shoulders to fill sails and speed their ships down the coast. Departure typically would be in late summer as southerly winds generated by the Indian Ocean monsoons are dominant in the Red Sea south of Berenike in winter on the Egyptian coast and from October to March south of Jeddah. In addition to winds, currents moved from south to north along the Arabian coast, creating a familiar regime for Egyptians who sailed upstream (south) on the Nile with northerly winds and moved downstream (north) with current.

Although the wind and current regime of the Red Sea is well known, some authors suggest that limited sailing north of Jeddah was because conditions were so difficult, basing their opinions on the area not being discussed by western travellers or Indian Ocean navigators. In fact, there are repeated references to the Ottoman state ships, as well as to private vessels, based at Suez in large numbers (30-40 ships in 1700), maintaining what was in essence a monopoly on the lucrative trade from Jeddah into Cairo markets through Suez. The return route was difficult, to be sure, but it was frequently used in historic times. The main staging point for Red Sea crossings from Saudi Arabia today is still at Safaga, midway between the two sites discussed below, because it is there that winds are most favourable for crossings and the distance the shortest.

**The Sadana Island shipwreck, c. 1765 CE**

A mid-eighteenth century ship sank while at anchor in a small bay just north of the fringing reef connecting Sadana Island to the shore, about 14 km north of Safaga, Egypt. Excavated between 1995 and 1998 by the Institute of Nautical Archaeology – Egypt, under the direction of Cheryl Ward, the ship likely displaced some 900 tons and carried a mixed cargo. When we located the ship in 1994, disturbance due to extensive visits by local sport divers was evident in shotted Chinese export porcelain and high-fired earthenware jugs and goblets to hold water (Fig. 2). As we excavated the ship over the next three years, its Muslim crew, northbound cargo of coffee, incense, ceramics, and very construction informed us about the Red Sea just before intensive European engagement there.

While these goods often filled the markets of Cairo, Yemen, central Arabian, and Indian Ocean merchants were not at all common despite the proximity of those regions to Suez and the importance of Egyptian trade to their livelihood. From the 1500s, Egypt’s Red Sea trade focused on the route between Suez and Jeddah. Suez, still a small town of about 1,500 people at this point, was only a 26-hour walk or a 144 km/90 mile camel ride to Cairo. Its broad sea roads, food, and water supported a constant stream of pilgrims to Mekkah who came from the Ottoman Empire and Egypt and met others from Yemen, Arabia, India, and Africa in the middle of the Red Sea. Europeans were rarely

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impossible to tack according to some foreign visitors. Most of these ships were built of wood and iron imported from the Mediterranean through Cairo at Suez shipyards in an indigenous Red Sea tradition unlike any other recorded to date. More than twice as expensive as contemporary Mediterranean ships, perhaps because of the cost of materials, individual Red Sea vessels often were owned by a number of merchants and masters (ra’is) as a way to spread their financial exposure. The earliest records we have date to the late seventeenth century and suggest 50 ships were active then; by 1776, a decade after the Sadana ship sank, only 15-17 ships of its size sailed to Jeddah.13 Outbound cargo might be up to 600 pilgrims or, if the Haj was not during the late spring, staples such as lentils, rice and oils necessary to support the periodically large populations of Jeddah and Mekkah were common.14

On the return trip, half the cargo would likely be coffee, transported by sea up the coast from Yemen because it was nearly 20 times cheaper than sending it overland. For coffee, any freight cost was negligible because a single successful voyage would pay for itself, the ship, and the next coffee cargo.15 Secondary cargoes were less than half as profitable but might include pearls, perfumes, spices, indigo, and particularly muslin and calicos from India in addition to porcelain from China, transshipped to India, Yemen, and Jeddah.16 The annual return of the coffee fleet prompted a race of the fastest camels in Suez to Cairo where, based on the number of sails sighted, coffee futures were traded, continuing a centuries-old practice.17

The Sadana Island ship’s cargo illustrates the variety and wealth of this trade as well as the local origins of the crew.18 Its original cargo likely was predominantly coffee, but foodstuffs aboard equally reflected Mediterranean and Indian Ocean connections. European-style liquor bottles mingled with typical clay pipe bowls associated with Muslim regions and stacks of mother-of-pearl shells from the Indian Ocean lay in a hull built of pine, oak and iron originally from the Mediterranean (Fig. 3). With its southern Red Sea cargo in a hull built of non-local woods, the Sadana ship had much in common with ships of nearly four millennia earlier that sailed the same waters.

Ships traveling between Suez and Jeddah relied on monsoon winds and took about only 20 days to reach Jeddah, but two months to return to Suez. Departures from Jeddah began in mid-March, with convoys of ships arriving until late May. In years when the ships were late leaving Jeddah, they often stopped at al-Tur, at the halfway point in the Gulf of Suez, because it was so difficult to sail against the prevailing winds. European travellers described ships in the trade as quite large, but poorly built.14

The markahs of 900-1000 tons burden were relatively long and deep, quite difficult to manoeuvre, and nearly

13 Niebuhr, Travels through Arabia, and Other Countries in the East, trans. R. Heron, volumes I-II (Reading: Garnet, 1994; first published 1792); Michael Pearson, The Indian Ocean (New York: Routledge, 2005).
14 Niebuhr, I: 326.
17 Raymond, ‘Artisans et commerçants’.
19 Raymond, ‘Artisans et commerçants’.
Red Sea voyagers in the time of the pharaohs

Although a series of reliefs portraying a voyage from Egypt to the southern Red Sea region of Punt from the pharaoh Hatshepsut’s mortuary temple at Deir el-Bahri have long tantalised scholars interested in the question of how, when and where the ancient Egyptians went to sea, little physical evidence of the actual ships existed until recently. Hatshepsut’s five Punt ships provided almost the only evidence for ancient Egyptian seafaring on the Red Sea until excavations at Mersa/Wadi Gawasis uncovered a vast complex for staging and supporting round-trip voyages of up to 3,000 km, probably beginning in the early Middle Kingdom (c. 2022 BCE).21

Excavations at the site, along the edge of the ancient lagoon leading to the sea, identified long galleries carved into an uplifted fossil coral reef (Fig. 4). Some of the first artefacts found in these rock-cut rooms were wooden steering oar blades, stone anchors and cedar ship planks riddled with traces of the destructive activities of shipworms, voracious warm-water mollusc larvae.

Hieroglyphic texts carved on stelae at the site as well as cursive texts on potsherds, combined with the archaeological evidence, let us reconstruct the work cycle. Much of the material dates to the 12th Dynasty (c. 1985-1773 BCE), a period marked by strong rulers who extended Egypt’s presence in the Mediterranean and the Red Sea. Egyptian seafaring expeditions sought luxury trade goods from the southern Red Sea region, but the origins of the ships were in cedars growing on the mountains of the eastern Mediterranean.

Trading and military actions in the region of modern Lebanon and Syria provided the ancient Egyptians with cedar (Cedrus libani) for ships, furniture, statues, coffins, and other finely crafted objects.22 Brought as trimmed and roughly shaped balks (squared logs), the cedar intended for ships would be transported up the Nile to a shipyard such as that at Qubt (ancient Coptos), mentioned in a stela found at Mersa/Wadi Gawasis in the 1970s by Professor Abdel Monem Sayed.23


Because the world’s most ancient assemblage of complex watercraft belongs to the Nile Valley (24 boats dating from 3050 to 500 BCE), the unique methods of hull construction developed in ancient Egypt are recognisable.24 Thick planks, fastened along their edges by thin slips of acacia called tenons, created a sturdy planking shell reinforced by beams at deck level, but almost entirely lacking interior framing. Similar techniques are documented in new excavations at ‘Ayn Sokhna by Patrice Pomey for some 12th Dynasty stored timbers found there.25 At Mersa/Wadi Gawasis, nearly 100 planks and other ship parts conform to this ancient Egyptian technique and provide the earliest evidence for large seagoing ships. The size of the steering oar blades and beams suggests an overall hull length of 20 m.

At Coptos, workers set to work creating ship ‘kits’ consisting of all the planks, beams and other timbers needed to build an entire vessel. Once complete, the ship was taken apart to be carried in pieces across the Eastern Desert. Several thousand men may have transported the ‘kits’ of ships to the seaport at Mersa/Wadi Gawasis, over 150 km away.26

At the seaport, men reassembled the ship kits and fitted each vessel with an immense square sail, probably made of linen, and oars for sailors to use for manoeuvring their ship in and out of port each night. The Hatshepsut Punt reliefs depict five ships, and it is likely that each expedition sent multiple vessels.27 Once the sailors left Mersa/Wadi


26 El Sayed, ‘Discovery of the site’, for discussion of textual information about crew size; Bard and Fattovich, ‘Seaport of the Pharaohs’, for general information about the scale of the site.

27 Rodolfo Fattovich and Kathryn A. Bard, ‘Ships bound for Punt,’ in *The Red Sea in Pharaonic Times: Recent Discoveries along the Red Sea Coast. Proceedings of the Colloquium held in Cairo/Ayn Soukhna, 11-
Gawasis, the work crew may have dispersed for a few months, but when the ships returned from their journey, the site once more became a whirlwind of activity.

Thousands of pieces of wood debris, cordage, linen fragments and ship parts excavated at Mersa/Wadi Gawasis attest to the quick work of dismantling each ship. Some ship timbers were recycled – into thresholds, ramps, and gallery paving (Fig. 5). Even after a three- to five-month long immersion in seawater, the value of the cedar timbers easily repaid the effort to remove barnacles, rotten wood, and other debris. Large copper alloy tools such as adzes and saws, and wooden wedges made on the spot, left their marks on the chips of wood, splintered bits of planks, and the remains of ship fittings in and near the rock-cut galleries. In addition, 25 locally quarried Egyptian-style anchors studied by Mohamed Mustafa Abdel Maguid and Chiara Zazzaro include all stages of manufacture and use; cordage studies by André Veldmeijer provide information about ship rigging. Fitting the pieces of this archaeological puzzle together lets us explore new questions about ancient seafaring, questions to be examined in detail by the reconstruction Min of the Desert (Fig. 6), a full-scale ship built with ancient methods to sail the route of the pharaohs to the land of Punt in 2008.

Conclusion

The waters that wash the shores of Suez wash the beaches of China. The Red Sea portal to and from the Mediterranean has seen an international complement of ships, sailors and cargoes for thousands of years, but archaeologists have explored only a tiny portion of its history. The maritime artefacts at Mersa/Wadi Gawasis teach us not only about 20 m-long ships and the level of shipbuilding expertise, but also about the vast administrative and bureaucratic nature of ancient Egyptian relations with the world beyond its borders. Studying these forgotten ship planks and equipment – the products of shipyards operating not too far removed from an assembly line – demonstrates that the ancient Egyptians developed a unique technology to achieve their aims as a seafaring people undertaking long-distance voyages thousands of years ago.

The builders of the 50 m-long ship that sank at Sadana Island dealt with the same sailing conditions: hidden reefs and long coral-lined shores with few settlements and a predictable wind and current regime. They sought valuable products from the southern Red Sea, including aromatic incense from the same region the ancients called Punt, but returned with coffee, ceramics, and textiles rather than wild animals and gold.


Excavations along the Red Sea coastline begin to tell the story of the people who supported these elaborate expeditions from 4,500 years ago to the early modern period. With each excavation, archaeologists move across time and space to reveal the relationships between people and places, ships and cargoes, belief and action.

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**Fig. 6:** *Min of the Desert* successfully sailed the Red Sea in December and January 2008/9, demonstrating the seaworthiness and easy handling of this reconstructed ancient Egyptian ship (photo C. Ward).