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The maritime heritage of Yemen: a focus on traditional wooden 'dhows'.

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Abstract

This paper investigates the disappearing heritage of Yemen's large wooden boats ('dhows'), both in its current socio-economic context and in historical perspective. Fieldwork conducted by members of the MARES project in February 2009 along the coast between Aden and al-Salif sought to record remaining evidence of wooden boats and their related industries and practices. Wooden boat use has been in sharp decline in recent decades, as dhow-based commerce has declined, and fishing communities have switched to fibreglass vessels. The fieldwork sought to record remaining dhows through simple survey techniques including photography and illustration, as well as close observation. It also involved ethnographic interviews with people who worked on these vessels, either as builders or mariners. In terms of the vessels themselves, the aim was to produce a typology of Yemeni dhows; to record examples of each; to understand construction sequences; and to inventory the distribution of surviving craft. The findings are compared with previous literature on the subject.

Keywords: Yemen, dhow, construction, typology, ethnography

Introduction

Yemen's geographical position at the junction of the Red Sea and Indian Ocean, and alongside rich fisheries, has ensured it a long history of maritime activity, and a prominent self-identity, at least among coastal Yemenis, as a seafaring people. However, the country's boatbuilding industry based on construction in wood appears to be in a state of terminal decline, much like that of other countries on the Arabian Peninsula. Transformations in the global and regional economy have undermined former economic sectors and trade networks that kept alive the building of 'dhows' – an English-language catch-all term for traditional vessels of the western Indian Ocean. The emergence of the post-independence nation state, the development of modern transport infrastructure, the coming of the oil industry, globalisation, and the introduction of fibreglass boatbuilding techniques have all contributed to the demise of dhow-based industries and commerce throughout the region. Because of Yemen's relative lack of economic development compared to its Peninsula neighbours, the trajectory of decline has been less precipitous than elsewhere. Nevertheless, the past decade has seen wooden boatbuilding dwindle and cease in almost all former centres of activity, and while the relative wealth of Yemen's neighbours means that some governments there have undertaken to support maritime heritage projects, there is little such hope in Yemen. As a result, the material cultural heritage and socially reproduced skills underlying traditional boatbuilding in the country are rapidly disappearing, as old boats disintegrate and former builders and seamen pass away.

A clear understanding of the region's recent boatbuilding heritage, using ethno-archaeological and linguistic approaches, offers a starting point for the investigation of the history and development of wooden boatbuilding in the broader Red Sea region in the more distant past, about which little is currently known.[1] Currently, archaeological evidence for past ship construction is extremely scarce. For the post-Antiquity period, the

[1] Dionisius A. Agius, John P. Cooper, Chiara Zazzaro and Julian Jansen van Rensburg, "The dhow's last redoubt? Vestiges of wooden boatbuilding traditions in Yemen", *Proceedings of the Seminar for Arabian Studies*, 40 (2010): 1-14.

data is limited to some *c.* twelfth century AD ship timbers found on land at Quseir al-Qadim,[2] and the eighteenth century wreck at Sadana Island, both from Egypt.[3] The lack of submerged archaeological data is in part due to environmental conditions, characterised by high sedimentary deposition rates and rapid coral growth, but also to the limited survey work in the region – a situation that is only now beginning to change.

From an iconographic perspective, one of the first depictions of an Indian Ocean 'dhow' comes from a thirteenth century A.D. manuscript of al-Ḥarīrī's *Maqāmāt,* which shows a ship with a raking stern and stem that broadly resemble many modern-era Indian Ocean vessels, including Yemeni ones, as well as stitched planking.[4] But it is not until the eighteenth and nineteenth centuries that clear depictions of Red Sea and Indian Ocean vessels emerge: during the intervening period, many innovations might have taken place, including those under the influence of Portuguese and other European vessels from the end of the fifteenth century.

In more recent times, historical narratives, travellers' accounts and photographic archives provide additional information on changes occurring in vessel size, hull shape, rigging, steering system and building techniques, including those due to the introduction of the engine. The design of some of these has survived, to some extent, until more recent times. However, others observed in the first half of the twentieth century had disappeared completely by the 1970s. For example, the large transom-sterned, curved-prowed *sanbūq* represented in photographs taken during the period of British rule in the south of Yemen is not among the vessels recorded during the MARES survey.[5]

It is differences in the hull shape and size, and sometimes the function of the boat that

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[2] Lucy Blue, "Sewn boat timbers from the medieval Islamic port of Quseir al-Qadim on the Red Sea coast of Egypt", in *Connected by the Sea: Proceedings of the Tenth International Symposium on Boat and Ship Archaeology*, Denmark 2003. 10th International Symposium of Boat and Ship Archaeology ed. Lucy Blue, Fred Hocker, and Anton Englert (Oxford: Oxbow, 2006), pp. 277-283.
[3] Cheryl Ward, "The Sadana Island Shipwreck: An Eighteenth-Century AD Merchantman off the Red Sea Coast of Egypt", *World Archaeology*, 32.3 (2001): 368-382.
[4] George F. Hourani, Arab Seafaring in the Indian Ocean in Ancient and Early Medieval Times (Princeton: Princeton University Press, 1995), p. 99, fig. 7.
[5] David Howarth, Dhows (London: Quartet Books, 1977), p. 36.

people of the region use to identify types of traditional vessel.[6] The situation is complex, however, and does not lend itself to a simple nomenclature. The same name is sometimes given to vessels with different hull-forms even within the same location, let alone from place to place. Equally, the same name can serve a generic purpose for one person, while for another, such as a boat-builder, it might define a particular type of vessel. What is also striking is the persistence of names, as old vessel-types disappear, and new ones emerge. Even modern fibreglass boats are given names that have been in use for centuries and which, until recently, were applied to wooden vessels within the communities concerned.

Fieldwork

It was with a view to assessing and recording some of Yemen's disappearing dhow-building heritage that the authors, member of the University of Exeter's MARES Project carried out a three-week fieldwork survey in the country in February 2009. The survey sought, *inter alia*, to establish a typology of large wooden vessels still to be found in the country, as well as to investigate the processes behind their construction. It soon became apparent that one of the key objectives of this study had to be to document a rapidly disappearing cultural resource – in terms of its material remains, its associated skills based, and its linguistic and oral-cultural legacy. Regarding the dhows themselves, the team recorded the distribution and location of remaining vessels, made detailed notes on construction and type, and took extensive and detailed photographs of the boats and boatyards. Line drawings were made of indicative vessel types, and detailed drawings were made of craft of particular interest. This approach reflected well the MARES team's skill set, which added new methodological avenues to those already taken by Agius in previous ethnographic work in the Arabian-Persian Gulf and Oman.[7] During the Yemen fieldwork, some 25 ethnographic informants were interviewed, their ages varying from their twenties to one man in his nineties. Interviews were conducted by open question, giving

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[6] Clifford W. Hawkins, The Dhow (Lymington: Nautical Publishing Co/London: George G. Harrap, 1977), pp. 81-82.

[7] Dionisius A. Agius, In the Wake of the Dhow: The Arabian Gulf and Oman (Reading, Berkshire: Gartnet Publishing, 2002). Dionisius A. Agius, Seafaring in the Arabian Gulf and Oman: People of the Dhow (London: Kegan Paul, 2005).

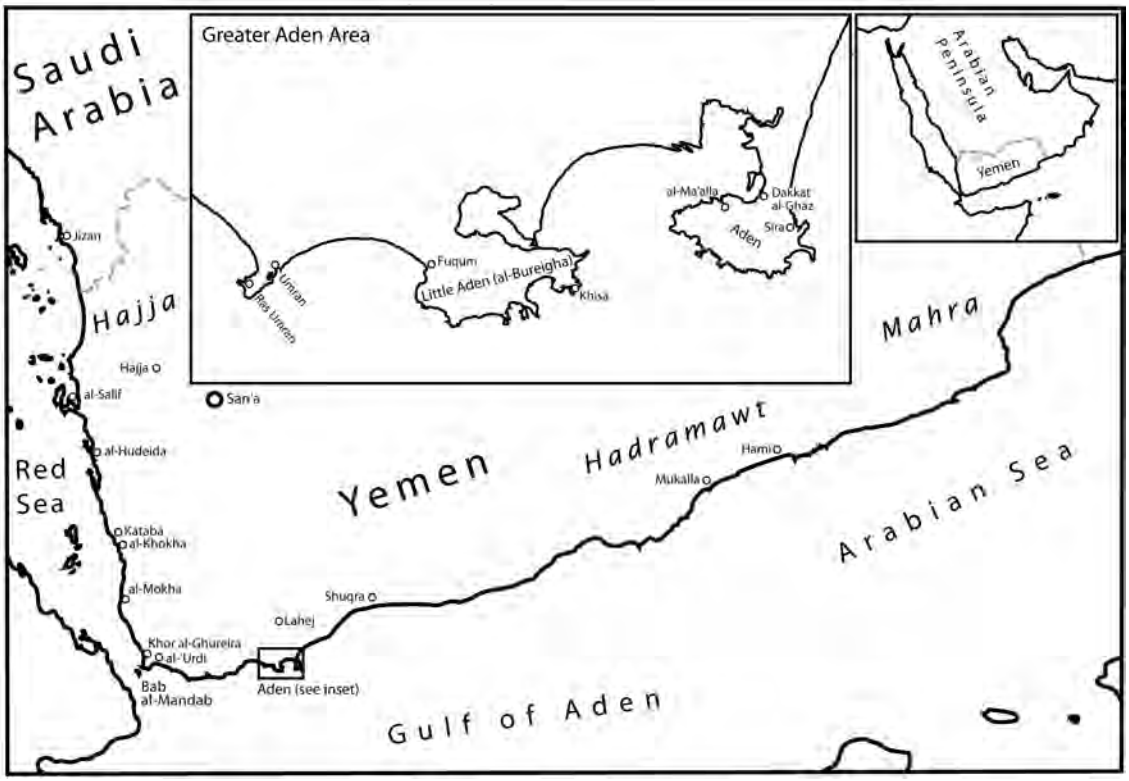

Figure 1. Map of sites visited during the 2009 MARES fieldwork. (J.P. Cooper)

the informant freedom to take the conversation in any direction he[8] wished, rather than restricting them to set or closed questions.

A number of factors, among them limited time and the terms set by the team's insurers, restricted the stretch of Yemen's coast that could be investigated to an itinerary beginning in Aden on the Gulf of Aden, travelling west to the Bab al-Mandab, and then heading north up the Red Sea coast as far as the port of al-Salif (Figure 1). While omitting the potentially interesting coasts of the Hadramawt, Mahra and Hajja governorates, as well as the northernmost coast of the Hudeida governorate, the route nevertheless took in such formerly important dhow-building centres as al-Ghureira, al-Khokha, and al-Hudayda, as well as Aden and al-Salif themselves. Moreover, a visit by Cooper to al-Mukalla in the Hadramawt and to Shuqra in Abyan province in April 2007 had suggested that no dhows or surviving boatyards were to be found there.[9]

[8] All interviewees were male.

[9] The visit was part of the University of Southampton Huri Project, direct by Dr Lucy Blue.

Figure 2. Vessels moored or abandoned in the creek of Khawr al-Ghurayra (C. Zazzaro)

Within the greater Aden area, members of the team visited the Inner Harbour at Maʿalla that was once the centre of the city's dhow-building and trading activity. Other small bays around the Aden peninsula were also visited, but it was only at Maʿalla, specifically Dakkat al-Ghaz, that evidence of dhows was found. On the al-Bureigha (Little Aden) peninsula, the team visited the fishing villages of Khisa and Fuqum, where abandoned dhows were also found.

Along the *ca.* 190 km of often exposed coastline between Aden and the Bab al-Mandab, only two dhows were sighted, one hauled onto the beach at Umran, and one at al-ʿUrdi. Both were instances of a large, plank-hulled vessel with characteristic stern-quarter wings known as the *hūrī* (Arabic pl. *hawārī*) – a term also given to types of much smaller fishing 'canoes' not covered by this survey of larger boats. Having turned the corner into the Red Sea, instances of wooden dhows became more frequent. The creek of Khor al-Ghureira, *ca.* 5 km north of the Bab al-Mandab, contained several working and abandoned dhows of various types (Figure 2). The adjacent village of al-Ghureira had a boatyard, but no work was ongoing at the time of the visit. Further north, the former coffee port of al-Mokha, today a minor commercial port and fishing town, was dominated by fibreglass fishing vessels, but three abandoned *hūrī*s, plus a transom-sterned vessel with an inboard motor (in contrast to the outboard-engined *hūrī*s), were found hauled onto its southern beach.

The next site on the itinerary was al-Khokha, a fishing and market town that was formerly a major centre for the building of fishing and small cargo dhows. Small family owned

boatyards, all idle, were found clustered around the fish market in the south of the town, and in the quarter known as al-Qaysha, 1.2 km to the north. Almost all of these yards contained unfinished but abandoned vessels. The 2 km-long lagoon at al-Khokha was also fringed with more than 100 vessels, all *hūrī*s, the vast majority of which had been abandoned.

The modern port of al-Hudeida is Yemen's largest on the Red Sea. Remaining dhow activity is in the form of fishing, and is concentrated around the modern fish market in the centre of the city. The great majority of working vessels observed were fibreglass, and fewer than ten wooden vessels were in the water. A small boatyard within the market continued to repair existing boats. Almost 100 wooden vessels were abandoned within the market's perimeter wall.

The final site visited was al-Salīf, an oil-exporting, salt-mining, and fishing town some 60 km north of al-Hudeida. The town had an abandoned boatyard, again containing unfinished vessels. Several wooden fishing vessels were observed to be still in use, with a number anchored in the bay facing and to the south of the town.

Socio-economic context

Yemen is possibly the poorest Arab state, with over 45% of its 23 million population living under the poverty line, and unemployment running at 35%.[10] In comparison to much of the rest of the Arabian Peninsula, its oil reserves are paltry and dwindling rapidly. The country's rich maritime resources are regarded as a key target area for economic growth, and are the recourse of tens of thousands of coastal dwellers seeking subsistence from fishing.[11]

The decline of wooden boatbuilding in the country is in part connected to the spread of fibreglass boats through the country as an economic method of gaining access to those

[10] United States Central Intelligence Agency, The World Factbook: Yemen, https://www.cia.gov/library/publications/the-world-factbook/geos/ym.html, last accessed 4 August 2010.

[11] Food and Agriculture Organization of the United Nations, Fishery Country Profile: The Republic of Yemen, 1 (Rome, Food and Agriculture Organization of the United Nations, 2002): 4-5; World Bank & International Bank for Reconstruction & Development, Economic Growth in the Republic of Yemen: Sources, Constraints & Potentials (Washington, D.C.: World Bank, 2002): 19.

reserves. This process appears to have begun in the former People's Democratic Republic of Yemen (PDRY), the quasi-Marxist entity that took shape following Britain's withdrawal from the former Aden Protectorates in 1967. Small-scale manufacture of fibreglass boats was already underway there in the 1980s, but several interviewees said that it was following the repatriation of almost a million Yemenis in 1990 following the Iraqi invasion of Kuwait – the year also of the unification of the PDRY with the northern Yemen Arab Republic (YAR) – that fibreglass boat manufacture took off. Yemenis, particularly Hadramis, returned home with capital amassed in the Gulf states. Some invested in new fibreglass ventures, and boatyards were established in a number of Hadramis port towns, including al-Mukalla and al-Shihr. The relatively developed system of fishing co-operatives in the former PDRY meant that artisanal fisherman, who constitute the major part of Yemen's fishing industry, were able to access credit, allowing them to buy fibreglass boats powered by outboard motors.[12] The process has been slower in the former YAR, where institutional support for small scale fishermen has typically been weaker. Nevertheless, the use of open fibreglass boats up to *c.* 11 m in length has become the norm for these fishermen throughout the country. The use of small wooden fishing craft is now extremely rare throughout Yemen, particularly in the former PDRY. However, the functional flexibility of the fibreglass vessels that replaced them has meant that these same fibreglass craft have, in many locations, supplanted the function of larger wooden fishing vessels such as the *ʿobrī* and the large 'winged' *hūrī*s discussed below. Moreover, in some locations, such as al-Salif, fibreglass facsimiles of ʿ*obrī*s and *hūrī*s are being manufactured.

The shift to fibreglass appears to have instigated a spiral of decline for wooden

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[12] Angelo Bonfiglioli and Khaled Ibrahim Hariri, Small-scale Fisheries in Yemen: Social Assessments and Development Prospects (Rome: Food and Agriculture Organisation of the United Nations/Washington D.C.: The World Bank, 2004), pp. 53-58. S. Shetty, "Credit for Fishermen: the Experience in Yemen Arab Republic", in Fisheries Credit Programmes and Revolving Loan Funds: Case Studies, eds. U. Tietze and P. Merrikin (Rome: Food and Agriculture Organisation of the United Nations, 1989): www.fao.org/docrep/003/T0274E/ T0274E15.htmḍch1. Last accessed 15 August 2010. Ali Mohammed Suliman, "People's Democratic Republic of Yemen Case Study of Fisheries Credit", in Fisheries Credit Programmes and Revolving Loan Funds: Case Studies, eds. U. Tietze and P. Merrikin (Rome: Food and Agriculture Organisation of the United Nations, 1989): www.fao.org/docrep/003/T0274E/ T0274E15.htmḍch1. Last accessed 15 August 2010. Arnout Wagenaar, Marijke D'Haese, "Development of small-scale fisheries in Yemen: An exploration", Marine Policy, 31.3 (2007): 266-275.

boatbuilding. The authors saw only one ‘wooden’ boatyard in action during their survey, at al-Hudeida. But activity was limited to the repair and maintenance of existing vessels, and the master builder there said that he no longer built dhows from scratch. In many of the idle boatyards visited, such as at al-Khokha and al-Salif, the owners said that they had not built a new dhow for five to eight years.[13] Only in the al-Ghureira yard did the builder say he had built a new wooden dhow, a *zārūq*[14] (see below), in the previous two years.

The economic history of the decline of Yemeni cargo dhows remains under-studied. By the time of this survey, the largest cargo s*anbūq*s – ocean-going vessels of around 250 t with decorated transom sterns and curving prows – had long since been defunct, and no examples were observed in any state of repair. It is unlikely that use of these vessels continued long into the post-colonial era. The smaller version of this craft, the *sāʿiya*, was likewise absent from the survey, although Prados observed one preserved as a roadside monument in Hami in during fieldwork in 1993-94.[15] Only one abandoned example of the double-ended *zaʿīma* was observed. A few *zārūq*s continue to transport goods between Yemen and Djibouti, and the occasional large *hūrī* and *ʿobrī* is used to transport livestock and people to Yemen from the Horn of Africa. Not all of this traffic is legal. However, the number of vessels involved in these activities appears to be extremely limited.

Literature review

Written and visual accounts of Yemeni vessels start to appear from the nineteenth century, mostly in the publications of European travellers, and often within the wider context of Indian Ocean dhows.

The first detailed treatment of Yemeni craft was by the French Admiral Pâris in the nineteenth century, whose monumental work on Indian Ocean vessels includes detailed scale-drawings of Red Sea vessels, such as *sanbūqs* and *zārūqs*, also observed by later

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[13] Interview with Mr Muḥammad ʿAlī, boat-builder, al-Salīf, 21 February 2009; interview with Mr ʿUmar Saʿīd Bāhaydar, boat-builder, al-Khawkha, 15 February 2009.

[14] In coastal Yemeni dialects, the uvular stop /q/ of classical Arabic is usually rendered a voiceless (or sometimes voiced) velar stop. While toponyms in this paper are given in Classical Arabic form, boat terminology is given in dialect form.

[15] Edward Prados, “Indian Ocean littoral maritime evolution: The case of the Yemeni Huri and Sanbuq”, The Mariner’s Mirror, 83.2 (1997), p. 194.

authors.[16] He was followed in the 1920s by Alan Moore, whose "Last Days of Mast and Sail" includes brief descriptions and illustrations of craft in Aden.[17] He also published articles on Red Sea dhows in 1920 and 1940. In addition to his own observations, he presented data from other Europeans travellers.[18] According to Moore, large cargo-carrying *sanbūq*s and *sāʿiya*s were the most common dhow type at that time.[19] Hornell, in the 1940s, included detailed descriptions of the Yemeni *zaʿīma* and *zārūq* in his "Tentative Classification of Arab Craft", also providing illustrations. Both Moore and Hornell developed a typology distinguishing two major groups of vessels, based on whether they had a transom stern or were double-ended.[20] Soon after Hornell, Le Baron Bowen wrote an article on the smaller watercraft of the Arabian Peninsula, including Yemen, as well as another on dhows in eastern Arabia.[21]

In the 1970s, Howarth and Hawkins produced lavishly illustrated accounts of the dhow which included, for the first time, coloured photographs of Yemeni dhows, mostly in Aden, as well as a broad typology. Hawkins observed dhows in Aden during visits he made in 1939 and 1959. In the first, he observed 50 large sailing dhows in Maʿalla: twenty years later the shipyard had moved to a new location, which was occupied instead by ocean-going *sanbūq*s, *zārūq*s of the type observed by the present authors, and *būm*s, all powered by engines.[22] Howarth carried out his work in the 1970s: it focuses on the Arabian-Persian Gulf and Oman, and makes no observations of vessels specific to Yemen. However, he does briefly describe the transom-sterned *sanbūq* of the Red Sea that disappeared from Yemen in the years after his book was published.

Meanwhile, studies by Pujo and Perrier provide information on traditional wooden boats in

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[16] François Edmond Pâris, Souvenirs de la Marine (Paris: Musée de la Marine, 1882).
[17] Alan Moore, Last Days of Mast and Sail (Oxford: Clarendon Press, 1925).
[18] Alan Moore, "Craft of the Red Sea and Gulf of Aden", The Mariner's Mirror, 6.1 (1920): 73-76, 98-105, 136-142. Alan Moore, "Notes on 'Dhows'", The Mariner's Mirror, 26.2 (1940): 205-213.
[19] Moore, "Craft of the Red Sea", 98.
[20] Moore, "Notes on "Dhows", 207. James Hornell, "A tentative classification of Arab sea-craft", The Mariner's Mirror, 28.1 (1942): 11-40, p. 15.
[21] Richard LeBaron Bowen Jr., "Arab dhows of eastern Arabia", The American Neptune, 9 (1949): 87-132. Richard LeBaron Bowen Jr., "Primitive Watercraft of Arabia", The American Neptune, 12 (1952): 186-221.
[22] Hawkins, 58.

Figure 3. A large "winged" hūrī in the sea at al-Khawkha. (J. P. Cooper)

Djibouti, but built by Yemeni boatbuilders resident there or in Yemen.[23] However it was not until Edward Prados's fieldwork that close interest was taken in construction methods.

Vessel typology

One of the objectives of the fieldwork was to establish a typology of contemporary Yemeni dhows. By far the most common on the Red Sea coast was the large 'winged' *hūrī* already mentioned (Figure 3). The greatest concentration of this type was in the Red Sea, particularly at al-Khokha – where they comprised, with few exceptions, almost the entirety of the fleet hauled up on the beach – and at the al-Hudeida fish market. However, they were also seen at Aden, Khisa, Fuqum, ʿUmran, Khor al-Ghureira, al-Mokha and al-Salif. Unfinished *hūrī*s were also seen in boatyards at al-Khokha and al-Salif.

This type of *hūrī* appears to be a relatively new addition to the Yemeni dhow inventory. While the name has a much older provenance,[24] the craft itself appears to be an innovation of recent decades aimed at accommodating the outboard engine. The first scholar to observe this vessel in detail appears to have been Prados, during his fieldwork

[23] Jean Marie Pujo, "Les boutres à Djibouti: une survivance de l'age de la voile", Pount, 2 (1967) 9-15. Henri Perrier, Les Boutres de Djibouti. Dessins, notes et croquis (Imprimerie Nationale: Djibouti, 1994).

[24] Agius, "In the Wake of the Dhow", 121.

of the early 1990s.[25] The craft tend to be around 12-19m in length, and are relatively sleek in hull form. The bow shape is very similar to that of the *ʿobrī* (discussed below) in that it is dead straight, and raking at an angle of around 147° to the keel. While the construction sequence (again, discussed below) is quite different, the final appearance of the hull, apart from the stern, is very like that of other Yemeni dhows: the framing elements typically alternate between a pair of futtocks that almost meet end to end just above the keel, and a tripartite arrangement of a floor with two extending futtocks. The paired futtocks are often extended upward by upper futtocks which secure the higher planking. Like all other Yemeni dhows, the planking is carvel, and attached to the framing elements with cleated nails.

It is at the stern that the *hūrī* is distinctive. Here there is a very small, and extremely low, transom element onto which one or two outboard motors are mounted. An upward-sloping bulkhead set forward of this transom prevents the backwash of water into the hull. Since this small transom is set very low, the higher strakes of the hull have nothing on which to attach: instead they form two pointed stern-quarter 'wings' that are, from a distance, the *hūrī*'s visual signature. These wings are often decorated with abstract and colourful designs.

Between the fore and aft decks, the hull of the *hūrī* is open to the bilges. Often this space is filled with a large fibreglass tank for holding a fishing catch, or used to carry livestock. The *hūrī* is used in a variety of fishing, including sein netting, shrimping and collecting sea cucumbers. It is likewise used to transport livestock, mainly sheep, from the African coast. It is also used to carry people, particularly refugees seeking to cross from Djibouti and Somalia.

The transposition of the word *hūrī* from its origins in a dugout canoe to these large winged dhows is an interesting one, and seems to be related to the vessel's most common

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[25] Edward Prados, "Huris, Sanbuqs and the boat builders of the Yemen", Woodenboat, 131 (1996); 50-56. Edward Prados, "Indian Ocean littoral maritime evolution". Edward Prados, "Traditional Fishing Craft of the Tihamah and Southwestern Arabian Coast", The American Neptune, 56 (1996): 89-115. Edward Prados, "Wooden Boats of the Yemeni Tihamah", Nautical Research Journal, 43.4 (1998): 195-209. Edward Prados, "Contemporary Wooden Fishing Craft of Yemen", Yemen Update 40.5 (1998) http://www.aiys.org/webdate/prados.html, Last accessed 4 August 2010.

Figure 4. An ʿobrī propped at Dakkat al-Ghāz, Maʿallā, ʿAdan. (J. P. Cooper)

function, fishing. Already in the 1970s, Hawkins observed that Yemenis were applying the name to new, motorised fishing boats as the fishing industry expanded – though he does not describe these craft.[26] The name is widely applied today to small fibreglass fishing craft.

Three types of double-ended vessel found in Yemen today are often referred by the term *sanbūq*, although all have more specific names that are used by more knowledgeable members of the community, such as boat builders and seafarers. The first of these, the *ʿobrī*, was the most frequently observed of the three during our fieldwork, but it was by no means common. An *ʿobrī* was seen on props at Dakkat al-Ghaz in Aden (Figure 4); another, working, was observed in the water in the harbour itself; and one more was seen at Fuqum. All other examples were recorded in the Red Sea. One working craft was recorded at Khor al-Ghureira, while others were seen, incomplete and abandoned, at boatyards in al-Khokha. A small number of working *ʿobrīs* were also seen in al-Hudeida and al-Salīf, where they were used for fishing, including shrimping.

The *ʿobrī* is a broad-beamed, double-ended craft, typically up to 22m in length and 6m in width. It has a straight, raking external stem-post that runs to the full height of the bow, and at an angle, like the large *hūrī* already described, of around 147° to the keel. The straight stern post is usually at a steeper angle of around 124° to the keel, and also runs to the full height of the stern. The vessel has an inboard motor, and its hull is adapted at the stern to

[26] Hawkins, 82.

Figure 5. An abandoned zarūq at Khawr al-Ghurayra. (C. Zazzaro)

allow a prop-shaft to emerge into a space, forward of the stem-post, created for the propeller. The wash of the propeller passes over the stem-post and the rudder blade attached to it. The midships area is open to the hold, with decks fore and aft. The term *ʿobrī* is not mentioned in previous literature on Yemeni craft, but craft is clearly the "*ibʿri* (*sic.*)" whose construction Perrier describes,[27] and the vessel type is clearly the "*sanbuq*" encountered by Prados in the early 1990s[28].

The second vessel, sometimes referred to as a *sanbūq*, is the *zārūq* (Arabic pl. *zawārīq*) (Figure 5), formerly a common cargo vessel. Most of *zārūq*s observed in the MARES survey were at Khor al-Ghureira, where five abandoned and one working craft were recorded. Another was observed unfinished and abandoned at a boatyard in al-Salīf. The overall hull form and construction of this craft is very similar to the *ʿobrī*, although it is generally larger – typically 17-24m in length and 4.5-6.2m across the beam. It is typically less streamlined in shape, with a pronounced chine. However, what distinguishes the *zārūq* most immediately are its bow and stern profiles. While the *ʿobrī*s external stem- and stern-posts run to the full height of the bow and stern respectively, those of the *zārūq*, though straight like the *ʿobrī*s, are foreshortened, ascending no further than approximately deck level. [29] Above that point, the port and starboard hull planking comes together and

[27] Perrier, 54 ff.
[28] Prados, "Huris, Sanbuqs", "Indian Ocean Littoral".
[29] See also Hawkins, 61.

meets, held in place by the inner stempost. The resulting 'jagged' profile is unique among Yemeni dhows.

The division of hull space is typical of other s*anbūq*s. There is normally a single deck fore and aft of the midships area, which is an open hold. The craft is today propelled by an inboard motor that is configured in the same way as that of the *ʿobrī.* The rudder is controlled by a tiller. The few remaining working *zārūq*s in the southern Red Sea are used to carry cargo, particularly foodstuffs and livestock, between Yemen and the African coast.

This *zārūq* type can tentatively be traced back to the early 20th century. Prados saw examples up to 26m long under construction in the 1990s, while Hawkins observed them in Aden in the 1970s, and says they were powered by one or two sails, and later by an inboard engine.[30] Hornell appears to have recorded the same vessel in Djibouti in the 1920s, and illustrates it in the water with its distinctive foreshortened stempost. But he claims that the stem and stern on the vessels he observed "rake in a graceful curve from the keel upward" – unlike the straight profiles of the modern *zārūq*. It was steered, he said, using a system of lines and tackle, rather than with the modern tiller.[31]

It is interesting that the Australian traveller Alan Villiers sailed in the 1930s from Aden to Jizan on a two-masted Yemeni vessel also called a *zārūq* – but his photograph of it shows that this was a very different vessel-type from that observed by the MARES team and Hawkins. It had a curving stempost and stem-head resembling that of the old ocean-going *sanbūq*s.[32]

The third vessel sometimes referred to as a *sanbūq* is the *zaʿīma.* Although this name was familiar to many informants interviewed during the survey, only one example of this large double-ended cargo dhow was actually seen, at Khor al-Ghureira – a 22.4 m-long vessel, formerly with an inboard motor, in a state of advanced decay (Figure 6). The *zaʿīma is* distinguished by the shape of its bow profile: the stem-post begins its raking ascent from the keel in a straight line, much like the *ʿobrī.* However, in its upper reaches, it curves upwards, producing a bow shape that distinguishes it from both the *ʿobrī* and the *zārūq*.

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[30] Prados, "Wooden Boats", "Contemporary Wooden Fishing Craft", "Traditional Fishing Craft". Hawkins, 10, 13, 60-61, 67, 141.

[31] Hornell, 27.

[32] Alan Villiers, Son of Sinbad (London: Arabian Publishing 2006), pp. 12-17.

Figure 6. A zaʿīma at Khawr al-Ghurayra. (J. P. Cooper)

In the early twentieth century, both Moore[33] and Hornell[34] reported *zaʿīma*s observed at al-Hudeida and at Jedda, but their descriptions are vague and they provide no illustrations. In the 1960s, Pujo observed and photographed *zaʿīma*s in Djibouti. These were vessels up to 20m long with a capacity of 30 t and with the characteristic curved stem of the double-ended *zaʿīma* observed in Yemen by the present authors, but they had a transom stern.[35]

Like many Arabic words applied to boat types, *sanbūq* has been applied to a wide variety of vessels. Hawkins observed during his visits to Aden that it was applied to almost any fishing boat,[36] while Prados noted that it was given to a type of small double-ended sewn fishing craft. [37] In terms of larger vessels, it was applied to those ocean-going cargo dhows that disappeared in the 1970s or 1980s. These had escutcheon-shaped transom sterns and upward-curving stemposts.[38] Originally having one or two masts, they later were converted to take an inboard engine. They were often highly decorated at the stern.[39] Similar to this type of *sanbūq* was the *sāʿiya,* described in the last century by Moore,

[33] Moore, “Craft of the Red Sea”, 99.
[34] Hornell, 34.
[35] Pujo, 9-10.
[36] Hawkins, 15, 81.
[37] Prados, “Contemporary Wooden Fishing Craft”.
[38] Hawkins, 60.
[39] Moore, “Craft of the Red Sea”, 73-76. Hornell, 17-20.

Figure 7. A bōt at al-Ḥudayda. (J. P. Cooper)

Hornell, Villiers and Prados.[40] No surviving material evidence of these *sāʿiya*s was found during the survey.

The final vessel type recorded on the survey was the *bōt*, single examples of which where observed in Dakkat al-Ghaz and al-Hudeida (Figure 7). Informants regarded these craft as "not Yemeni", and variously identified their origin as Oman or India. The word itself appears to derive from the French *boutre* – equivalent to the English word 'dhow' – a term used in Djibouti for similar boats subsequently observed by the MARES team in Djibouti in October 2009. The *bōt* is a squat, transom-sterned vessel with an inboard engine and straight stempost that is more upright than other Yemeni craft. Its hull has a very square cross-section.

Not all vessels observed during the survey could be easily classified or named. A large dhow measuring 23.5m in length, was observed at Khor al-Ghureira with a straight, raking bow profile like a very large *ʿobrī*, particularly in its bow profile, but with large, flat transom

[40] Moore, Last Days of Mast and Sail, 123. Hornell, 20. Villiers, 365. Prados, "Contemporary Wooden Fishing Craft".

stern that made it unlike any other craft seen on the survey. At the same time this vessel was quite distinct from the decorated transom-sterned *sāʿiya*s and *sanbūq*s found in Yemen before the 1970s.[41]

Yemeni dhows are today all powered by engines – outboard in the case of the large 'winged' *hūrī*s, and inboard in all other cases. The only sails observed in use were lateen-type (Arabic: *shirāʿ muthallath*) made of blue nylon tarpaulin, used to propel a handful of small double-ended fibreglass *hūrī* 'canoes' in al-Khokha. Rudimentary and lightweight lateen rigs were also occasionally seen furled on large *hūrī*s and *ʿobrī*s, but these were held in reserve, and used only in case of engine failure. In the past, larger *zaʿīma*s and *sanbūq*s had two masts, though smaller craft had only one. The universal rig of the larger craft, at least in the twentieth century, was the settee or lateen sail, set on a forward-leaning mast (Arabic: *daqal qāyim*).[42] When sails were still in common use, they were often made of a fabric called *mirākān*, also used for funerary shrouds. Also used was a fabric called *marbūʿ* from Lahej or Aden.[43]

Boat Construction

In the nineteenth century, Yemeni boat builders were renowned throughout the southern Red Sea for their skill, so much so that several moved to Djibouti to make up for a lack of skilled carpenters there.[44] However, by the 1990s, the only active boatyards were on Yemen's Red Sea coast, with the main centres at al-Luhayya, al-Khokha, al-Hudeida, and Kataba.[45] The MARES team visited boatyards at Aden, Fuqum, Khor al-Ghureira, Khokha, al-Hudeida and al-Salif. The yard at al-Hudeida – the only one that was active during the survey – utilised modern metal buildings within the city's fishing harbour and market. The others were very simple open-air spaces, with a small hut associated with the working area in most cases (Figure 8). From-scratch construction was not under way in any of the

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[41] Howarth, 57-60, 64. Prados, "Indian Ocean littoral maritime evolution", 194.
[42] Interview with Ibrāhīm Muḥammad ʿAbduh al-Anbārī, originally from al-Khawkha, in ʿAdan, 10 February 2009.
[43] ʿAli Ibn ʿAlī Sālim, boat builder, Khīsa (interviewed 10 February 2009) and Muḥammad Aḥmed Zaid al-Anbārī, Khawr al-Ghurayra (interviewed 12 February 2009).
[44] Perrier, 24-25.
[45] Prados, "Contemporary Wooden Fishing Craft".

Figure 8. An artisanal boatyard at al-Khawkha, comprising a small carpenter's hut and open shelter, alongside an open-air boatbuilding area with an almost-complete, but abandoned, ʿobrī. (J. P. Cooper)

locations visited. Many builders said that it had been several years since they had built an entire vessel. The only activity observed during the MARES fieldwork was in al-Hudeida, and involved the repair and replacement of the lower planking of a traditional wooden vessel, caulking the hull, and the application of wood preservation coatings to the outer hull.

In the yards at al-Khokha, MARES researchers found examples of unfinished *ʿobri*s and large *hūrī*s abandoned at various stages of completion, allowing a relatively close inspection of the construction sequence. Retired boat-builders were also interviewed in order to better understand the construction processes.

Construction of the *ʿobrī* followed a sequence of so-called 'mixed' construction – where framing and planking timbers are built up together – which is typical of boatbuilding on the Arabian Peninsula. First, the keel is laid and rabbetted. The stem-post, stern-post and *samaka* – the L-shaped timber through which acts as a bearing for the propeller shaft – are fixed in place, and also rabetted (Figure 9). The garboard strakes are then heat-shaped and attached to the keel, with their positions maintained by temporary chocks attached to the keel. Then a variable number (typically four or five) of pairs of guide futtocks (Arabic

Figure 9. An ʿobrī in its early stages of construction. The keel has been laid and rabbeted. The stem-post, stern-post and the L-shaped timber through which the propeller shaft will ultimately pass, also rabbeted, have been fixed in place. The four pairs of guide futtocks are visible, held in place by cross-spawls. (J. P. Cooper)

Figure 10. ʿObrī construction: adjacent strakes are held flush together using temporary battens and chocks. (J. P. Cooper)

Figure 11. ʿObrī construction: as the hull strakes are built up and the hull shape established, additional framing timbers are installed, here starting from the bow (right in picture). Upper futtocks may be added to secure the highest strakes. (J. P. Cooper)

a*khmās,* sing. *khums*) are affixed at intervals along the keel. The shape of each futtocks is established using a bent wire in the desired curvature of the final futtock, which is laid on a naturally crooked timber, and the shape traced on. Thereafter the timber is trimmed to shape using an adze or electric saw. The *akhmās* pairs are then nailed to the garboard strakes: the spread of each pair is decided by eye, and symmetry maintained using string and plumb-bobs. Each pair is then held in place using cross-spawls and sometimes external props. At this point the builder starts to build up the hull planking, with adjacent planks held together using temporary battens and chocks (Figure 10). When the lower hull planks are in place, additional futtock pairs are installed, with floor timbers are alternating between these pairs and bolted to the keel. Upper futtocks are allocated to these as the hull planking ascends (Figure 11). Once the hull shape is thus established, internal stringers are attached, the inboard engine mounted, and the crossbeams, decking, and superstructure are added.

Meanwhile, the (large) *hūrī* is built using a starkly different construction method, in that the keel and stem- and stern-posts are added at the very end of the hull construction process. In this case, the garboard strakes are heat-shaped and nailed at their ends to themselves

and to internal stern and stem knees (Figure 12). A gap is left between the garboard strakes that will eventually accommodate the keel (Figure 13). This gap is kept uniform using one of two methods – either looped strings are used to prevent the garboard strakes from splaying apart, or wooden spacers are nailed across the gap (Figure 14, left). Similar spacers are also used to maintain the position of the lower ends of the *khums* pairs (Figure 14, right), which are added next, while the overall symmetry of these pairs is, as in the *ʿobrī*, maintained using temporary cross-spawls and outer props. In the cases examined, three of four *khums* pairs were used, with additional futtocks added as the hull planking ascended. At the bow – and for the lowest of the strakes at the stern, i.e. those below the beginning of the transom stern – the hull planking is nailed together at its ends, and to the same inner knees to which the garboard strakes were attached. At the bow, higher strakes are affixed to an inner stempost that continues in a straight line the rake of the knee. At the stern, those strakes that run higher than the point where the stern knee meets the bottom of the transom are instead attached to the stern-most futtock pair of the vessel, beyond which they start to project to form the *hūrī*s 'wings'. No outer stem- or (lower) stern-post timbers exist at this stage. With these and the keel still absent, the hull continues to be built up much as in the case of the *ʿobrī*: as the planking ascends the hull, additional futtock pairs are added, and floor timbers are interspersed between them. The floor timbers, having yet no keel to which they can be fixed to, are nailed to the planking – the cleated nails entering from outside the hull. It is only when the process of building up the hull is thus complete that the keel and outer posts are added. According to informants, in order to achieve this, the builders roll the hull to one side, and attach the prepared keel by bolting it up to the floor timbers. The outer posts are then added, followed by other internal elements and superstructure. Informants explain that this particular keel-last process is only possible because the *hūrī* uses outboard motors, which make the hull light enough to roll over for the fitting of the keel. In contrast, they say that it is the inboard motor that requires the *sanbūq* to be built keel-first.

Despite these starkly different sequences, the completed *hūrī* and *ʿobrī* are in the end structurally very similar – the boat-builder establishes the form of the hull using first the guide futtocks (*akhmās*), and then by the subsequent build-up of the planking and

Figure 12. The first stage of construction of the hūrī: the garboard strakes have been heat-shaped, and are fastened at their ends to internal stern and stem knees. (J. P. Cooper)

Figure 13. The hull of a hūrī in its early stages of construction: the planks have been heat-shaped and built up from the garboard strakes around five guide-futtock pairs. Note the absent keel. (J. P. Cooper)

Figure 14. The space between the garboard strakes of the hūrī into which the keel will ultimately fit is kept uniform using string to prevent the strakes from parting (above), or chocks, which lock them in place (below). (J. P. Cooper)

additional futtocks. The process is neither entirely frame-first nor plank-first, but a mixture of the two, with the overall shape determined by eye, and realised through the build-up of futtocks and planking.[46] In both cases, the keel and floors are largely incidental to the

[46] Lucien Bash, "Ancient wrecks and the archaeology of ships", International Journal of Nautical Archaeology and Underwater Exploration, 1 (1972), pp. 1-58. Patrice Pomey and Eric Rieth, L'archéologie navale (Editions Errance: Paris 2005), pp. 33-35. A similar process was noted in the

establishment of the hull shape, but rather provide essential structural strength to the final vessel.

The traditional coating for the outer timbers of a vessel is *shaḥam*, a mixture of animal lard and gypsum (*nūra*) (Figure 15, left). More recently, petrochemical oil-based paint (*rang*) has been used instead, although the transition has not necessarily been in one direction. Hulls with *shaḥam* applied over modern paint were also recorded. In al-Hudeida, a man involved in the maintenance of a traditional wooden vessel was mixing petrochemical paints with the traditional *shaḥam* to produce a hybrid coating. Meanwhile, on the inside of the vessels, the traditional coating was *sīfa*, a mix of shark oil, charcoal, and incense that protected the timbers from the sun (Figure 15, right). Yemen dhows are often painted with bright colours, and sometimes highly decorated with carving or painted designs – often especially along the stern quarters.

Wood used in boat building

The rising cost of timber – and of the skills required to work it – has been one of the many factors propelling Yemenis towards fibreglass boat construction. Historically, Yemen boat-builders had, like the rest of Arabia, depended heavily on India for exports of wood, particularly Malabar teak (*Tectona grandis* sp., Arabic *sāj*/*sāg*), and boat owners and builders pointed out surviving examples of vessels made entirely of that wood.[47] Muḥammed al-Najjār, a retired boat-builder in his 90s living in Fuqum, said the teak he had imported when he was a dhow builder some 20 years earlier had been 3-4 inches (7.62-10.16 cm) thick.[48]

However, in Yemen's case, a number of locally or regionally grown trees could also be drawn upon. The dense wood and natural crooks of *arj* or *ʿilb (Ziziphus spina christi)*,

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building of the racing *hūrī* in Abu Dhabi. See Agius, In the Wake of the Dhow: The Arabian Gulf and Oman, p. 135.

[47] Sālim Hādī Shangī, interviewed Fuqum, 10 February 2009, and Umar Said Bāhaydar, interviewed al-Khawkha, 16 February 2009.

[48] Interviewed 10 February 2009.

Figure 15. A *zaʿīma* hull covered with white *shaḥam*, a mixture of animal lard and gypsum (*nūra*) (left). The traditional coating for inside the vessel is called *sīfa*, a mix of shark oil, charcoal, and incense (right). (J. P. Cooper and C. Zazzaro)

muraymara (*Melia azaderach L.*)[49] and *damas* (*Conocarpus lancifolius Engl*)[50] were used extensively as hull framing timbers, for the timbers of the stem and sternposts, and for the curved *samaka* (or *kirda*) timber that acted as the propshaft bearing in vessels with an inboard motor. Imported wood that fulfilled these functions included *mītī*, apparently from Somalia, and *zur* (or *zann*) from Asia. Another wood sometimes used for framing timbers was called locally *dayman*, but no more information could be gathered about it.

The keel might be made of imported woods such as teak, or from imported woods that informants named as *zengilī ʿayn*, *zengilī ḥadīdī*, *zengilī aḥmar*, *zengilī būna*, *zengilī gāwa* and *sunt abyaḍ*.[51] Further work is required to relate these local names to tree species. In the absence of imported timber, the keel might be made from local woods such as *damas*.

Planking was always imported. In recent years, teak had given way to other timbers. Wood referred to locally as *zengilī* or *zengilī aḥmar* was used for planking at or below the water line. Informants believed this wood came from Asia, citing Singapore, Indonesia, Malaysia and China as sources, while softwoods (*khashab abyaḍ* or *ṣanawbar* (pine)) from

[49] N. A. Awadh Ali, W.-D. Jülich, C. Kusnick, and U. Lindequist, "Screening of Yemeni medicinal plants for antibacterial and cytotoxic activities", Journal of Ethnopharmacoloy, 74.2 (2001): 173-179. p. 175.

[50] A. Bilaidi, "Silviculture in the People's Democratic Republic of Yemen", Unasylva, 30.121 (1978), 3.

[51] ʿUmar Saʿīd Bāhaydar, Interviewed 15 February 2009.

temperate countries such as Russia and Sweden were sometimes used for upper planking and decking.

At Dakkat al-Ghaz, the rump of dhow activity in Aden, about 20 tall masts were observed lying near an *ʿobrī*; Mohammed al-Ghaili[52] believed these had belonged to *zaʿīma*s that had been hauled up in the area in the past. He said the timber of these masts was either *fann* (punnai or poon timber) from Malabar, or *~anawbar* (pine); timbers forming the head of the masts were of teak.

Conclusion

The MARES fieldwork found Yemen's wooden boatbuilding industry apparently in the final stages of its decline, with few wooden boats still in use, and no boatyards still active in wooden boat construction. Just as many wooden vessels lie idle and decaying around Yemen's coast, so too most of the men who built them find themselves without employment, or retired having no business to pass on to their sons. As younger men shift to fibreglass boat construction, the skills surrounding wooden boat-building are being lost.

Yemeni fishermen have taken up fibreglass boats with enthusiasm, though some older men doubt the merits of the new material. The 60-year old Ahmad Qahtan from Sira, Aden, said: "I have no choice but to use a fibreglass (*blastīk*) boat. Wooden boats are far better. They are easy to repair. As for the fibreglass, admittedly, they are easy to build, cheaper and faster to manoeuvre. But they aren't seaworthy: they can overturn easily".[53] However, such opinions count for little in the rush towards "modernisation".

The rapid abandonment of wooden boatbuilding left the MARES group with little opportunity to observe boatbuilding activities. However the sudden abandonment of wooden boatbuilding meant that many craft, particularly on the Red Sea, were left unfinished in boatyards, and available for inspection – while their unemployed builders were kindly willing to explain construction methods. The authors were able to record in some detail construction techniques for the remaining vessels – documenting the keel-first construction of the *ʿobrī* and the keel-last approach of the *hūrī* taking place within the same

[52] Interviewed 7 February 2009.
[53] Interviewed 9 February 2009.

yards: in the latter case, this was a rare opportunity to record an unusual construction sequence before it is completely/entirely lost.

The 2009 fieldwork in Yemen had been intended as a pilot visit aimed at assessing the state of the wooden dhow industry, and interviewing the older generation of boatbuilders about the recent past. Further, more detailed work is merited to better understand the wider material culture, skills and practices of the traditional industry of Yemen. However, a deteriorating political situation in the country has so far prevented a return visit. Given the fragility of the remaining vessels, and the increasing age of those people who built and used them, the timing is unfortunate for those wishing to record the maritime cultural heritage of the region.

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