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The Enigma of Tantura B: Historical Documentation and the Lack of Circumstantial Documentary Evidence

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Tantura B is by far the first early Islamic shipwreck to be discovered off the Palestinian coast. Scientific evidence indicates that this vessel sank some time between the mid-8th and the mid-9th centuries. Neither archaeological remains nor historical sources can ascertain its exact function and origin due to the lack of circumstantial documentary evidence. However, it has been argued that the vessel could be either a coaster, capable of entering rivers or estuaries, or a support vessel operating in the Arab fleet, *i.e.*, it may have had been used for either military or civil purposes, or both.

Key words: Islamic shipwrecks, shipbuilding, maritime law, Geniza.

There have been few Islamic shipwrecks found in the eastern basin of the Mediterranean; the 11th-century wreck from Serci Limani, Turkey, is the most famous discovery. Nevertheless, the shipwrecks from Tantura Lagoon are the most impressive since they consist of archaeological remains from the Roman through the Ottoman periods. In other words, the Tantura Lagoon, one of the few natural harbours along the Palestinian coast, is 'a cemetery of shipwrecks'. Due to the lagoon's geographical configuration, ships that wrecked there tend to be buried and preserved under a thick anaerobic blanket of sand. A survey of Tantura Lagoon in 1995 produced the remains of an Arab Period shipwreck in Trench VIII. Initial radiocarbon (C^{14}) dates for selected hull timbers, and morphological analysis of *in situ* ceramics, indicate that the vessel sank some time between the mid-8th and the mid-9th centuries.

Tantura B was thoroughly excavated in 1996. The remains spread 11.55 m by 3 m across the sea-floor and were oriented on a 145° to 325° magnetic compass bearing approximately 50 m from the present shoreline. Extant timbers comprising keel, keelson, stringers, frames, and planking were buried beneath 1.5 m of lithogenous sand in water 0.75 m deep. These articulated features were preserved, with minimal macro-biological damage from *Teredo navalis* or *Balanus amphitrite*. Subsequent data from the Tantura B shipwreck indicate that the frame-based method was employed in the construction of large sea-going vessels by the early 9th-century. Although vessel length and shape are uncertain, archaeological data for the Tantura B shipwreck (Table 1) suggest a long, flat-bottomed, shallow-draughted vessel.

The ship at hand possessed some unusual features: the floor timbers were flat; its hull maintained a unified breadth with no signs of convergence towards the endpost; the length-breadth ratio suggested some sort of 'long ship', and the longitudinal fasteners looked relatively weak compared to merchant vessels of the same period; its estimated length ranged from 18 to 23 m with overall small dimensions of the keel and keelson. It had no mortises or tenons in the hull; caulking was placed in the plank seams; all frames were attached to the keel; and iron nails were used to attach the planking to the frames. Nevertheless, it could be argued that Tantura B was not skeleton-built in the full sense, due to the absence of sufficient longitudinal skeletal strength. This information has led archaeologists to hold controversial opinions concerning the type and function of the Tantura B shipwreck, and to argue that it could have been a coaster, or a war-galley, or a sea-to-river vessel. Neither archaeological remains nor historical sources can ascertain its exact function and origin due to the lack of circumstantial documentary evidence; the Kufic inscription 'God hath the purest judgment', found on a wooden roundel, enables us to date the

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Table 1. *Essential archaeological data and remains dimensions of Tantura B shipwreck*

Archaeological remains	Sided dimensions (mm)	Moulded dimensions (mm)	Additional Descriptions
Keel	104	95	9.8 m long, made of oak, with 2 horizontal hook scarfs, the first was 300 mm long, the second 415 mm.
Keelson	122–202	157–180	7.84 m long, made of pine, rectangular in cross-section, charmed on both its upper and lower faces; the keelson served as a mast-step.
Mast heel	—	—	410 mm long, 150 mm wide, 80 mm deep.
Stringers (2)	69–71	89–92	Each was fastened to either side of the keelson; the surviving portion of the eastern stringer was 3.8 m long, the western one 5.26 m long.
Frames and floor timbers (15)	95.7	97	Made of pine, fastened in place; both floor timbers and half-frames were fastened to the keel with a single nail; centre-to-centre frame spacing was 260 mm, rectangular in cross-section.
Half-frames (15)	87	91	Half-frames were fastened to the keel with a single nail, though they were not cross-nailed to each other.
Planking 7 strakes on the W side 6 strakes on the E side	Width varied 40–360 mm	Thickness varied 25–34 mm	Made of pine except for strake 6 (100 mm wide and 85 mm thick), which was probably of oak and functioned as a bilge wale; fibre caulking was found in the planking seams.

vessel precisely to the early 9th-century. Nonetheless, the options offered by archaeologists can certainly be justifiable especially when all three proposed types of vessels could ply both in the Mediterranean and on the Nile (Wachsmann and Raveh, 1984; Wachsmann, 1996; Wachsmann and Kahanov, 1997; Wachsmann *et al*., 1997; Kahanov, 2000; Goldberg, 2004; Kahanov, 2004: 118–27). Substantiating such a premise requires us to approach the subject from various angles and utilize early Islamic historical records and papyri, Cairo Geniza documents, and judicial sources.

Following the Byzantine fleet raid against the coastal town of Barallus in 53/672–3, Maslama Ibn Mukhallad al-Anṣārī, the governor of Egypt, established a year later an inland arsenal on the island of Babylon (al-Rawḍa), near Fusṭāṭ, for fear of a repeat attack on the same town or other Islamic maritime installations in Egypt, thus paralyzing Islamic naval activities in the eastern basin of the Mediterranean and exposing the coastal frontiers to Byzantine warships. Ever since, the shipyard at al-Rawda constituted a major source for building commercial and military vessels during the Tulunid, Ikhshidid, Fatimid, Ayyubid, and Mamluk periods (Fahmy, 1966: 35–50; Māhir, 1979, 311–17). In the 9th century when some of the remote Abbasid provinces became autonomous, al-Rawḍa dockyard remained the most vital supplier of warships for the Tulunid navy and the most protected naval base against any possible attack by the Abbasid fleet, which was based at the port-city of Tarsus.[1] In an attempt to hinder the advancement of the Abbasid flotilla on the Nile, Aḥmad Ibn Ṭūlūn, the governor of Egypt (254–70/868–84), 'ordered to build a fortress nearby the shipyard of Jazirat al-Rawḍa, which is also protected by a hundred military ships. ... He blocked (lit. closed) the estuaries on the great sea to prevent the vessels of Tarsus from sailing directly on the Nile from the salty sea. ...' (Maqrīzī, 1967, 2: 180; Balawī, 1939: 87; Abū Zayd, 1987: 94–5).

Undoubtedly, the previous citation substantiates the notion that military vessels could sail as far as Tarsus in the north for the Egyptian capital of Fusṭāṭ. Sea-to-river navigation was thus possible with certain types of vessels and skilful pilots with sufficient nautical knowledge and capability of sailing in both waters (Scott, 1932, 5: 81, Digest XIX, 2, 13, 2;[2] Goitein, 1967, 1: 296; Udovitch, 1978: 521–2). Like Fusṭāṭ many Islamic provincial and central capitals and administrative centres were situated in the hinterland, though a few of them were reachable by ships, such as Baghdad in Iraq, Tunis in North Africa, and Seville in Andalusia (Fahmy, 1966: 64–72; Sālem & ᶜAbbādy, 1969: 25–34; Lirola Delgado, 1993: 112–20; ᶜAwwād, 1994: 296–9, 304–09).[3] Furthermore, documentary evidence proves that the headquarters of the early Islamic fleets in the Mediterranean were located in these inland naval bases that also turned to be in the course of time hubs for merchant ships plying in inland waters as well as in the Mediterranean (Muqaddasi, 1906: 198).[4]

Besides harbouring commercial ships, inland ports also sheltered military ships, which usually

set out during the season of navigation to protect the Islamic coastal frontiers on the Mediterranean against hostile attacks (Balawī, 1939: 87; Kindī, 1912: 156–7, 287; Abū Zayd, 1987: 91–5). Ibn Mammātī (544–606/1149–1209), the Ayyubid *vizier*, reports about Egyptian commercial vessels and warships sailing from al-Rawda to their destinations and designated naval bases on Mediterranean at the beginning of the navigation season and states: 'In the month of *Baramhāt*[5] ... which coincides with the beginning of the spring, commercial ships sail out into the salty sea [the Mediterranean] from the Egyptian districts[6] to the Maghrib and Byzantium. During this month [the government] looks after concentrating the garrisons in the protected frontiers, and preparing the victorious battleships to defend them'.[7] Ibn Mammātī—like other native Egyptians, Muslim chroniclers, and Geniza traders—distinguishes between *Baḥr al-Nīl* (the Nile Sea) or *Baḥr al-ᶜAdhb* (Sweet Sea/Water), and *al-Baḥr al-Māliḥ* or *al-Milḥ*, (the Mediterranean) (Minhājī, 1955, 1: 94–5, 293–4; Ṭaḥāwī, 1972, 1: 266–7; Qarāfī, 1994, 10: 355; Nuwayrī, 1969, 1: 2, 104, 171, 188; 2: 35, 106, 235–6, 243, 254; 3: 59, 173, 204; 5: 161, 175, 288; 6: 3, 142, 375, 400; Maqrīzī, 1967, 2: 143, 145, 150–1, 180; Ibn Mammātī, 1943: 247–8). Similarly, letters of merchants from the Geniza documents refer to the Nile as *al-Baḥr* (the Sea) (Gil, 1997, 3: 885, TS10 J18, f.16, l.11), or *Baḥr al-Nīl*, so that when a ship passed from the Nile into the Mediterranean the sender pointed out: 'It went out into the salty sea (*al-Baḥr al-Māliḥ*)' (Goitein, 1967, 1: 474, ENA1822, f.7, l.21). In another business letter the sender explicitly distinguishes between sailing on the Nile and the Mediterranean by saying: 'I wish to make a little business trip from Alexandria and sail into the salty sea next September' (Goitein, 1967, 1: 296, 474, ENA1822, f.7, ll.20–21). Concerning letters written in Hebrew, the writers referred to the Nile as *Yam* (Sea). A Jewish merchant, writing in eloquent Hebrew, describes how his companion suffered a hazardous voyage on the Nile: 'He endured great hardship on the Yam' (Goitein, 1967, 1: 474; Mann, 1970, 2: 108, TS13 J20, f.13, l.10). *Yam* in this context signifies the Nile since the traveller proceeded from Fusṭāṭ to Ṣahrajt, a town on the eastern arm of the Nile.

Written evidence confirms that certain types of vessels designed for military and civil services could make their way from the Mediterranean ports up the Nile and deliver their shipments directly to Fusṭāṭ and Cairo instead of Alexandria.[8] This should not be interpreted as if every pilot was capable to navigate his craft on the Nile or its arteries. Sea-to-river navigation was generally restricted to certain types of crafts whose captains and pilots possessed sufficient nautical knowledge to sail in the sea and on rivers alike (Goitein, 1967, 1: 296; Udovitch, 1978: 521–2), a practice that, as will be discussed subsequently, had been familiar to Roman and Byzantine skippers (Digest XIV, 1, 1, 12; Digest XIX, 2, 13, 2). Entering the Nile through one or another of its estuaries was extremely hazardous for an unskilled pilot or an unprepared and an improper craft (Goitein, 1967, 1: 319; ᶜAbbādy & Sālem, 1981: 229–42). Despite the maritime supremacy of the Crusaders during the 12th and 13th centuries, their attempts to capture the Egyptian capital Cairo-Fusṭāṭ failed owing to the structural design of their vessels and the unfamiliarity of their pilots and sailors with the Nile. Only experienced pilots navigating appropriate vessels could make their way from Syrian ports in the early spring to Damietta or Tinnis then proceed down the eastern arm of the Nile to Fusṭāṭ.[9] Likewise, we read about ships sailing from Fusṭāṭ along the Nile's western arm to Rosetta and then continuing in their ways to al-Mahdiyya and other destinations along the Mediterranean coast (Udovitch, 1978: 521–2; Ben-Sasson, 1991: 536–7, TS8 J20, f.2, ll.10–12).[10] It is not rare to find out in the Geniza letters about ships arriving from the sea and advancing their journey on inland waters and vice versa.[11] A letter from Jerusalem to Fusṭāṭ reads: 'You mentioned in your letter that people travelled this year from Alexandria, but here they say that the ships of Ibn Abū ᶜAqīl[12] set out from Old Cairo'.[13] According to the report from Jerusalem, just quoted, they must have gone that year from a port on the Palestinian coast via Damietta or Tinnis and the eastern arm of the Nile to Old Cairo, and were expected to set out from there to Alexandria and the West (Maghrib) via the western arm of the Nile.

During the 10th and 11th centuries the Fatimids maintained strong political and commercial ties with the Maghrib, including Sicily, and opened the markets of Cairo before merchants coming from the West.[14] It was during the 11th century, when the 'Commercial Revolution' took place and Europe was recovering from its Dark Ages isolation. This recovery was facilitated by contacts with the world of Islam, where Spain and Sicily formed bridges between the Islamic East and Christian West.

Sicily, in particular, enjoyed friendly relations with Fatimid Egypt, both under its Muslim rulers until 1060,[15] and then, on its conquest by Roger de Hauteville, a Norman dynasty which admired and encouraged Islamic civilization. Trade in the island remained largely in Muslim hands. In the course of the 9th and 11th centuries, the Arabs introduced sugar cane, flax, olives, and the cultivation of the silkworm into Sicily. The Egyptian contribution was reflected in the introduction of the papyrus plant, whose fibre provided cordage for ships (Dūrī, 1980: 170–2). Sicily, on the other hand, supplied wheat to Egypt, so that the Sicilian vessels, in times of a low Nile, sailed upstream the river as far as Fusṭāṭ and unloaded their consignments in the Egyptian capital (Goitein, 1971: 15). During times of political tranquility, military ships were put into civil service and transported commodities between Old Cairo and Sicily. On one occasion, a letter dated September 1050 describes the arrival of a warship (*harbi*) in Alexandria carrying merchandise from Sicily and then proceeding from Alexandria to Fusṭāṭ (Mosseri, L86 (IV, 79) recto, l.4).

The Geniza merchants' unique preference for transporting shipments from inland ports directly to Mediterranean harbours without making any intermediate stopovers results from various factors. First, the transfer of cargo from a river-craft to a sea-going ship would cause merchants to incur additional expenses for the hiring of porters, sailors, shipowners, and for port fees—especially if the ship had to make frequent stops in multiple harbours; transporting cargo in a single vessel from the inland port of origin to the coastal destination usually proved cheaper (Goitein, 1967, 1: 319; Shammākhī, 1970: 3: 580–81; Wansharīsī, 1981, 8: 300). Second, the merchant might incur financial losses if part of the cargo were damaged or stolen during transhipping. Third, he might miss the season of navigation, particularly when the transfer of cargo took place at the end of the sailing season. A natural disaster might delay the voyage until the beginning of the next sailing season (Kindī, 1983, 21: 153; Rustāqī, 1983, 12: 295; Ṭāher, 1983: 44; Ibn Rushd 1984, 9: 78). The fact that a Geniza merchant preferred to charter a single design of dual-capability vessel (sea-to-river) explains the rare mention of riverboats in these records. By contrast, the Digest and Islamic judicial and historical references qualified ships into different categories (Scott, 1932, 4: 202, Digest XIV, 1, 1, 12; Minhājī, 1955, 1: 94–6, 293–4; Ṭaḥāwī, 1972, 1: 266–7; Qarāfī, 1994, 10: 355; Dujaylī, 1912–13: 93–106, 198–205, 393–402; Stern, 1962: 175–6; Zayyāt, 1949: 321–64; Barrāwī, 1948: 282; ᶜAbd al-Fattāḥ, 1986: 160).[16]

Romano-Byzantine legal *dicta* confirm that certain types of merchant vessels operated by experienced pilots could make their ways on inland waters so long as they were not overloaded. The Roman compendium which goes in the *Corpus Juris Civilis* under the Rhodian Law of Jettison [Digest XIV, 2, 4, 1] corroborates the notion of hiring a dual-capability vessel to convey a shipment by sea and on a river. Callistratus rules concerning a ship that could not enter the river and anchor at its final inland destination and a part of its consignment was damaged in the transhipping process:

> 'If, for the purpose of lightening an overloaded ship because she could not enter a river or reach a harbour with her cargo, a certain portion of the merchandise is placed in a boat to prevent the vessel from being in danger outside the river, or at the entrance of the harbour, or in the latter, and the boat is sunk, an account should be taken between those who have their merchandise preserved on the ship and those who lost theirs in the boat, just as if the latter had been thrown overboard. Sabinus also adopts this view in the Second Book of Opinions. On the other hand, if the boat is saved with part of the merchandise, and the ship is lost, no account should be taken with reference to those who lost their property in the ship, because jettison necessitates contribution only where the ship is saved' (Scott, 1932, 4: 209, Digest XIV, 2, 4).[17]

On more than one occasion Romano-Byzantine lawyers discuss the legal consequences of a lessor, who cannot fulfil the contract terms and transport the goods on rivers. The law dictates upon the lessor to provide a particular vessel or offer his services to transport a fixed quantity of cargo from one point to another in the same state admitted and registered in the bill of lading in the port of origin. Where the leasing agreement requires the lessor to transport cargo by sea and then ascend the river to the designated port of debarkation, the lessor will have, in the first place, to recruit a skilful and trained pilot to navigate the vessel on the river. If the shipmaster fails to employ such a pilot and part or the entire cargo is lost at the mouth of the river or somewhere *en route*, he will be held liable for the losses incurred to the lessees. They will be

entitled to bring an action against him and seek compensation due to his navigational misconduct (Scott, 1932, 5: 81, Digest XIX, 2. 13, 2). Furthermore, Romano-Byzantine lawyers draw two distinct legal solutions in case the ship is unable to enter and ascend the river. In the first instance the shipmaster shall have to transfer the cargo to another craft. However, if the cargo is lost at the mouth of the river, the first master will be responsible for the losses. The second legal opinion proposed by Labeo rules that if the shipmaster is not guilty of negligence, he will not be liable. Nevertheless, if he acts against the consent of the cargo's owner, or transfers the cargo at an improper time, or loads it in a vessel, which is less seaworthy than his own, an action on hiring can be brought against him (Digest XIX, 2. 13, 1).

By the same token, Islamic *fatāwī*s (jurisprudential inquiries/*responsa*) treat under the title of *ijāra* (leasing) issues pertaining to sea-to-river navigation. Arguments arise between the parties to the contract when a lessor, who has come from the sea, cannot enter the *khalīj*[18] due to shallow water, or strong streams at the mouth of the canal, or robbers/pirates lurking somewhere on the *khalīj*. In such situations Muslim jurists rule as follows: If, after covering part of the course, the vessel comes to a standstill owing to shallow water, the lessee shall have to pay the lessor proportionately to the distance covered. If the shipowner assumes that he is committed to convey the cargo, and therefore he charters a vessel and brings the lessee to his ultimate destination, then no payment is due to the shipowner because it is within his right not to do. If the vessel comes to a halt at a location where no one can be found and where no authority exists, but the shipowner fears loss of cargo and so he subleases another ship, he will be entitled to collect the whole fee. Where a lessee hires a vessel for some town, but upon covering half the distance he is informed that he cannot enter into his intended destination, in such a situation the lease will be abrogated and the shipper shall indemnify the shipowner in accordance with the distance traversed. Others enact that if, after reaching mid-way, the lessor discovers that he cannot enter the destination therefore heads back for the port from which he has sailed, the lessee must pay half the transportation charges for the outward-bound trip and a comparable fee for the return trip (Ṭāher, 1983: 21–22; Ibn Abī Zayd al-Qayrawānī, 1999, 7: 100–102, 109; Jazīrī, 1998: 228; Ibn Rushd, 1984, 9: 63–5, 132; Qarāfī, 1994, 5: 485–6).

By all accounts one may justifiably infer that certain types of commercial and military ships could ply on the Nile and the Mediterranean waters. Yet, the cardinal question a reader may address here is: What was the most famous type of dual-use vessel, which is frequently mentioned by the Geniza merchants and Muslim chroniclers that simultaneously sailed by cabotage and on the Nile? Put differently, what was the vessel, which could function as a river craft, a coaster, a seagoing vessel and that sailed on inland waters of Egypt and frequented the Syro-Palestinian coasts? Hundreds of letters of Jewish traders from the Geniza evince that the *ᶜushārī* was the most prevalent type of ships, which was constantly sighted on the Nile and off the Levantine and North African shorelines. An account written around 1060 by Salmān al-Ḥarīrī (Ramle) to Nahray Ibn Nissīm in Fusṭāṭ reports about the shipwreck of the *ᶜushārī* he sailed on off Caesarea coast:

> 'We set sail [in Tyre] for Jaffa, the port of Ramle. However, a wind arose against us from the land. It became a storm and drove us out into the midst of the sea, where we remained for four days, giving up all hope for life. We were without sails and oars and the rudder was broken. Likewise, the sailyards were broken and the waves burst into the *qarib*. Realizing that our ship was a mere *ᶜushārī* [riverboat], small as a ferry, we cried: "Allāh Allāh". We threw part of the cargo overboard ...' (Goitein, 1967, 1: 320–21; Gil, 1983, 3: 267–71, TS8 J19, f.27, ll.3–8).

The *ᶜushārī*'s constructional, technical, functional details are attested by ᶜAbd al-Laṭīf al-Baghdādī (557–629/1162–1231), who states:

> They have in Egypt ships of many different forms and divers kinds. I have not ever seen one more singular than a kind of ship called *ᶜushārī*. It is of the shape of the one called *shabbāra* on the Tigris, but it is bigger, longer, better-proportioned, and of a more agreeable shape. These ships are laid in thick and solid planks, and they have projections in the shape of balconies of about two cubit round. Above the bridge they construct a wooden chamber over which is elevated a dome with windows, and in the daytime furnished with shutters, and which give a view over the river in each direction. There is in this chamber a private cabinet and latrines, and they decorate it in various colours, with gilding, and the most beautiful varnish. This kind of ship is made for the use of kings and great people. The chief when he embarks lies on a cushion, around him others of his company. His servants and his slaves bearing their shoulders belts and swords stand on

> the balconies; the provisions and all the baggage are in the bottom of the ship. The sailors apparently are under the bridge and in the rest of the ship, and they do the rowing without knowing anything of the passengers, and without themselves putting any inconvenience on the people of the suite. Thus the sailors and the passengers are entirely separate one from the other, each occupying themselves with that which concerns them. If the chief would be alone and separated from his suite, he enters the cabinet' (Baghdādī, 1965: 187–9).

Most of the documents from the Cairo Geniza refer to the *ᶜushārī* as a riverboat (Gil, 1997, 1: 669; 2: 545, 766, 807; 3: 25, 92, 109, 137, 234, 353, 531). However, we occasionally encounter it sailing on the trunk routes connecting Egypt with North Africa, Sicily, and the Levant (Ben-Sasson, 1991: 536–7, 540; Gil, 1997, 3: 297, 471, 501, 518, 833; Gil, 1983, 3: 267–71; Goitein, 1967, 1: 321). Such a dual-capability vessel must have had been well planned and constructed from strong materials in order to enable it to encounter the river streams and waves. Likewise, primary Arabic literature refers to the *ᶜushārī* as a dual-use vessel, which sailed on rivers, along the coasts, and on the high seas. Al-Nuwayrī and other authors list it as a lighter boat, propelled by 20 oars, which carries sea travellers and transfer cargoes from oversized galleys to the shore, and *vice versa*. Such a type was in service of the Egyptian naval force and used to carry archers (Nuwayri, 1969, 2: 233–5; Mahir, 1979: 356–7). On the other hand, the famous travellers Ibn Jubayr and Ibn Battuta report that they were saved from drowning owing to the *ᶜushārīs*; this necessarily means that it functions as a life-boat (Ibn Jubayr, 1952: 337).[19] Needless to say that navigators and crew had to be acquainted with both river navigation and seafaring. Had one of the two elements not been fulfilled, the consequences would be disastrous.

The puzzling questions archaeologists have addressed related to the type and function of the Tantura B. Kahanov, the chief excavator at Tantura, states: 'Because of its narrow, flat-floored hull shape, two possibilities were considered for the vessel: it was either a merchantman plying the Levantine coast, capable of entering rivers or estuaries; or a support vessel operating in the Arab fleet' (Kahanov *et al.*, 2004: 126). Based on primary and documentary evidence it can be concluded that the types of vessels that were in commercial and military services can be theoretically classified into three categories: riverboats which were used only on inland waters, coasters which sailed along the coasts and on inland rivers alike, and large-sized vessels which anchored only in seaports (Ibn Jubayr, 1959: 277–278).[20] Tantura B could probably be classified as sea-to-river vessel, which had sailed on the Nile as well as along the coastline. The fact neither the Geniza records nor most of the classical historical Arabic references evince any clear distinction between seagoing carriers and river craft leads us to reason that the vessel under question may have had been used for either military or civil purposes, or both (Udovitch, 1978: 522–3).[21] Taking into account the material from which the vessel was built, its constructional design, and the professional skill of the pilots who operated the vessel, our discussion has shown that some types of vessels could make their way from the 'salty sea' into inland ports, and *vice versa* (Goitein, 1968: 304; Ben-Sasson, 1991: 536, 540; Ibn Mammātī, 1943: 339–40; ᶜAbbādy and Sālem, 1981: 145–7). A variety of military ships, medium-sized commercial vessels, and other small craft, which plied the Nile route between Fusṭāṭ and Mediterranean Egyptian on the Delta, were sighted sailing on the Mediterranean westward from Alexandria to destinations along the North African and the Levantine coasts. In the light of the literary accounts, namely al-Nuwayrī's description, as well as archaeological evidence the wreck under question was most likely a *ᶜushārī*.

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Notes

1. This naval centre was established after 162/779, when the Abbasid army commander al-Ḥasan Ibn Qaḥṭaba launched a land expedition against the eastern coastal territories of Byzantium. The Abbasid fleet sailed from there for Egypt to retain the rule in this territory in 905 from the Tulunids.

2. This charter warns shipmasters not to enter into a river without being accompanied by a pilot acquainted with the region. Having ignored this instruction, the lessor will be liable for the loss incurred to the lessee if the cargo is injured owing to the navigational error of the captain.
3. The Islamic navy in North Africa was established in 89/708–9, by the governor of Ifrīqiya Ḥassān Ibn al-Nuᶜmān, who located the shipyard in Tūnis owing to its geographical setting. It is situated away from the shore and connected with the sea through an artificial and shallow channel that enabled specific types of ships to sail on it in one direction only, either in or out. A defence system of watch-towers and fortifications was constructed along the channel, as well as iron chains stretched between the banks to protect the arsenal from casual or planned attacks of enemies.
4. This source provides us with vivid details of the origin of ships anchoring in the port of Old Cairo: 'I was walking along the bank of the river one day, wondering at the great number of ships at anchor or underway, when a man accosted me, saying: "What is your country?" I said I came from the Holy City [Jerusalem], to which he replied: "It is a large city, but I tell you, my friend (May God preserve your honour), that the vessels along this shore and those that have left it for different towns and villages, are so numerous that were they to go to your native country they would be able to carry away all the inhabitants and the stone and wood so that people would say: "There was no city here"'.
5. The seventh month of the Coptic calendar corresponding to March/April.
6. Surely, the author refers to the remote and nearby Egyptian districts. Ibn al-Kindī (1997: 30), reports: 'All the cities of Egypt were reached by vessels which carried food, property and implements to Fusṭāṭ, each one conveying a cargo of five hundred camel loads'.
7. Ibn Mammātī (1943: 247–8). Concerning the role of the *thughūr* in protecting and providing assistance to commercial vessel at adversities, see Khalilieh (1999).
8. Udovitch (1978: 521–2), During the Mamlūks period, the *sulṭāns* ordered the admiral and the governors of Damascus and Tripoli to construct and rig special vessels to transport ice from Lebanon to Cairo. During the reign of al-Ẓāhir Baybars (658–676/1259–1277), three vessels were fitted for this purpose, while their number increased to eleven ships during the regime of al-Malik al-Nāṣir Muḥammad Ibn Qalāwūn (709–741/1309–1340). Qalqashandī (756–821/1355–1418), who brings this unique information, gives us further details: 'The ships sail on the sea until Damietta. From there, they continue their journey on the Nile until they anchored at Būlāq, where the ice is transported by the *sultanate* (government) riding animals to the caravansary magazines (*al-sharāb-khānāh*). Customarily, once the vessels set sail they have to be accompanied by ice-men to take charge of it during the journey; those ice-men, who had traveled by sea, should return home by the overland postal service route'. (Qalqashandī, 1913, 14: 396).
9. Muslim travellers, who experienced sailing on the Nile estuaries, warned navigators and sea travellers from entering them when the water is low, because 'when the water of the Nile rises, it pushes the salt water of the sea away [from Tinnis] so that the water is fresh for ten *farsakhs* (one *farsakh* equals 5.985 km). A vivid account of ships sailing from the Egyptian coastal frontiers into inland waters is provided by the Persian traveller Nāṣir-ī Khosraw, who, on 3 August 1047, arrived in Cairo from the port city of Tinnis on the Mediterranean shores. He reports: 'We set out for Egypt. When we reached the seashore, we found a boat going up the Nile. As the Nile nears the coast, it split into many branches and flows fragmented into the sea. The branch we were on is called Rumesh. The boat sailed along until we came to a town called Ṣāliḥiyya, which is very fertile. Many ships capable of carrying up to two hundred *kharvars* of commodities for sale in the groceries of Cairo are made there. Were it not done in that manner, it would be impossible to bring provisions into the city by animal with such efficiency. We disembarked at Ṣāliḥiyya and proceeded that very night to the city' (Khosraw, 1986: 39–40).
10. Ismāᶜīl Ibn Faraḥ al-Qābisī from Alexandria (writing around 1053–1057) reports to Joseph ha-Kohen Ibn ᶜAlī al-Fāsī in Tyre about the arrival of goods from different Mediterranean ports, including Spain, in Alexandria. The writer also asks the addressee to transport pieces of cloth of the size needed from Tripoli, Lebanon, aboard the *ᶜushārī*.
11. Thus, a man coming from Tunisia and proceeding to Old Cairo writes from Alexandria that he was unable to leave the boat—obviously because he had to keep an eye on the goods carried with him, and also that he could not unload certain consignments, as asked by the addressee, because they were stowed away in an inaccessible section of the ship. All this makes sense only if we assume that the craft was on its way from Tunisia directly to Cairo with only a brief stopover in Alexandria. See ULC Or 1080 J 35.
12. Abū al-Ḥasan Muḥammad Ibn Abū ᶜAqīl was a rich Muslim, who, in 455/1063, captured Tyre (Lebanon) from the Fāṭimīds, and became the judge and governor of the city for eight decades (455–537/1063–1143). The Geniza records, unlike the Arabic sources, show that Ibn Abū ᶜAqīl owned a fleet of commercial vessels, which frequented the ports of the whole eastern Mediterranean during the middle of the 11th century. In spite of the enmity prevailed between the Fatimids and Ibn Abū ᶜAqīl, his cargo ships sailed as far as Cairo, and in certain circumstances they anchored in remote areas carrying crops and cargoes to destinations on the Mediterranean. Moreover, we also learn that the economic situations prevailing in Egypt during the second half of the 11th century had worsened, a factor that may explain why the Fatimids could not defend their coastal frontiers from the Crusaders by the end of the 11th century (Tadmurī, 1978: 247–9).
13. TS8 J19, f.9, ll.13–15 [doc. no. 55 in the Archive of Nahray]. This letter is addressed by Yisrael Ibn Nathan to Abī Yaḥyī Nahray Ibn Nissīm, ll.13–15.
14. Goitein (1971: 14–16) reports that in Alexandria and Fusṭāṭ, the Sicilians formed colonies and communal organizations, which dealt with various affairs related to Sicilian merchants in Egypt.
15. Khosraw (1986: 43) 'One of the islands in this sea is Sicily, which can be reached from Egypt in twenty days. ... Every year a ship goes and brings tribute to Egypt. They bring very fine linen and striped stuff from there, one piece of which is worth ten *dīnārs*'.
16. Digest XIV, 1, 1, 12 refers to ships designed for freight and for the transportation of passengers. The edict further rules that a lessee must bear in mind that there are ships 'adapted to river navigation, but not suitable for the sea'. As for the Muslim world, Egyptian jurists like al-Ṭaḥawī, al-Minhājī and others distinguish between seagoing and river craft

(*marākib al-baḥr al-milḥ aw al-ᶜadhib*/those of the sweet sea and the salty sea), and points out that the design and structure of coastal craft and seagoing vessels differs from those restricted to river voyages. Notwithstanding, al-Nuwayrī and al-Maqrīzī classify the types of vessels used in Egypt into two groups: warships, equipped with fighting men and weapons for waging wars against the enemy, and commercial ships. They further subdivide commercial ships navigating the Nile into three subcategories. First, boats known as *al-nīliyya* or *al-nahriyya* sailed primarily on rivers and artificial channels; such vessels were used to transport crops and cargo between Upper and Lower Egypt, and between Qulzum (Clysma) and Fusṭāṭ. Second, ferries that carried passengers down the Nile for pleasure and entertainment, which are referred to as *marākib al-nuzha wal-tafarruj*. The final category consists of sea-to-river vessels that are propelled by both oars and sails and adapted technically to sail under different conditions. These vessels transport cargo exclusively from inland cities along the Nile to the seaport cities of Islamic Mediterranean (Nuwayrī, 1969, 2: 249–50; Maqrīzī, 1967, 2: 143, 145, 150–1, 189).

17. For the jettison of cargo in Byzantine and Islamic maritime laws, see Ashburner, 1909: ccli–cclxxxv; Udovitch, 1993: 37–54; Constable, 1994: 207–220; Khalilieh, 1998: 87–105.
18. Modern literary translation means a bay. However, whenever the term *khalīj* is encountered in Islamic legal sources, classical Muslim jurists unquestionably refer to one of the Nile's arteries or artificial waterways. For instance, the Khalīj of Shansha connecting Tinnis to Būṣīr (almost 50 miles) and the Khalīj of Alexandria connecting the port city of Alexandria with Zāwiyat al-Baḥr (almost 60 miles). In addition, the Egyptian governors, *vizier*s, and administrators had dug artificial canals for navigational and agricultural purposes. The Khalīj of Amīr al-Mu'minīn (Commander of the Faithful named after the second caliph ᶜUmar Ibn al-Khaṭṭāb) was dug by first Arab governor of Egypt ᶜAmr Ibn al- ᶜĀṣ connecting the Nile with the Red (69 miles) for the transport of sixty thousand *irdabb* (4338 tons) of wheat and corn by ships to Jār, the port city of Medīna. Another famous artificial Khalīj was dug by the Egyptian Jew Abū al-Munajjā Ibn Shaᶜyā al-Yahūdī, the Inspector of the Damietta District. The canal was inaugurated in the year 506/1112, after six years of relentless toil. Although the main purpose of the construction aimed to develop and expand the cultivated land, it was also used for commercial ships sailing between Tinnis and Fusṭāṭ (Nadavi, 1941: 446; Fischel, 1969: 87–8; Mann, 1970, 1: 215–17; Goitein, 1973: 240, 258–9; Goitein, 1967, 1: 298–9).
19. On Sunday 11 November 1184, when the Genoese vessel carrying Ibn Jubayr encountered inclement weather and rough seas, a lifeboat was lowered and some passengers were transferred to it: 'We, meanwhile, were gazing at the nearby shore, hesitating between throwing ourselves in to swim and awaiting, it might be, relief with the dawn from God. We resolved to stay. The sailors lowered the *ᶜushārī* into the sea to remove the most important of their men, women, and effects'. While on the Red Sea, the ship that Ibn Baṭṭuṭa sailed in foundered *en route*. He was rescued by the auxiliary lifeboat, *ᶜushārī* 'There was a ship there owned by a person known as ᶜAbd Allāh al-Tūnisī going to Quṣayr, and I went on board to see what state it was in, but I was not satisfied. This was an act of providence for the ship sailed and foundered in the open sea in close vicinity to Ra's Abī Muḥammad. The shipowner and very few merchants boarded the *ᶜushārī*' (Ibn Battuta, 1966, 2: 251).
20. In certain situations, large seafaring vessels even had to anchor some distance from the shore when a given harbour lacked deepwater docks.
21. Many Geniza letters show, in a state of war the government would seize commercial ships for military operations. These vessels were used either to furnish logistical support or to carry soldiers. From this fact we can infer that, with the exception of certain types of warships, the technology behind military and commercial shipbuilding was basically similar. Moreover, with the exception of certain types of vessels, there was not a structural differentiation between ships designed for fighting and those intended only for carrying cargoes. In days of peace and political tranquility warships [*ḥarbīs*] were put in civil service. The tendency toward building dual-use ships may have resulted from the commercial revolution during the eleventh-century and the involvement of the governmental circle in shipping business. We frequently read in the Geniza records that in wartime commercial ships were seized for the service of military fleet to carry religious warriors and logistic provisions.

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