**Shipwrecks**
Carlo Beltrame, Deborah Cvikel

**44. Evidence of Ancient Trade from the Fourni Archipelago, Greece**

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The underwater archaeological survey at Fourni (2015-2018) aims to identify and document ancient, Medieval, and Post-Medieval shipwrecks. The archipelago comprises 13 islands and islets in the eastern Aegean, which ancient texts referred to as *Korseai* until it was renamed Fourni during the Medieval period. The survey is sponsored by the Honor Frost Foundation, and conducted by the Hellenic Ephorate of Underwater Antiquities, in cooperation with RPM Nautical Foundation.

The 2015 and 2016 campaigns were conducted using traditional coastal survey methods to depths of 60m. They revealed remains of an unprecedented number of shipwrecks, unexpectedly highlighting Fourni-*Korseai* – a *topos* rarely mentioned in ancient literature – as an important navigational node and stepping stone for sea traffic in the eastern Aegean.

Amphora cargoes dominate the long list of newly discovered shipwrecks. The amphora types span the Archaic to the Late Byzantine periods, with amphoras originating from workshops as far apart as the Roman North African provinces and the Black Sea.

This paper presents new evidence of amphora transport based on the Fourni Underwater Survey, and compares it to the existing data from the Aegean Sea. It offers an interpretation of the ancient trade that connected the eastern Mediterranean via the Fourni archipelago.

**45. The Arduous Voyage of Underwater Research during the Recovery of the LBA Shipwreck off the Islet of Modi**

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This paper gives an overview of the ongoing underwater archaeological excavation of an LBA shipwreck off the islet of Modi (southeast of the island of Poros, Greece), conducted by the Hellenic Institute of Marine Archaeology for four field seasons. Excavation has revealed that the ship’s cargo consisted mainly of transport vessels of the same type and date – the Late Helladic III B-C period (thirteenth-twelfth centuries BC).

This paper elaborates issues of fieldwork methodology, data acquisition, recording and conservation, imposed by the environment in which this underwater site has been preserved for over 3000 years. The rugged geomorphology of the seabed and the wreck site formation process demanded exceptional effort and time for the geophysical and archaeological research of the site and its artefacts. Additionally, this paper attempts to provide insight into the ship's trading framework. It sank at a critical period, when Mycenaean palaces and their centralized economies
had collapsed, and when the rocky islet of Modi had been occupied for its geographical advantages as an important base on the maritime trade routes in the Argosaronic region and beyond.

46. Two Shipwrecks from the Islands of Leipsoi and Arkioi

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This paper presents the first results of a small-scale survey conducted off the islands of Leipsoi and Arkioi by the Ephorate of Underwater Antiquities in 2010. During the survey, two shipwrecks were discovered, documented and preliminarily recorded, one off Cape Armenistis in Leipsoi, and a second off Cape Koumaros in Arkioi. Both the Leipsoi and Arkioi island groups are situated on the maritime route from the Aegean and the coasts of Asia Minor to Constantinople and the Black Sea. They consist of a large number of smaller islands, islets and reefs, as well as many natural harbours that offer protection from the prevailing winds; all this forming a dynamic environment that favours the discovery of shipwrecks.

The Leipsoi shipwreck is located at a depth of 39 to 44m, and its main cargo consists of at least 180 Knidian amphoras of the Hellenistic period (third-second centuries BC). The Arkioi shipwreck, located at a depth of 45 to 52m, carries a cargo of architectural elements, mainly columns. The wreck can be dated to the Late Roman–Early Byzantine period (third-fourth centuries AD). The two shipwrecks, when examined in their respective historical and archaeological contexts, can add to our understanding of different ancient cargoes, and help us to draw conclusions on seaborne trade and exchange.

47. Ship 11 from Thonis-Heracleion, Egypt: Boat Sacrifice in an Osirian Sacred Lake

Damian Robinson (Oxford Centre for Maritime Archaeology, Institute of Archaeology, University of Oxford, Oxford, UK)

Franck Goddio (L’Institut Européen d’Archéologie Sous-Marine, Paris, France)

This paper analyses the scuttling of Ship 11 at the western end of the ‘Grand Canal’ in Thonis-Heracleion, Egypt. A small vessel – 10m long – Ship 11 was finely constructed of Ficus sycomorus, and had seen a lifetime of service before a plank from the keel was carefully removed, allowing it to be precisely deposited in a ritually significant location in the waterways of the port-city. Excavations of the context of the boat have revealed a range of different types of votive deposits surrounding it, many of which have clear resonance with the celebrations of the mysteries of the god Osiris, while others speak of more personal acts of devotion. Through examining the artefacts from within the depositional environment and considering the various ritual acts that they evoke, we suggest that Ship 11 was a temple vessel – most likely a votive offering – that was sacrificed to mark an important threshold in the sacred geography of Thonis-Heracleion, and became an object of continued veneration in its waterways.
48. The Routes of the Marble: Transportation of White Marbles in the Mediterranean

Carlo Beltrame (Department of Humanities, University of Ca’ Foscari Venezia, Venice, Italy)

Recent surveys of cargoes of Roman marble sunk along the coasts of Calabria and Sicily, in Italy, supported by an Honor Frost Foundation grant, have allowed us to partially review the knowledge of the trade in white marble from the quarries of the eastern Mediterranean. Systematic mineralogical, petrographic and isotopic analyses by Lorenzo Lazzarini, with the collaboration of Thalia Percic (IUAV University of Venice) on the samples recovered by the team of Università Ca’ Foscari of Venice enabled us to reconstruct the route of Proconnesian marble and to improve the dating of the shipwrecks. Proconnesian marble was sometimes transported with a small secondary cargo of other white marbles. The single blocks show a great variety in shapes and dimensions, which in some cases suggest their destination (type of building and position in the building).

3D documentation of the sites allowed us to reconstruct the scattered or partly scattered cargoes, to make a precise calculation of their weight, and to identify the main characteristics of the ships which transported these particular goods, even when little or nothing of the ship survived. Special attention is paid to the changes in the transportation system of white marble from the Greek to the Roman period, and from the Roman period to the Middle Ages.

49. Mixed Cargoes in the Western Mediterranean during Late Antiquity: The ‘Messina 1’ Shipwreck

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The ‘Atlantis 2010’ project, carried out by the Soprintendenza del Mare of Palermo, AURORA Trust, Oloturia Sub diving centre, Bimariv Edizioni and the Municipality of Messina, has investigated the seabed off the north-east coast of the district of Messina. The investigations consisted of mapping activities – both by remote sensing systems, such as side-scan sonar (SSS) and Remotely Operated Vehicle (ROV), and deep water surveys. The results of these investigations focused on the identification of three shipwrecks, designated Messina 1, 2 and 3. The recent research project Ar.Bio.Me. 2015 of the University of Messina identified the Messina 1 shipwreck at a depth of about 90m, and generated a representative record of the cargo, which is composed mainly of amphorae. Five complete amphorae were recovered, and testify to a connection between the North African area and the Iberian Peninsula, which are the places of origin of the cargo. The aim of this paper is to obtain a deeper understanding of the origin and type of the ship’s cargo. The data acquired can shed light on ancient trade connections in the Mediterranean area, on the assembly of goods from different places in the same ship, and on the existence of harbours for the redistribution of goods around the Mediterranean.
50. The Mazotos Shipwreck, Cyprus: A Preliminary Analysis of the Cargo

Stella Demesticha (Archaeological Research Unit, University of Cyprus, Nicosia, Cyprus)

Since 2007, the University of Cyprus, in collaboration with the Department of Antiquities, has conducted investigations on a fourth century BC shipwreck, located off the coast of Mazotos village, south of Cyprus, at a depth of 45m. A dense amphora concentration in the shape of a ship was already visible on the seabed before excavation. The shipwreck was almost undisturbed, and is one of the most coherent ancient shipwreck sites currently being excavated in the Mediterranean.

During five excavation seasons since 2010, only part of the ship’s cargo has been investigated, but many details have already come to light, notably concerning the different types of amphora and their sizes, contents, and stowage. This paper presents an overview of the cargo as it is known thus far, and to discuss how the new documentation techniques enhance the potential of the excavation of amphora-wrecks for the study of ancient economy and trade mechanisms.

51. A Wreck of Late Antiquity Discovered in a Bank of the Port Channel of Narbonne (France)

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Archaeological excavations carried out in the Narbonne marshes since 2006 have uncovered a harbour channel nearly 2km long. It was first created in the second half of the first century AD, and extended and maintained without interruption until Late Antiquity. A channel repair project exposed the wreck of a harbour barge used to fill a breach in one of the banks which was damaged during a climatic event. The wreck has been dated by its cargo, comprising mainly Lusitanian and North African amphoras – Almagro 50 and 51 and Keay 25.2 (African III C) – from the end of the fourth or the beginning of the fifth century. There were also several Dressel 23 amphorae from Betic. The remains of the ship measure 10 by 3.8m, and include 29 frames and 15 strakes to port, including a wale, and 12 strakes to starboard. The position of the mast step in the forward third of the hull rather than amidships is incompatible with the use of a square sail intended for maritime shipping. It supported either a cargo boom or a mast for a spritsail, or perhaps a lugsail. This vessel must therefore have operated exclusively within the harbour channel. This restricted navigational zone is confirmed by the frequency and the low quality of repairs, such as reused elements in the ceiling planking and the frames. The study of this vessel provides essential information about harbour craft. The development of underwater archaeology
over the last 50 years has provided significant knowledge of ocean-going ships and coasting vessels, but the flat-bottomed boats used for offloading seagoing vessels remain less well known.

52. A Moveable Feast… Beyond the Maritime: The Phoenician Shipwreck at Bajo de la Campana and Implications for the Orientalising Process on the Iberian Peninsula

Mark E. Polzer (Maritime Archaeology Program, College of Humanities, Arts and Social Sciences, Flinders University, Adelaide, Australia)

The evidentiary value of shipwrecks has been long espoused by maritime archaeologists, but interpretation of shipwreck evidence has focused almost exclusively on maritime matters: routes and trade, life aboard and technological aspects of ships and seafaring. However, with greater application of theoretical and interpretive frameworks, the inferential potential of shipwreck assemblages supports examination of myriad questions that go far beyond the ‘maritime’.

This paper examines two principal cargo material groups – galena (lead ore) and prestige goods – recovered from the Phoenician shipwreck at Bajo de la Campana, Spain; and associated structural aspects of the Phoenician economy on the Iberian Peninsula during the so-called Orientalising period (eighth–sixth centuries BC).

The lead ore is examined in the context of a recent provenance study of contemporary lead and silver objects found throughout the Iberian Peninsula. Lead and silver were often associated and extracted together, and the study hypothesised that Phoenician colonists maintained a sophisticated lead distribution network across the Peninsula that enabled them to control silver production, even though actual mining and refining operations were under indigenous control.

The prestige goods are interpreted within a feasting framework, with implications for colonial commercial dealings, resource procurement, and labour mobilisation. Together, these two domains provide a clearer picture of Phoenician trade involvement with indigenous Iberian communities, and the mechanisms by which cross-cultural interactions were initiated and maintained, as well as a fuller explanation for the associated culture transmission and socio-economic impact known as the Orientalising phenomenon.

53. The Maʻagan Mikhael B Shipwreck: Preliminary Report

Maayan Cohen (Leon Recanati Institute for Maritime Studies and the Department of Maritime Civilizations, University of Haifa, Haifa, Israel)

The Maʻagan Mikhael B shipwreck was discovered in 2005 by two divers who reported framing timbers, ceramic sherds and stones. This information was verified in 2015 by a sub-bottom profiler, followed by a water-jetting survey, in which fragments of wood, rope and a pine cone were exposed.

The shipwreck lies under 1.5m of water, buried under 1.5m of sand. The archaeological remains are in a good state of preservation, and are spread over an area of 10.5 x 4m, in an east-west direction. Preliminary wood species analysis indicated that the framing timbers were made of walnut (Juglans regia L.) and the hull planks of fir (Abies sp.). The various finds mainly comprised ceramic ware, including a complete LR2 amphora, and organic finds, such as ropes
and food remains. Preliminary dating was corroborated by $^{14}$C AMS analyses of wood and organic samples to the seventh to ninth centuries AD, i.e. the Late Byzantine–Early Islamic period in the region. This dating of the Ma‘agan Mikhael B shipwreck is good reason to excavate the shipwreck to evaluate its significance in the period of transition of ship construction from ‘shell-first’ to ‘frame-first’. The research is revealing new information regarding the shipbuilding technique, leading to a better understanding of its building tradition and its place in the transition.