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Improving capacity development for threatened maritime cultural heritage through the application and evaluation of a parameter framework

Katherine Recinos

Maritime cultural heritage is under increasing threat around the world, facing damage, destruction, and disappearance. Despite attempts to mitigate these threats, maritime cultural heritage is often not addressed to the same extent or with equal resources. One approach that can be applied towards protecting and conserving threatened cultural heritage, and closing this gap, is capacity development.

This paper addresses the question of how capacity development can be improved and adapted for the protection of maritime cultural heritage under threat. It asserts that capacity development for maritime cultural heritage can be improved by gaining a more comprehensive and structured understanding of capacity development initiatives through the application of a consistent framework for evaluation and analysis. This allows for assessment and reflection on previous or ongoing initiatives, leading to the implementation of more effective initiatives in the future. In order to do this, a model for classifying initiatives by ten parameters is proposed. It is then applied to five case studies featuring initiatives in the Middle East and North Africa (MENA) region. This is followed by a discussion of how conclusions and themes drawn from the examination and evaluation of the case study initiatives can provide a deeper understanding of capacity development efforts, and an analysis of how the parameter model as a framework can aid in improving capacity development for threatened maritime cultural heritage overall.

Protecting yesterday's legacy by planning for tomorrow: Maritime Spatial Planning as a tool for maritime archaeology conservation

Vera B. Noun

Since the dawn of time, man has used the marine environment and its natural resources for subsistence, as the first civilisations thrived on the interface between land and the sea. Survival turned into trade, and little by little human kind's relationship to the sea has shifted. The Mediterranean trade was a driver for growth since pre dynastic times; the Levantine sea basin particularly, witnessed what was once a platform for connectivity, both among cultural and commercial networks. Lebanon, strategically standing at the cross roads of three continents, is no exception. Its complex identity has been shaped by the sea, with coastal and maritime archaeology as witnesses to its glory. However, recurring conflicts and weakened governance systems have taken their toll on these fragile environments and destroyed many of its Underwater Cultural Heritage sites (UCH). Other obstacles facing UCH are of jurisdictional nature, and involve multiscale governance processes. Moreover, increasing maritime activities and economic growth are among the main directs threats to the preservation of UCH. Maritime Spatial Planning (MSP) emerged as a multidisciplinary tool within the EU Integrated Maritime Policy framework, seeking to resolve and prevent conflicts among maritime activities, whilst supporting environmental conservation and sustainable economic development. This presentation aims to address the role that MSP can play in the conservation of maritime archaeology: What are the obstacles impeding the process? What are the MSP tools that can be used to prevent further damage to UCH? Examples from the East Mediterranean will be used to illustrate these topics.

Deep-Sea archaeology in the Exclusive Economic Zone (EEZ) of 'Cyprus'

Achilleas Iasonos

It is a known fact that conducting deep-sea surveys beyond Territorial waters for investigating Underwater Cultural Heritage (UCH) is, in a sense, unfeasible, too expensive and rather inconvenient. Due to these constraints, maritime archaeology research has largely been focusing on more 'convenient' and 'accessible' waters such as the Territorial Seas. This is unfortunate when considering that UCH finds, in areas such as the Exclusive Economic Zone (EEZ), or even beyond such as 'The Area', either remain unexplored, or are under threat by illegal salvagers and other commercial-sector companies. Regardless, though, in this study it is my intention to argue that is possible to conduct research, and hence disclose new and unpublished information regarding UCH sites in the deep-seas, by taking advantage of datasets which were already produced by the oil and gas industry, and other commercial sector companies. In my opinion, this approach has not been exploited to its full extent yet.

What Killed Nile Sailing Boats: A Study of Contemporary Traditional Maritime Cultural Material

Ziad Morsy

The Nile was considered the highway for trade and population movements since the early days of Egyptian civilisation. During the riverine transportations history of Egypt, a large number of boat types have been used. From the early depictions of sailboats, Egyptian boats have gone through massive reconfigurations that changed their shape, building materials, and rigging techniques.

This paper will focus on the final huddle of cargo boats on the Nile. The presentation is part of an HFF funded studentship at the University of Southampton focusing on the boatbuilding traditions from the late 18th century up to modern day Egypt. It will aim at presenting the early development of the different types of boats, and will trace the evolution of their hull shape, hull material, and rigging techniques during the past 200 years, through the examination and study of photographic evidence and Euro-American writings during the period of the study. The researcher will present different resources of information, different methodologies, and the future of the research. The paper will also investigate the surrounding social, economic and environmental aspects that affected the evolution of these boats, and theories about the extinction of wooden sailboats on the Nile.

The evidence for the penetrating technique in ancient Egyptian shipbuilding from the foreign practice to local practice to fasten ships in ancient Egypt

Marwan Osman

The Egyptian civilization witnessed a development in the shipbuilding industry. When the Egyptian builders decided to build boats, they considered first whether it should be possible to assemble and dissemble the boat, and if they need to fasten all components and never disassemble them again or fasten them with the consideration that they be removed at some point. In both cases, there are many people in maritime archaeology that considered the idea of penetrating which used pegs to fastening mortise and tenons into the hull, was a foreign practice in shipbuilding, not a local technique depending on the iconographic scene from tomb of Qaha at Deir el Medinah (Ramses II), which shows pegs penetrating the hull which refer to the new kingdom (1570-1070 B.C) and there is no other evidence before this period in Egypt. But after the excavation at Wadi Gawasis, archaeologists discovered pegs in a part of hull remains which refer to the middle kingdom (1991-1668 B.C). We don't have any evidence from the Mediterranean before what we have in Wadi Gawasis in the same period. So, after this evidence in Egypt and after the absence of definitive evidence from other countries showing that they used the penetrating technique (pegs), Egypt has become a leader in the use of this method in shipbuilding traditions. This paper will discuss the originality of the penetrating practice and its fastening technique through the archaeological evidence of the excavated ancient Egyptian ships from the middle kingdom to the late period.

Propulsion and Steering Devices in the Egyptian Boats and Ships since the Old Kingdom to the End of the Ptolemaic Dynasty

Ossama B. Eldamanhoury

Ancient Egyptians were able to build boats of all types since the pre-dynastic ages and during the different Dynastic ages, and reached the best development stages in the New Dynasty age. The ancient Egyptian used the propulsion and steering tools to steer the ships either by the multi-paddle or the sail. Historians demonstrate that Egyptian sailboats and sailing ships appeared in the Egyptian civilisation since pre-historic ages. The evidence of this fact is the existence of some words in the Ancient Egyptian language containing some signs of sailboats and some others of different types and shapes of sails. Propulsion and steering tools differ in terms of function. The development of ships manufacturing and the Ancient Egyptian's experience in this field led, consequently, to the development of ships manufacturing and employment of propulsion and steering tools since the pre- dynastic ages till the end of the Ptolemaic age. This study explores the significance of propulsion and steering tools in Ancient Egypt throughout the historical successive periods. It also studies the employment of these tools in propelling and steering the Egyptian boats and ships, highlighting the development stages, the sizes and shapes of these tools and their manufacturing methodology. This will lead to demonstrating that Ancient Egyptians were of the pioneering peoples who knew ships manufacturing and building, showing excellence and creativity. Propulsion and steering tools played a significant role in propelling and steering Egyptian warships since the Ancient Egyptian used ships and boats in transporting soldiers in ancient history.

Ship-shape: Reframing Model Boats

Mark Dolan

Ship and boat models are oft cited in discussions about maritime archaeology: from naval architecture traditions and construction techniques to ship typologies and propulsion methods. This trend is predicated on an assumption that boat models are representative of full size contemporary watercraft. On occasion they have even been discussed as no more than scaled-down, functionally defunct boats. Some studies, on the other hand, do claim to recognise models' potential societal roles outside the basic representation of ships. However, rather than critically engaging with all aspects of these objects, many scholars (e.g. Westerberg 1983; Johnston 1985; Basch 1987; Dixon 2017) have glossed over interpretive caveats (e.g. provenance; pre-depositional use-life etc.), in favour of vague and reductive, but conveniently easy, categorisations of the models as, for example, 'grave goods', 'toys', or 'votives'.

This paper examines the way maritime archaeologists engage with boat models from the archaeological record. Focusing on terracotta boat models from Late Bronze Age and Iron Age Cyprus, it begins to explore the multivariate ways researchers can, and should, think about such objects. By approaching the models as ceramic vessels, as figurines, and as active social agents, we can move past a simplistic and ultimately unhelpful view of these objects as merely poorly rendered technical models. Instead, they can be placed within a complex holistic view of maritime culture on Cyprus, bringing the island's people into focus alongside the ships themselves. Drawing on ideas of materiality, mnemonic agency and individual action, this paper aims to open doors to interpretative avenues that have too rarely been knocked on.

Ancient Egyptian Ship and Boat Models: Between Theory and Experimental Simulation

Nesrine El-Galy

Ancient Egyptian art is wealthy with inscriptions, depictions, and monuments. Tracing and analysing their art can provide solid chronological framework and historical literature. Identifying what the ancient Egyptians referred to could be challenging and problematic. The gaps in historical texts were sometimes too brief to be precisely understood or had missing parts. And although the archaeological discoveries may reveal some answers and facts, sometimes they are highly questionable. Through dynasties, ancient Egyptian artist technology spin continued progressing. In addition to the two-dimensional inscription and depictions, they succeeded in creating three-dimensional objects. The industry of models' miniature helped to force the artists to demonstrate different aspects of the ancient's Egyptian life. The aim of my study is to understand the ancient Egyptian ritual practices that involved ships and boats models inside tombs as a votive miniature. Thus, tracing the evidence of how the ancient Egyptian modelers imitate building real ships and boats could be attained. Recent effort to combine personal observation and record Ancient Egyptian boat models to reveal the characteristics of their hulls have focused on archaeological data for hull design, structure, and stability. Based on the outcome of the selected models in the research, it was concluded that from the theoretical point of view all models are seaworthy. They had been created to scale except for the draught, which is much shorter. This study facilitates a future naval architecture study through investigating the performance and stability of ancient Egyptian vessel models.

"Phoenician amphorae" into Cypriot City Kingdoms era (Cypro - Archaic to Cypro - Classical) — Signs, terms, trade and questions

Christiana Christodoulou

The topic which will be presented is the "Phoenician" amphorae in Cyprus during the Cypro Archaic and Cypro-Classical periods. In general, the contacts between two areas are more visible through the trade goods, like the "Phoenician" amphorae in Cyprus. The majority have been found intact in the tombs at the centre of the heart of Cypriot Kingdoms, known as the necropolis of the Cypriots polities; few intact Phoenician amphorae were found at the periphery of the Kingdoms.

Necropolis publications characterised that type of amphora with different terms, such as pithos, jar and amphora. Few numbers of amphorae were found with Phoenician inscriptions on it; such information might inform us about the trade products or the "political" situation between Cyprus and Levant.

Finally, the aim of this dissertation is to answer some of the research problems related to Cyprus about the trade between these two periods and the "Phoenician" presence in the island.

From Black Earth to Blue Sea: The Story of Stone Anchors that Belong to Alexandria's Grain Ships

Orhan Serdar

The excavations of the Theodosian Harbour brought to light 37 well-preserved shipwrecks and their valuable bearing objects, exposing important aspects of the Byzantine life and culture. The Theodosian Harbour was built to import commercial materials necessary for expanding city (Müller-Wiener, 1994: 8-10; Magdalino, 2000: 210-11). The massive quantities of grain were shipped from Alexandria to Constantinople to sustain the growing population of the capital (Mango, 2000: 190). The archaeologists of the Istanbul Archaeological Museum found 37 well-preserved Byzantine shipwrecks on Theodosian Harbour dating to between 5th -11th century (C.Pulak, 2015). Since an alluvial layer of Lycos river has covered the 37 shipwrecks, they were brought to light with various other finds during the excavations. The archaeological site shows that different unknown aspects of the Byzantine life and culture. The archaeometric techniques used in this project enlightened our work that held for provenance analysis of these ships that were carrying grain from Alexandria to Constantinople (Mango, 1986: Magdalino, 2000). Determining the origins of the marble anchors will lead us to the origin of these shipwrecks, while they were sailing from Alexandria to Constantinople where the ancient trade routes in Byzantine period. Since the excavation were held on one of the biggest harbour of Constantinople, the data obtained can reveal the connections between the Byzantine Imperial Capital and the cities in Levantine region in the Eastern Mediterranean.

Maritime Trade across the Eastern Mediterranean region: New perspectives offered by the study of amphorae

Stamatia Galata

Maritime trade is undeniably linked to many aspects of ancient life and was one of the main reasons for the establishment of Greek cities around the shores of the Mediterranean and Black Sea. The study of amphorae constitutes one of our most important sources in order to understand trade connections within and between the Eastern Mediterranean region. In particular, stamped amphora can help researchers to clarify commercial patterns as well as the economic and social context of the cities.

The exportation of amphorae to regions beyond the Mediterranean demonstrates the importance of maritime trade. For example, 177 stamped amphorae from Sinope are known (Boer, 2013; p. 109), 22 from Chersonesos; (Garlan, 2007, p. 143), and only 3 from Heraclea Pontica (Lund, 2007, p. 185). However, as Finkielsztjn (2011) claimed, the number of amphorae arriving alone is not adequate evidence to support a systematic study of trade between the Mediterranean and other regions, such as the Black Sea. Lund (2007) also embraces the same idea, emphasising that Black Sea amphorae played an inconsequential role in Mediterranean trade.

Consequently, there is a need to begin systematic recording of the trade in amphorae in order to begin mapping exchange patterns as one of the main archaeological methods for my research. Visualizing the distribution of amphorae during different periods, not only has the potential to define temporal changes in trade behaviours but also, reveals commercial patterns, networks and contacts between cultures or even the relationships between distant geographically isolated groups of Mediterranean and Black Sea. An open discussion will provide the opportunity to develop this subject further and discover new perspectives.

What can maritime iconography tell us about the changes in the Late Bronze-Early Iron Age transition in the Eastern Mediterranean?

Rocío Mayol Sánchez

Multiple representations of seafaring activities and boats during this period have been found on painted pottery, terracotta boat models, carved on ivories, embossed in metal plaques, painted on tombs, incised on reliefs on the wall panels of palaces and on the walls of rock shelters. Once we define the criteria to identify an iconographic representation as 'maritime', we can analyse and compare case studies and build a maritime iconographic corpus database. This preliminary study looks at representations made of different styles, materials and techniques under a comparative approach and interrogates what they reveal about the societies that painted, carved or modelled them. The Levant, Cyprus and north of Mesopotamia form a comprehensible study area that is integrated in the Phoenician trade routes. We can compare the study cases and wonder why the period between 1300-600 BC was so important in the shaping of the Mediterranean connections. How was the Mediterranean Sea and its increasing connectivity perceived and represented by the people who inhabited it? How did they represent their beliefs systems in relation to the sea? What can we learn from museum objects, archaeological sites, shipwrecks and rock art?

Provenance Studies of the Ballast Stones Found in the North Bay of Tel Dor, Israel

Amanda Holdeman

Ballast stones were used in ancient ships as a means to ensure stability throughout the ship's voyage. To be correctly used, ballast weight was variant as it was dependent upon the movement of cargo. Due to this variability, ancient harbours contain stones that would have been discarded and saved for trading vessels. By determining possible origins of ballast, routes sailed by ships coming to and from a harbour can be recreated. Prior to this study, ballast stones were examined in the context of shipwrecks and had not been utilized as a source of information for a harbour, in regards to a harbour's function in a trade network and ancient harbour's ballasting practices. In this study, ballast stones were collected from the North Bay of Tel Dor, Israel in order to determine their possible origins using a combination of Fourier Transform Infrared Spectroscopy (FTIR) and thin-section petrography to identify the origins of ballast stones within the region. These laboratory methods used jointly are still new to the study of geological artefacts. Additionally, by examining typological characteristics of these stones, inferences on the act of ballasting in a harbour setting could be speculated. The ballast stones of the North Bay of Tel Dor can be categorised as indistinguishable, likely local stones, and non-local stones, hypothesized to be from Egypt, Syria, Turkey, Cyprus, and certain Aegean Islands. With these proposed origins of ballast stones, further assertions of interactions between Tel Dor and major surrounding civilisations of the region were occurring facilitated by seafaring.

Who is fishing and how? The case study of fishing communities in Cyprus.

Maria Michael

The current paper aims to demonstrate a few aspects of the ongoing PhD thesis entitled "The tradition of fishery and fishing gear on the island of Cyprus". The research intends to combine the terrestrial with the underwater archaeological data of the fishing methods from archaeological sites in Cyprus in an attempt to acquire a better general understanding of the formative phases of fisheries on the island through time. The fish bone assemblages and the iconographical and written data are a supporting class of evidence, in order to determine the development of the fishing technologies and to discover if and when the fishing activities had an influence on the economy and the daily life of the communities of the island.

Furthermore, the research aims to seek how theoretical concepts of insularity, material culture and maritime cultural landscape on the island of Cyprus can help to interpret the role the Mediterranean region and the island itself played in the cultural, technological and ideological developments of traditional fishing activities in Cyprus. Consequently, the research presented here aims to discuss the theoretical and methodological approaches, which strive to achieve the purposes of the ongoing PhD thesis and to present a broad selection of the actual evidence related to fishing activities in Cyprus.

The sea level change based on new archaeological data from south Argolis

Petavridou Alexandra

Numerous submerged structures were identified and surveyed along the littoral zone of the north-eastern Peloponnesus and can be associated with different historical periods presenting the evolution of the coastal and maritime development of the region. The majority of the finds are located in depths between c.-2.00m and c.-3.00m; including harbour infrastructures, temples, roman villas and other types of buildings and constructions. The main focus is given to the two littoral villas of the south coast of Argolis, in Hermionide region, and the neorio (shipshed) at the bay of Vidi in the Saronic Gulf. The archaeological comparative study indicates architectural and chronological correlations with other known similar structures of the wider region. In particular, the littoral hermionian villas are studied along with the villas of Heraion, Epidaure, Psifta, and Pergari, while the recently discovered neorio at Vidi is compared to the shipsheds of Aegina and Oeniades. The bathymetric study (taking into account geomorphology and local variations, where known) and the archaeo-geographical reconstruction of the littoral zone indicates a sea level rise of more than 3,06 m. ± 0.15m since the roman period.

This paper presents the results of the underwater survey undertaken for the ongoing Ph.D. research, titled "The littoral and the harbours of ancient Greece; the examples of Argolis, Corinth and the Saronic Gulf, from the archaic to roman period", and conducted under a co-direction agreement between the University Lumiere- Lyon2 (France) and the University of Patras (Greece).

Transient Trajectories: Modelling Movement in the Hebridean Neolithic

Stephanie Blankshein

The robust and varied Neolithic record of the Outer Hebrides demonstrates the strong influence of varying degrees of connectivity on local Hebridean communities. Situated on Europe's North Atlantic edge, the archipelago evokes notions of insularity reinforced by the development of a unique Hebridean material culture. Conversely its position along the Scottish Atlantic has been cited as a 'waypoint of connectivity' resulting in the concurrent adoption of more foreign Neolithic traditions. Unravelling these complexities of connectivity thus requires a refined understanding of the different degrees of movement that were occurring, both within and between islands as well as more broadly. This multi-scalar approach necessitates the use of innovative methodologies that can cope with the fluidity of movement which would have transcended not only a range of temporal and spatial scales but also environments. Utilising such a method, this paper will present least-cost pathways created in ArcGIS Pro using the latest palaeogeographic and palaeotidal data. The presented models show potential patterns of movement through the landscape and surrounding seaways which, when combined with the extant archaeological record, can be used to generate more detailed discussions of movement and connectivity during the Hebridean Neolithic.

The 'Affordance Corridors' of the Aegean: assessing the ecological value of the Aegean exposed landscapes during the Lower Palaeolithic

Peny Tsakanikou

Recent work on the prehistoric Aegean landscapes challenges the current perception of this region as a barrier during the Lower Palaeolithic. Instead, exposed terrain during the Middle and perhaps during the Early Pleistocene offered attractive lands for occupation with viable pathways towards Western Europe. Under the light of the recent palaeogeographical reconstructions and taking into account the refugial character of the wider Balkans throughout the Pleistocene and the key - location of the Aegean between Africa, Asia and Europe, a reconsideration of the biogeographical role of the wider eastern Mediterranean is being put forward. My PhD topic, lying in-between the fields of submerged landscape archaeology and human origins, seeks to explore possibilities of hominin presence, survival and mobility over the exposed Aegean landscapes during the Lower Palaeolithic. In MAGS 2018 I presented an overview of the methodological scheme implementing archaeological evidence, palaeoenvironmental proxies and spatial analyses (GIS) using the 'complex topography concept'. Specific spatiotemporal limitations such as the time depth, the variability in preservation and the general paucity of evidence over the study area along with the continental scale of analysis pause serious methodological challenges.

The concept of affordances (sensu Gibson 1986) is used here to assess the ecological value and the nature of the exposed Aegean landscapes in relation to exploitation opportunities for hominins during the Lower Palaeolithic. Suitability models for three time intervals (from ≥0.9 Mya to 0.2 Mya) have been produced allowing for the first time a synthetic reading of available evidence over time and space. New hypotheses on hominin mobility and occupation emerging from this work will be presented and discussed.

Shedding light on colonial trade and diplomacy: an analysis of Dutch cannons in Vietnam

Claire Holubowskyj

The pursuit of spices and silks from Southeast Asia drove the development of long-distance European trade in the 17th and 18th centuries. Dutch East India Company (VOC) involvement was extensive and reliant on carefully negotiated relations with local rulers. As a waypoint on the voyage undertaken by VOC ships from Batavia to Japan and a source of smuggled Chinese goods, Vietnam is a convenient proxy for relations between the VOC and local rulers. X-Ray Fluorescence and Scanning Electron Microscope analysis of a cannon collection highlight the complex and multi-faceted nature of cross-cultural contacts.

The cannons analysed represent a range of provenances: VOC made for VOC use, VOC gifts to local rulers, and Vietnamese commissions from the VOC. Analysis reveals variations in decoration and make quality that suggest political influence played a role. One cannon, commissioned by the Vietnamese, was of significantly poorer quality than the other cannons analysed, with unusual composition suggesting origins in a Southeast Asian cannon foundry rather than the Dutch Republic. By applying analytical technologies to the products of known trade relations, new light can be shed on the role of diplomacy on the complex and nuanced nature of early colonial trade.

The foculus, a lead brazier of the Imperial period: an achievement of marine engineering

Aires Simon

The presentation will focus on a case study: the foculus. The foculus is a lead brazier with thermodynamic properties invented by master craftsmen to enable efficient cooking at sea. Several items of this lead vessel have been discovered in Israel (E. GALILI & B. ROSEN among others). However, this type of lead brazier is well-known beyond the eastern Mediterranean. Indeed, the presence of two examples in France, found along the Provence Coast, one of which being recovered from a well-known shipwreck excavated in the 1990s, raises a lot of issues.

The aim of this presentation consists in describing the technical features of this strange artefact and to detail how it worked (combustible, lightning). It will also propose assumptions on its conception and realisation. It will question its occasional presence in the western Mediterranean. More broadly, this case study will shed a new light on the relationships between the eastern and western parts of the Mediterranean through a very specific type of shipboard life artefact.

Creating time: Whaleboats and maritime engagement in the Azores.

Carlos Garrandés

A variety of frameworks have been adopted in the field of Maritime Archaeology for the study of watercraft. There have been approaches like Muckelroy's, applicable to seagoing vessels in general, in relation to what he regarded as their normal activities. Others have preferred to tailor their framework to specific groups of typologies of vessels rather than by activity. It is the case of Gawronski, who focused on the ships from the Dutch East India Company.

In 2001, Jon Adams proposed an innovative model of interpretation of watercraft that also included the ship as a symbol, covering aspects such as ideology and tradition as key to understanding the immaterial elements and the social context of vessels. With this addition, he illustrated how not every aspect of a boat can be explained through physical, tangible or measurable drives such as available materials, access to technology or economic efficiency.

From this foundation set by previous scholars, my research aims to take a step further and look at the processes of creation and use of watercraft not only at specific moments but *through time*. Taking the Azorean whaleboat as an example, it is my intention to emphasize rather than the role of boats and ships at specific points in history, how their recurrent use, whether it has taken one or various forms, has been key in the creation of duration; the ties of continuity linking past and present that are central to the sense of connectedness, tradition and belonging in coastal communities.

What are the benefits of applying the CGI pipeline to heritage?

Grant Cox

3D techniques are often discussed throughout the archaeology maritime community, but frequently this tends to focus on applied capture methods such as photogrammetry and laser scanning. Rarely are these processes debated in relation to their place in the wider CGI pipeline and the consequence is that models can often become alienated from a larger digital community. This can result in an industrial disconnect and a lack of insight into what the potential can be for heritage when these skills are combined into a singular complimentary resource, or utilized to develop the archaeological practitioner.

For the past ten years I have been creating CGI archives that combine a wide range of digital data into archaeological projects and during this time have developed specialized modular and procedural workflows for the specific purpose of building content that can efficiently communicate in a variety of different ways and outputs. From this a number of different uses cases have evolved and the creative process has not only honed my own ability as an archaeologist, it has also provided a thinking platform for the team members and specialists that have been involved.

This talk will explore different parts of the CGI pipeline using a series of case studies, demonstrate why they can be useful at both a primary and interpretative level and highlight some of the specialized practices that are currently being employed to create a digital canvas that can be used to question and investigate archaeological data and solve a range of diverse problems.

Interpreting the Significance of Underwater Archaeological Photogrammetry

Persefoni Lesgidi

Photogrammetry has long been recognised as one of the greatest methods for documenting, collecting and processing cultural heritage with the first underwater photogrammetric experiments dating back to 1964, yielding stereoscopic photographs of the Yassi Ada wreck.

A project could be successfully facilitated by photogrammetry, quickly delivering information on a site and assisting the way in which a survey is conducted, thanks to the precise and effective results obtained from high-quality 3D models.

The study focused on the examination of underwater photogrammetry by examining case studies of shipwrecks from journal articles and interactive platforms in order to identify the ways archaeologists use photogrammetry underwater, along with the importance it plays in maritime archaeology. People's interpretation of archaeology through photogrammetric models was also identified. Using the Mazotos wreck as a case study analysis, supplementary information was provided on the processes followed by archaeologists when using photogrammetric methods in underwater projects, along with the way in which they then engage with the public.

The challenges and limitations of photogrammetry brought to view are multiple - dependant on many factors that will be discussed further on during the presentation, along with the actions that can be done to mitigate these problems.

Studying woodworking traces on ancient shipwrecks though digital photogrammetry

Axel Eeckman

The excavation of two ancient shipwrecks recently discovered in Croatia and studied within the research programme "ADRIBOATS – Navires et navigation en Adriatique orientale dans l'Antiquité" leaded by Giulia Boetto (CNRS, Aix Marseille University), offered the opportunity to test and develop a protocol of application of the digital photogrammetry to the study of the woodworking traces on ancient ships. The results were presented in my master dissertation within the Master on Maritime and Coastal Archaeology (MoMarch) program at the Aix Marseille University.

Firstly, I tried to study the woodworking traces recorded on the Bronze Age shipwreck of Zambratija (Istria, end of the 12th- end of the 10th centuries BC) from the analysis of the photographic and photogrammetric documentation of the shipwreck realised in 2013 before I started my research. This documentation resulted inadequate for my purpose. Given the results, I tried to elaborate a protocol of photogrammetric survey of the woodworking traces in collaboration with Vincent Dumas (CNRS, Aix Marseille University) and we had the opportunity to test it on a Roman bottom based river barge found in the Kupa river near Kamensko (1st- 3rd centuries AD).

The communication will explain this experimental survey protocol, its limits and the principal results obtained from its application to the Kamensko wreck. Although, the analysis of the traces left on the surface of a shipwreck is difficult and time consuming, it gives an important contribution to the study of the ship itself, helping to better understand its construction and giving important clues for the assessment of its chronology.

Education and Public Engagement of the Black Sea Maritime Archaeology Project

Danielle Newman

This paper will chronical the development and implementation of the education and public engagement programmes for the Black Sea Maritime Archaeology Project (Black Sea MAP), one of the largest and most ambitious projects of its kind. In 2015, scientists and filmmakers began a three- year project to uncover the impact of paleoenvironmental changes on earlier settlers to the region and to record the well-preserved shipwrecks in the region. A fundamental part of this project was an educational programme with a primary aim to recruit at risk A-Level STEM students to allow them hands on involvement in both laboratory and field work.

The programme was initially based on showcasing the different ways that science is used in archaeology and the offshore industry, science communication, and highlighting various career paths students could take. This gradually developed to include a broader legacy of public engagement and education including a public roadshow and online educational content. By working with filmmakers, public relations companies, evaluation and educational consultants and the University of Southampton public engagement unit, a unique initiative has been developed. The process of working with such a wide range of stakeholders, outside the usual fields of academia and archaeology, has been both rewarding and complicated. Ultimately, this paper aims to showcase both the huge successes of the project using both qualitative and quantitative data, as well as highlight some of the lessons learned in development and implementation.

Pirates from Space: Understanding the Curious Case of the Cilicians

Adam Dawson

The 150-year period where Cilician pirates, roamed the Mediterranean has always attracted a large amount of research from Ancient Historians. However, despite an extensive body of primary and secondary written sources, material evidence for these pirates has remained elusive. This, in turn has led to scholars asserting that it is in fact not possible to understand the phenomena of Roman-era piracy through archaeology. Given that histories about pirates are written with a great deal of political and social bias, this mean we have next to no objective data about how Cilician society functioned. While material is limited, by re-evaluating the nature of piracy in the ancient Mediterranean, it is possible to see how the Cilicians were able to exploit their position in the Mediterranean to guarantee their survival. Using a series of developing archaeological techniques including; seascape archaeology, GIS and remote sensing, to shed further light on the evasiveness of Cilician archaeology. Far from being a disorganised and lawless, it can be seen that Cilician piracy was in fact a state organised activity that played a vital function in Mediterranean economy between 186-63BC, primarily by supplying slaves to growing Roman Republic, where demand was highest.

This talk will give a brief overview of the history of Cilicia, the origins of piracy in the region and the political and economic changes, which precipitated its downfall. Using a combination of GIS and Remote Sensing, it will also be possible to see how this field could be developed.

Deconstructing and conceptualising the 'elusive' Aegean watercraft of the Neolithic - Early Bronze Age period. The case of Vathy in Astypalaia.

Panos Tzovaras

A much-debated issue in the field of the prehistoric Aegean Archaeology is the interpretation, 'reconstruction' and typological classification of the watercraft used during the Neolithic-Early Bronze Age period. Over the years, many scholars have attempted to conceive various types and define an Aegean boatbuilding tradition by implementing preconceived notions which do not reflect the realities and limitations of the Aegean realm. Thus, the methodological framework used so far is deficient since it seeks answers in evolutionary explanations which lead to over-generalisations, as are interpretations based on very limited data and unrelated comparanda.

In the light of the newly discovered boats in the rock-art of the site of Vathy in Astypalaia, recorded by the present author with photogrammetric and GIS software, this research deconstructs previous interpretations of the extant data by reviewing the past literature in addition to the whole body of evidence of the Neolithic-Early Bronze Age. Additionally, the multilevel, interdisciplinary methodological framework is proposed as the optimal one because it exploits the tools of various disciplines and incorporates aspects of context, operating environment, available material, technological realities, etc., in the overall analysis.

This framework, alongside a descriptive and statistical analysis of the evidence and a cluster analysis through morphological criteria, allows us to discern that the broad categories of the vessels existed in the Aegean Basin during the period under study through a micro and macro perspective. This output can be then further analysed through a more technologically rigorous approach by exploiting the tools offered by naval architecture.

Gendered Hulking? Maritime Abandonment Activity Reconsidered

Caitlin Jacobson

Hulks make up a significant portion of the maritime archaeological record. However, hulks are not researched as frequently or as in-depth as shipwrecks. Hulk research is marginalized while shipwreck research has developed an epistemology. There is a tendency for maritime archaeologists to group discard events together with wrecking events without processing the difference of each abandonment activity. Hulks and shipwrecks are positioned at opposite ends of the maritime abandonment spectrum because hulks represent the more or less control over a vessel's fate while shipwrecks represent the partial or complete loss of control over a vessel's fate. These different maritime events (discard and wreck) are also on opposite ends of the maritime behavioral spectrum. Maritime behavior is often neglected in pursuit of "a holistic study and interpretation of maritime remains in their own cultural landscape" (Westerdahl, 1978). Feminist empiricism provides a platform for a holistic interpretation. New versions of objectivity, challenging assumed knowledge and new strategies for data acquisition are some of the advantages of including feminist empiricism in maritime archaeological research. A feminist empirical platform is the hermeneutic of this presentation by reason that gender influences behaviour and behaviors influence maritime activities. This influence of gender to behavior to activity will be demonstrated through a survey project completed on the brigantine, Harry Herbert (HH), and the schooner, Excelsior, hulks found in Saltash, Cornwall. These hulks take part in a wider maritime seascape, which is significant to a holistic reconsideration and interpretation of hulking and maritime abandonment activity.