La Batellerie Égyptienne: archéologie, histoire, ethnographie
Études Alexandrines 34

PATRICE POMEY (ed.)

335pp., 142 colour, 61 b&w illustrations, 2 tables, Centre d’Études Alexandrines, Egypt, 2015, €40 (hbk), ISBN 978-2111298545

This is the publication of proceedings of the international colloquium ‘La Batellerie Égyptienne’ (‘Egyptian River Craft’) held in Alexandria in June 2010. Organized by the Centre d’Études Alexandrines, the event brought together many renowned researchers, mainly French-speaking, working in the field of ancient shipbuilding and navigation. The Nile was the focus of the colloquium, and, by a twist of fate, this review was written on board a ship anchored in the estuary of the ancient Canopic branch of this river.

The book is dedicated to Honor Frost, and a foreword by J-Y. Empereur commemorates her contribution to Alexandrian studies. In the Introduction, P. Pomey emphasizes that the subject of many articles is not restricted by the riverbed of the Nile, but goes beyond the great coastal lakes of the Delta. Neither is the historical scope of this volume limited to Antiquity, as it contains a lot of ethnographic material. The editor admits that this ambitious approach would produce inevitable lacunas. The volume is subdivided into three sections. The first, somewhat artificial section, contains contributions devoted to Egyptian rivercraft and Nilotic navigation during the Pharaonic period (ending in 332 BC) but equally includes communication networks and harbour infrastructure in Antiquity. It is followed by a section on Nilotic navigation and shipbuilding in the Graeco-Roman, Byzantine and Islamic periods, while the third part of the book deals with ethnographic topics.

The opening article by M. Abdel-Maguid follows in the wake of the Introduction, giving an overview of available iconographic, archaeological and textual material on Ancient Egyptian rivercraft during Pharaonic times. The author considers main constructional features and types of Nilotic vessels while illustrating the major lines of technological evolution with numerous images. Sief El-Din Gomaa presents the network of inner waterways in Egypt during the Graeco-Roman period. The author first briefly describes the geography of waterways and

main river-ports from Egyptian Nubia downstream. The geography of the Delta is given in detail and includes the position of major canals from the results of the latest archaeological research. The second part of the paper, less than one page, is devoted to the historical evolution of the network. The third part enumerates its major functions and mentions the mean duration and risks of voyages. In the reviewer’s opinion this is too voluminous (50pp.) for a paper entirely based on secondary sources, while the numerous maps are repetitive. The contribution by Bergmann and Heinzelm (in English) sums up the preliminary results of a multidisciplinary research project on the toponomy, development and economic role of Schedia, an important customs-post and port on the Canopic branch of the Nile created by the first Ptolemies. The topography of the site and constructional phases up to Late Antiquity are considered in much detail.

The second part of the book starts with two interrelated articles providing deep and captivating analysis of Ancient Egyptian rivercraft in Graeco-Roman times through papyri in one case and a single extremely rich iconographic source in the second. The first, by P. Arnaud, well-argued and written in the author’s characteristic lively style, is devoted to Nilotic freighters as they appear in papyri between 300 BC and AD 400. Arnaud underlines the immensity of the task of analysing a corpus of more than 500 chronologically discontinuous and varied documents. Moreover, the only serious effort in this direction was made almost a century ago with only a small part of the study published (Merzagora, 1929, La navigazione in Egitto nell’età greco-romana, Aegyptus 10: 105–148). The article just opens ‘several windows’ on the subject; but the reviewer finds these windows perfectly oriented and wide. It is worth noting the extensive citation apparatus which includes full original texts of the papyri discussed together with French translations. The paper begins by considering three navigational spaces of Nilotic navigation (sea, river and lake), citing numerous arguments supporting the conclusion that in Hellenistic times the Nile was perceived as an extension of the sea. Special attention is paid to the presence of large seagoing ships, in particular the kerkouros. The author shows that, contrary to the opinion that large ships came upriver during the flood (end of August or early September), documents attest that ships with a tonnage of more than 10,000 artabs (c.250 metric tonnes) came up the Nile, sometimes as far as Thebes, almost exclusively in winter (December to February), when although the water was low the wind was generally favourable. The reason is probably
purely economic. By the Roman Imperial period large ships were no longer present on the Nile, probably the consequence of deep structural transformations within maritime transport and commerce in Egypt. Proceeding to the study of ship-types in the papyri, he fairly observes that any attempt at a definite classification and evolution for ship-types on the basis of this varied material would be very risky. Administrative documents usually mention only the name of the ship, the name of its captain and its tonnage, quite sufficient for identification purposes. The author gives a detailed account of the kerkouros, then the kybaia, the baris, and six more types which are poorly attested in the papyri. These completely disappear from documents by the end of the Hellenistic period. Imperial period documents mention generic types such as ploion and skaphe, but also paktos, probably a ship of local Egyptian tradition. The author then considers several other types of the Roman period, including the ploion hellenikon which he supposes to be undecked, as well as types named by the cargo they transported. Unfortunately, the names of these types alone could yield hardly any information on their construction.

The next part is devoted to the intricate question of the tonnage of ships and their usage. The documents indicate that ships of large tonnage (more than 10,000 artabs) disappeared towards AD 200 and were replaced with those of medium deadweight. According to Arnaud, small vessels of c.25–125 tonnes were dominant on the Nile during all the periods discussed and beyond. As for construction materials, many texts witness a predilection for local wood species. In conclusion the author observes that Nilotic vessels in the papyri had a considerable tonnage in comparison to seagoing ships attested in the Mediterranean by underwater archaeology. The diversity of types of Nilotic ships, of both local and foreign traditions, was impressive, while many were employed in several areas, and probably those of fluvio-maritime type were much more common than was thought. At the end of this key paper Arnaud formulates major questions to be addressed in the future.

The same questions are considered in the next contribution, by Pomey. The nautical aspects of the famous Nilotic mosaic of Praeneste (c.125 BC) have never been studied in depth. Yet this mosaic, showing nine vessels in the context of the Nile and its Delta, is a ‘veritable catalogue of Graeco-Roman rivercraft’. After the general context of the mosaic, indispensable for better understanding the changes inflicted on it by time, Pomey proceeds to analyse the craft, taking account of and clarifying many details from later drawings (c.1630). He identifies four boats as traditional Ancient Egyptian papyrus boats. Then come types already familiar from the previous contribution. The woven paktos appears as a part of fishing scene, and the author comments on the construction of the fish-trap citing ethnographic parallels. Pomey proposes strong arguments for the identification of two types of freighters: the kybaia and the baris. He points out the kybaia’s ‘boxlike’ hull (Casson, 1971, Ships and Seamanship in Ancient World: 166–167) which, according to Basch (2008, Recherche d’une génalogie, Archaeologia Maritima Mediterranea 5: 69–81) and Rieth (2008, below) could be the origin of the type of Mediterranean vessel with a flat bottom and hard chine. As for the baris, it was recently archaeologically attested from the city of Thonis-Heracleion (Below, 2014, IJNA 43.2, 314–329). The next boat is identified as the thalamegos—a luxurious pleasure craft. Finally, numerous structural details allow Pomey confidently to identify a light undecked bireme, the only warship represented on the mosaic.

In a short note, L. Basch proposes that the large door from the temple of Sobek in Fayoum, constructed under Ptolemy III (246–221 BC) and now in the Graeco-Roman Museum of Alexandria, was probably assembled with ship’s planking. The author comments on the dimensions of the planks, corresponding closely to those of the Mataria boat (c.450 BC), on their shape, and on the remains of dovetails. The suggestion is convincing. Keeping in mind the rarity of archaeological remains of real Ancient Egyptian boats, this new piece of information is very welcome, especially as the Museum in question has been closed for many years.

The next contribution by P. Ballet and P. Pomey presents a group of unpublished terracotta figurines and lamps with representations of river ships, most often in a religious context. The figurines in museum collections at Alexandria, Haifa, Lyon, Frankfurt, Hamburg, London, Paris and Toronto are dated to the Roman period. The authors touch not only on the iconographic aspects of various gods connected to the Nile, and the religious practices associated with them, but, more importantly for the aims of this volume, provide many interesting details of the craft represented. A part of the collection belongs to a type of lamp in the form of a ship that sailors and passengers offered as ex-votos. The authors propose a typology for these ships, based on the form of the bow and the presence or absence of a deckhouse. A truncated bow clearly indicates the kybaia. As for the dimensions of the real boats represented by the lamps, the authors are inclined to see them as small vessels that were most common on the Nile during the Hellenistic and Roman periods. In conclusion, they stress the magical effect of the ritual lighting a lamp in the form of a ship, many of which are represented with cargo on board. The paper ends with a complete catalogue of the figurines and lamps discussed.

The contribution of E. Rieth, based on his 2008 publication (Géométrie des formes de carène et construction ‘sur membrure première’ [Ve-XIIe siècles]. Une autre approche de l’histoire de l’architecture
Archaeology of East Asian Shipbuilding

JUN KIMURA


Jun Kimura is one of the best specialists in this subject—the origins and diversity of watercraft construction in Southeast Asia. Based on a comprehensive audit of published shipwrecks, and a thorough understanding of the region’s history and archaeology, the author presents a taxonomy of the known watercraft and a theory of their development through contact and diffusion of techniques and behaviour. This is undoubtedly the most important section of the book, but later chapters, intended to illustrate and support the author’s theoretical approach, are in themselves a valuable contribution to our knowledge of the maritime history and archaeology of the region.

According to Kimura, the ships that sailed Southeast Asia in the Middle Ages belong to a small number of basic building traditions, notably from the Yellow Sea Chinese coasts and rivers, Korea, Japan, the East Chinese coast and the more varied and cosmopolitan South China Sea. The different shipbuilding traditions identified in the region are organized according to the geographical areas where they are built, and the cultural cross-pollination processes of hybridization by which they originated. After a short but thorough review of written sources, the author makes a strong case for the importance of detailed study and description of the structural features of watercraft, more important than their construction philosophy or even their construction sequence. Following Jeremy Green and Pierre-Yves Manguin, Jun Kimura examines and describes the technological variations of ship-construction in the region within a chronological framework, starting in the 10th century, and explains the evolution and hybridization of the different solutions, techniques, materials, and tools recorded archaeologically.

The author has divided the region into three main cultural areas: the Yellow Sea (the coasts of Korea and Japan, the Bohai Sea and Straight, Korea Bay, the southern coasts of the Shandong Peninsula, and the coast of Jiangsu Province), the East China Sea (China’s east coast south of Jiangsu Province), and the South China Sea, based on sound historical and archaeological investigation.

Kimura describes the characteristics of the vessels built in the Yellow Sea area as well adapted to the prevalent shallow waters. Flat-bottomed, they can be divided into two main traditions, characterized by the type of transverse reinforcement: bulkheads in China...
The variety of influences and hybrid vessel-types recorded in the South China Sea area are addressed in ch. 8, which also explains the cosmopolitan trade environment of the 1st millennium in both the Indian and Pacific Oceans, with foreign communities living in coastal cities and exchanging cultural traits. The final chapter proposes a new interpretation of East Asian shipbuilding technologies, taking advantage of the growing number of shipwreck finds and publications, and argues for a multidisciplinary approach, encompassing historical, cultural, ethnological, and traditional boatbuilding studies, as well as a careful look at the materials used and their sources and suppliers. Appendix 1 lists artefacts and other materials found on the Quanzhou Ship. Another offers a list of lashed-lug South China Sea ships found, and a third a list of merchant ships from the South China Sea region. The book is completed with a useful glossary, references and index.

This book is a comprehensive inventory of the known shipwrecks and a thorough study of their diversity and evolution. It is a major source of data and a seminal work for the development of the discipline, both in eastern and western scholarship. It would not be fair to say that this excellent book establishes its author as an authority in the growing world of maritime archaeology in East Asia and the India Ocean, because Jun Kimura is already a mature scholar and a respected authority in this field.

FILIPE CASTRO
Texas A&M University, USA

**Dutch East India Company Shipbuilding: the archaeological study of Batavia and other 17th-century VOC ships**

WENDY van DUIVENVOORDE


This monograph is a thorough and highly readable presentation of five years’ detailed study (started in 2003) of VOC shipbuilding through archaeology, and more specifically through the hull-remains of the Batavia. The famous VOC merchantman wrecked in 1629 on the Houtman Abrolhos archipelago off the coast of Western Australia. The wreck was...
excavated by the Western Australian Maritime Museum between 1973 and 1976, and revisited in 1980. The background to the author's research, conducted in the Netherlands and Australia, is provided in a Foreword by the excavator of the wreck, Jeremy Green. Green's detailed reports on the artefact groups as tightly dated assemblages, and his overviews of the excavations results, have become standard reference works, and the historical context and aftermath of the wrecking have been covered in a number of diverse publications. However, apart from overviews on the hull construction, details of the ship's surviving stern hull-structure awaited full documentation and publication after a lengthy conservation process. This has been eagerly awaited, as Dutch shipbuilding techniques in the earlier part of the 17th century have been poorly understood.

The chapters are logically arranged, the first summarizing the maiden voyage, the vessel's loss in the context of other 17th-century European ship losses in Australian waters, the grisly events that befell the stranded ship's company, and the rediscovery of the wreck in 1963. This is followed by a chapter looking at the history of shipbuilding in Holland and the technological developments that influenced the shipbuilding industry—in particular the expansion of powered saw-mills, which represented a huge increase in efficiency and output over hand-sawn production. This economy doubtless influenced another factor evident in the Batavia and other Dutch East Indiamen—their extremely strong construction and hull-thickness for long voyages with minimal maintenance. There is a detailed discussion of the bottom-based construction method described by Nicolaes Witsen in his treatise of 1671, and references to numerous supporting sources, including a drawing held by Master Shipwright Jan Rijcksen in a portrait by Rembrandt (1633). Cornelis van Ijk published a shipbuilding manual 26 years after Witsen (De Nederlandse Scheepbouw Konst Opengestelt) which described the frame-based construction being used in the Rotterdam shipyards by 1697. This background provides essential context for the detailed descriptions of the Batavia structure which follow.

Chapter 3 describes in more detail the circumstances of discovery of the archaeological remains, and the process of site formation. Included are the excavation methodology, and more specifically that for recording and drawing the Batavia's hull timbers on the seabed, as well as after excavation. The well-preserved transom stern was re-erected as part of the museum's display, and has become a visual icon of European contact with Australia. The challenge of reassembly of the hull in the museum gallery and the load-bearing solution for creating the display, which opened in 1991, makes fascinating reading. The method of taking the ship's lines from the reassembled hull-structure is described in detail, and issues of distortion discussed. For this study, all timbers were redrawn in AutoCAD by tracing full-scale drawings of the shape and state of the timbers directly after excavation and before conservation, and correcting them against field photographs and actual timbers.

The heart of the publication is the rigorous and detailed hull study and description (70pp.) followed by ch. 5 on the archaeology of Dutch ocean-going ships (43pp.). The hull description starts with a short construction history from documentary sources such as VOC minutes, and a comparative study of 17th-century ship dimensions. Details of hull construction are presented by element, accompanied by detailed illustrations and scientific analyses: hull-planking, nail-plugs, framing-pieces, gun-port and lid, transom planking, cat-hole, pine sheathing, layers of goat hair, paying materials, caulking material, frames, ceiling, riders, sternpost, copper sheathing, transom assembly, fashion-pieces, wing-transom and gun-port, standing-knee, deck-beams, fastenings and so on. Chapter 5 places the Batavia in the wider context of the known archaeology of Dutch oceangoing ships (50 documented VOC shipwrecks are listed). Interesting details with illustrations are provided on the 100-ton yacht abandoned in Nova Zembla during the 1596 Barents expedition, the merchantman known as Scheurrrak SO1 in the Wadden Sea, the merchantman known as Angra C, lost in the Azores, and many other sites. Batavia's hull was thick and strong—two layers of outer planking (overlapped to make them more watertight) and a sheathing of fir sealing an anti-fouling layer of cattle hair. These layers were covered by heavy framing, interior ceiling, and the hold lining. The author concludes in ch. 6 that the Batavia's shipwrights concentrated on strength, waterproofing and provision of the best protection for teredo attack, through multiple layers. Final chapters cover timber used in the hull construction, dendrochronological results, timber processing, and analysis of reconstructed ship lines and construction. Appendices provide transcripts of VOC ship-construction charters, a catalogue of Batavia shipremains with dimensions, and a short glossary of terms for dendrochronological research.

This publication represents an impressive amount of important work on a 3-dimensional primary source of information on the traditional bottom-based building practice once commonplace in north-west Europe. The combination of much original research with complementary research by others shows the value of detailed hull recording and analysis. Relatively few vessels of this type have been excavated and published with archaeological rigour—examples such as Vergulde Draeck, lost in Australian waters in 1656, are reviewed in ch. 5—and consequently Batavia is of outstanding importance in an improved understanding of the reasons for the change from traditional shipbuilding to the formulaic designs of the Early-Modern period. This well-crafted and attractive book contains a large number of high-quality colour photographs, as well
as informative technical drawings of construction, and includes wider content on VOC shipbuilding, and comparable 17th-century ships. This reviewer commends it to all readers of *IJNA*—highly accessible while maintaining rigorous academic standards. It is a "must" for anyone interested in European shipbuilding traditions of the Early-Modern period.

MARK REDKNAP

*National Museum Cardiff, Wales*


PATRICE POMEY and PIERRE POVEDA, photographs by LOIC DAMELET, CHRISTINE DURAND and PHILIPPE GROSCAUX


Although this is a small-format book it is not a minor work. It is a remarkable photographic account of an ambitious experimental nautical archaeological programme—the construction of a replica of a small, oared sailing boat in the Archaic Greek tradition of the 6th century BC.

In 1993 two wrecks, designated ‘Jules-Verne 7’ and ‘Jules-Verne 9’, were exposed in Marseille in a terrestrial context during development work in Place Jules-Verne, close to the ancient Greek shoreline of the city. The boats were excavated under the direction of Patrice Pomey, then in charge of the Mediterranean nautical archaeological team of the Centre Camille Jullian (CCJ), a research unit formed by Aix-Marseille University, the CNRS, the Ministry of Culture, and the National Institute of Preventative Archaeological Research (INRAP). On completion of the excavation the wrecks were lifted and transported to the ARC-Nucléart Laboratory at Grenoble for conservation and reassembly, and were then put on display at the Museum of the History of Marseilles.

In parallel the study of their build was carried out by Pomey and his team. This involved analysis of hull-form and construction of the two shipwrecks: one a sailing coaster (J-V 7), the other a small coastal fishing boat (mostly for coral) also used for local transportation (J-V 9). This research gave rise to a series of academic publications and papers at international conferences (ISBSA in particular). The 6th-century-BC wrecks constitute two essential landmarks in the history of the Archaic Greek shipbuilding of the ancient Mediterranean. The J-V 9 wreck, with its entirely sewn construction (assembly of planking and attachment of planks to frames by sewing with linen fibre) represents the ‘old tradition’; while J-V 7, with its partially sewn construction (mainly for attaching the planking to the frames, although the planking was assembled by mortise-and-tenon joints and nails) introduces the ‘new tradition’, that of the Greco-Roman period, of which the 4th-century-BC Kyrenia wreck is one of the most ancient and remarkable examples.

One of the ‘academic dreams’ of Pomey and his team was to build replicas of these vessels as part of a nautical archaeology programme to experiment at full scale with the ‘shell-first’ method by constructing the two boats according to the principles (conception, forms and structure) of ‘longitudinal shell-first’, and evaluating their technical capacities. The choice of Marseille, European City of Culture 2013, solidified the transformation of the ‘dream’ into the Protis Project, which allowed at least part of this plan to come to fruition. The budget (from the Provence-Alpes-Côte d’Azur Region, Marseille Provence Métropole urban community, CNRS, AMU, etc.), although considerable, was not sufficient for building two replicas. Only that of the J-V 9 wreck, named Gyptis after a local princess who married Protis, one of the chiefs of the Phoenician colonists who founded the city of Marseille, was finally built. The construction of this replica, directed by Patrice Pomey (Director Emeritus of Research at the CNRS), and co-ordinated with the shipyard by Pierre Poveda (CNRS researcher), was carried out by the CCJ. It was aided by a scientific and technical committee, under the administrative and logistical management of the Arkaeos archaeological association. The construction of the replica was carried out in the Chantier Naval Borg of Marseille, noted for its construction and restoration of small traditional Mediterranean boats.

A few notes will allow us to indicate the importance of the project, a replica built by carpenters as though the direct descendants of the Greek colonists from Phocaea who founded the city of Marseille. The main dimensions of the replica are: hull 9.85 m overall length, 1.88 m beam at the master-frame, 0.75 m depth, displacement 1.5 tonnes, of which 750 kg is hull and 750 kg pebble ballast. Construction started in mid January 2013; end of construction and official launch 12 October 2013; first sea trials mid November 2013. The shipyard team: five carpenters and professionals from the Chantier Naval Borg, volunteers and students who worked 5000 hours, of which 3000 hours were devoted to the sewing of the hull (5 km of linen thread!).

The photography in the book depicts this extraordinary adventure in experimental archaeology. The book comprises four parts: the excavation and study of the two shipwrecks (Jules-Verne 7 and 9); the construction of the Gyptis (J-V 9), from the selection of the trees in the forest to the launch of the replica; the first sea-trials under sail and oar; and portraits of the principle actors in this scientific adventure. The images, all in colour, by the three photographers of the Centre Camille Jullian, particularly by Philippe Groscau, who
tragedically died on 10 December 2014 (recognizable by their sensitivity), are distinguished both by their accuracy as technical documents, and as works of art. They record not only general views and construction details, but also gestures, pure architecture without people, and setting the scene of the ‘actors’ of the boatyard. The double-page, full-page and quarter-page photographs succeed in presenting an authentic story; in short, a superb addition to the CNRS editions.

There is only one minor criticism—the captions of these ‘photographic notes’ are not systematic, and often too short. We would like to know more! In conclusion, this is a beautiful photographic art book to browse and to admire as one does with a work devoted to a painting or school of painting. However, it is also a document of maritime archaeology of great academic interest for the study of the history of boatbuilding in the ancient Mediterranean.

ERIC RIETH
Musée national de la Marine, Paris
(translated by John Tresman)

Site Formation Processes of Submerged Shipwrecks

MATTHEW E. KEITH (ed.)
304pp., 68 b&kw illustrations, 10 tables, University Press of Florida, 2016, $79.95/£77.95 (hbk), ISBN 978-0813061627

An understanding of site-formation processes lies at the heart of all archaeological fieldwork, and nowhere more than in the investigation of submerged shipwrecks. The metamorphosis from a functioning and controlled ship to its wrecked remains as observed on the seabed today can only be understood if the processes of change between these two states are identified, interpreted, and quantified. This, together with a comprehensive record of the archaeological evidence and conclusions drawn from it, allows the archaeologist to work backwards to reconstruct, however tentatively, the ship and its wider contexts before it became a wreck. Moreover, if the dynamics of formation processes affecting a wreck are properly understood, informed decisions can be made about future protection strategies and the mitigation of specific threats.

The classic study of wreck-formation processes is still Part 2 of Keith Muckelroy’s Maritime Archaeology (1978), together with his papers in this journal (4: 173–190) and World Archaeology (7.3: 280–290). Though in some respects now outdated, these publications remain foundation reading for the topic, and such has been their wide acceptance and perceived authority that few have sought to question or develop them. An exception has been Gibbs’s insightful paper on the cultural and human aspects of site-formation processes in maritime archaeology (IJNA 35.1: 4–19). The paucity of recent publications in this area therefore makes the present volume especially welcome. As an edited collection of papers it is not, however, an integrated textbook on the subject but an eclectic mix of widely varied topics. It is no less valuable for that.

An introduction by Ian Oxley and Matthew Keith summarizes the development of wreck-site formation theory since the 1970s and the rise of associated heritage-management issues. The main content is grouped in three sections. Part I, ‘Natural Processes’, or ‘N-transforms’, is predominantly scientific and concerned with the environment. Ben Ford, Carrie Sowden, Katherine Scott, and M. Scott Harris tackle geological and geomorphological processes in maritime and riverine situations. Matthew Keith and Amanda Evans then consider the role of sedimentation, and are followed by a masterly discussion on marine scour by Rory Quinn and four colleagues from Ulster and Southampton Universities. Ian MacLeod looks at the relevance of metal corrosion and electrolytic interaction in formation processes, and considers the value of such studies in the wider interpretation of environmental dynamics. David Gregory provides a complementary assessment of wood degradation.

Part II considers cultural processes, or C-transforms. These are primarily the consequences of human action and intervention. Leaving aside the uncontrolled commercial exploitation of historic shipwrecks (surely anathema to readers of this journal), development-led impacts on the seabed are probably the greatest threat to the underwater archaeological resource. These include oil and gas extraction, renewable energy, aggregate extraction, dredging, and pipe and cable installation. Anthony Firth and Amanda Evans assess these threats and argue persuasively for their identification and avoidance, or the application of appropriate mitigation strategies. Michael Brennan similarly addresses the impacts of trawling.

Chapter 9, ‘Cultural Site Formation Processes Affecting Shipwrecks and Shipping Mishap Sites’, by Martin Gibbs and Brad Duncan, is a developed re-working of Gibbs’s 2006 article and, with no disrespect to the volume’s other authors, is the paper which shines out. It demonstrates the importance of human (and not always scientifically ‘rational’) inputs before, during, and after a shipwreck event. Were I to advise a student who wanted to obtain an overall grasp of wreck-formation processes I would recommend reading the Muckelroy trilogy followed by this chapter. Thus informed, my hypothetical student would be able to read the rest of this book from a secure foundation, and would gain much from doing so.

Part III deals with the application of site-formation studies to heritage management, which will be especially relevant to those concerned with monitoring shipwrecks and preserving them in situ. Ian Oxley

has formidable experience in this field, gained as a practising underwater archaeologist on the Mary Rose excavation and subsequently as a member of the UK government’s historic shipwreck investigation team. From 2002 until his recent retirement he led English Heritage’s (now Historic England’s) maritime archaeology service, and his paper considers the subject’s development with particular emphasis on formation-process studies as a predictive management tool.

The two following papers are interlinked, and address questions of deep-water monitoring and interpretation. They concern two deep-water wrecks from the Second World War in the Gulf of Mexico, the submarine U166 and the passenger freighter Robert E. Lee. Shortly after the U-boat had torpedoed and sunk the freighter, US escort vessels located and depth-charged the submarine. The two wrecks ended up close together, each leaving a distinctive debris-trail as it sank. Daniel Warren explains how acoustic positioning was used to identify and plot these complex patterns, while Robert Church uses these data to reconstruct the two wreck-formation processes and so interpret the course and consequences of the battle. Finally Matthew Keith, the editor, in a short and pithy conclusion, emphasizes the continuing importance of formation-process theory and its practical application in the interpretation and management of shipwreck sites. It is a mantra that cannot be repeated too often.

COLIN MARTIN
University of St Andrews, Scotland, UK

The Maritime Archaeology of a Modern Conflict: comparing the archaeology of German submarine wrecks to the historical text

INNES McCARTNEY
328pp., numerous maps and illustrations, Routledge, 2015, £90, ISBN 978-1138814356

Dr Innes McCartney is an increasingly well-known nautical archaeologist, historian, author and broadcaster. He has the diving ability to explore sites and wrecks at first hand, and the expertise to relate these findings to primary and secondary historical sources. This rare capability has put him in the forefront of modern naval historians. He obtained his doctorate from the University of Bournemouth with a major study of U-boat wrecks in the Channel area, comparing the archaeology to the written records of U-boat losses. This has now been converted into a book, which is beautifully structured, a model of academic research. The Introduction clearly sets out the methodology and historical and historiographical context. There then follow three sections, chs 2–4 on World War One, chs 5–8 on World War Two, and a Conclusion which analyses both U-boat wars collectively and the ‘lessons revealed’.

The first chapter examines the area of the famous ‘Dover Patrol’, the effectiveness of which in barring passage to U-boats has been a matter of controversy. This section is therefore of particular interest. The author found 18 U-boat wrecks in the Dover area. The first was a fortuitous and rare sinking in March 1915 of U8 using a combination of the drifting indicator-net and the explosive sweep. This and other difficulties with the nets caused the Germans to abandon passages of the straits in April 1915, but the establishment of the Flanders Flotilla of smaller UB and UC boats caused these to begin to pass the straits in February 1916; they were joined by larger High Sea Fleet U-boats in December. Not until February 1917 was another U-boat, minelayer UC46, sunk in a mine-net barrage. Deep minefields were then laid and these proved effective, especially when they were illuminated and patrolled, forcing submarines to dive down into them. U56, UB38, UB58, U33, UB55, UC64 were all sunk in this way along with UB35 depth-charged by a destroyer. UC26 rammed by a destroyer, and UB109 sunk in a controlled minefield. By September 1918 the straits were effectively closed to U-boats.

All these match the 1919 list ‘Reported Destruction of Submarines’ in the National Archives. The author has now been able to add UB78 mined in April 1918, UB31 mined in May 1918, what was probably UC79 (the author is rigorous in not claiming certainty unless the evidence is overwhelming) lost in still-unexplained circumstances off Cap Gris Nez, U37 lost in 1915 in an early minefield, and probably UC72 mined in August 1917. There are also two still-unidentified U-boat wrecks. Work on this rich wreck-site area revealed that the Anti-Submarine Department of the Naval Staff overlooked two confirmed U-boat wrecks and that neither the Dover Command nor the divers of the Royal Navy’s salvage section kept adequate records.

The author then moves further down the Channel. There are 14 wrecks in this area, sunk between November 1916 and May 1918, half of which are in the 1919 list. These were examined by the author, UB19 and UB37 sunk by the decoy (Q) ship HMS Penshurst; UC65 sunk by the British submarine C15; UB81 mined; U103 rammed; UB72 sunk by the submarine D4; and UB74 sunk by depth-charges. McCartney adds UC51 mined in November 1917; what was probably U95 certainly rammed by a merchant ship in January 1918; what was probably UC49 depth-charged; what was probably UC66 sunk by a seaplane, a significant event historically; and UB65 sunk in uncertain circumstances (probably a diving accident) off Padstow. One unidentified U-boat remains off the Lizard. A lesson from this area is the limited
utility of radio intelligence against Flanders Flotilla boats that usually maintained wireless silence. The author concludes, however, that the two submarine kills probably did use radio intelligence to vector the British boat to the right place, ‘which suggests a conscious decision to only use radio intelligence to kill U-boats when its use resided within the confines of the professional navy as opposed to the auxiliaries’.

In his conclusion on the First World War, McCartney demonstrates that the 1919 list ‘contains some glaring inaccuracies and inconsistencies’. Nine cases of U-boat destruction are ‘completely erroneous’. Overall accuracy of the 1919 list in the area of study comes out to a disturbing 48%. What this means is that in over half the cases (52%) now known, the 1919 list was incorrect in attributing the correct fate to the U-boats destroyed. Clearly any study of U-boat losses in this period that relies solely on the British version of events will not yield anything close to the true picture of events.

The situation is better for the Second World War, at least up to a point. The Channel wrecks belong to the late stage of the war in 1944–1945 when the U-boats, defeated in the Atlantic, operated in coastal waters taking advantage of snorkels to spend most of their time under water. In the first phase of this campaign special (radio) intelligence was not too bad, as the Germans had been forced to use wireless communications because of the loss of their landlines to Allied bombing. Even though transmissions from U-boats themselves steadily declined, this allowed a more accurate intelligence picture of U-boat movements to be obtained and, therefore, which boats were likely to be sunk where. In the second phase of the inshore campaign, however, this intelligence window was closed and knowledge dried up. This had very significant effects both operationally at the time and in terms of knowing identities of losses. Overall, about 60% of the U-boats sunk in the study area were correctly identified in the list of the Anti-U-Boat Division of the Admiralty produced in 1946. In the second phase of the inshore campaign this slumped to only 36%, seven U-boats out of 19. Again ‘the 1946 List and supporting historical texts for this period in particular should be treated with the utmost caution’.

In the whole inshore campaign 15 losses were inaccurately assessed, three were misidentified, two were not present and ten were ‘mystery sites’. These latter are examined in some detail. One of the most significant aspects of these investigations is the far-unrecorded importance of specially laid deep anti-submarine minefields. No fewer than three submarines, U409, U1020 and U683 (all probable identical) were sunk in this manner in the Bristol Channel. Another most interesting victim of mines was U480, one of the seven U-boats fitted with ‘Alberich’ rubber anechoic coating to reduce the effectiveness of sonar. This helped it operationally but could not defend it from the ‘Brazier’ minefield laid in its vicinity, possibly deliberately, in early 1945; it struck one of these mines and was sunk in February.

In his conclusion the author argues convincingly that his ‘overarching objective’ of the study had been met. Each known U-boat wreck which did not correspond to the 1919 and 1946 lists had been dived, recorded and, as far as possible, identified. As Dr McCartney writes, ‘This was time-consuming, taking 15 years to achieve, but there was no other way of developing a verified data-set of identified wrecks. No desk-top study could have differentiated the wrecks of two world wars from each other, nor which ones were known losses or mystery sites, with any accuracy. In cases such as this there is no substitute for actual fieldwork. By the end of the research, a verified database of the wrecks had been developed and its relationship to the 1919 and 1946 Lists could then be tested and assessed’.

Interesting revised tables of the means of destruction of U-boats were produced on the basis of this work. This demonstrates that, in the area of the study, mines sank 40% of U-boats in World War One and 35% in the second phase of the inshore campaign in World War Two. The author then makes some interesting and well-considered critical judgements about the performance of the relevant sections of the Naval Staff in the First World War. The performance of the Anti-Submarine Department (ASD) in assessing U-boat losses is considered to be ‘very poor’. The published certain losses asserted in the 1919 list were ‘as specious in 1919 as they appear today and should never have been made’. ASD ignored intelligence data when it was inconvenient, and this was known at the time. This, the author argues, tends to support adverse criticism of the performance of the Naval Staff in this period, rather than the more rosy view recently argued by some naval historians. The World War Two Anti-U-Boat Division of the Admiralty comes out better. Indeed, overall, its record of accurate knowledge of the location of destroyed U-boats was 84%, and establishing their identity 74%. When special intelligence faded, however, the result was very different.

The final two points made by Dr McCartney challenge first nautical archaeologists and then naval historians. The first is that a ‘battlefield-wide approach to nautical archaeology, where relevant, offers the potential to reveal new meanings not seen by studying wrecks in isolation’. The other quotes a recent naval World War One atlas that reproduces the 1919 list uncritically. This just will not do any more. As the author concludes, ‘This study at least ensures that the data relating to the accuracy of the historical texts of U-boat losses, benchmarked against extant archaeology, is now available to historians and other academics. It is hoped that the study makes the case for the archaeology of ships lost in conflict, where relevant, to proportionally contribute to the history of naval conflict. It shows that the result of 15 years of fieldwork has led to a dataset of the wrecks in the study area, which, when compared to official history, leads to the
emergence of a more accurate picture of the two U-boat wars in the English Channel in the 20th century).

This case is indeed more than amply made by Dr McCartney in a book that is therefore a highly significant work. It re-writes the history of the U-boat war. It also demonstrates the vital interaction of archaeology and history. This can only enrich both disciplines as well as establish the author’s stature as a leading practitioner in both fields.

ERIC GROVE
Maritime History North, Blackpool, England, UK

Azdud (Ashdod-Yam): an Early Islamic fortress on the Mediterranean coast
British Archaeological Reports S2673

SARAH KATE RAPHAEL

This admirably concise book presents a summary of the results of excavations at the famous fortress of Ashdod Yam, on the southern coast of Israel between the modern cities of Ashkelon and Tel Aviv. This enigmatic building has been described and investigated by 19th-century travellers to the Holy Land, many of whom thought that it was a Crusader fortress despite the fact that it does not resemble any of the well-known Crusader castles. Located in sand-dunes next to the sea, it was partially covered in sand until the mid 1980s, when the sand shifted leaving the entire building exposed. Although some small-scale excavations took place in 1990, no detailed archaeological study of the building was carried out until the 1997–1999 investigations described here. Although the thesis of one of the excavation directors, Yumna Masarwa, incorporates material from these excavations, this book represents the only detailed publication. The excavations were carried out by the Israel Antiquities Authority and funded by Ashdod Tourism Agency with the aim of understanding the date of the fortress and providing a basis for consolidation and conservation.

The book is divided into three parts, starting with a historical introduction which sets the fortress in the context of early Islamic maritime history. Chapter 1 provides a rapid overview of coastal defences in the Byzantine, Umayyad and Abbasid periods (7th–10th centuries) while ch. 2 discusses coastal defences from the Fatimid to the end of the early Mamluk period (969–1291). There are some interesting general observations such as the fact that the desert frontier of the Romans and Byzantines (Limes Arabicus) was replaced by a maritime Mediterranean frontier under the Umayyads and their Muslim successors. It is also pointed out that the population of the coastal region of Palestine was predominantly Christian in the early Islamic period and therefore was a potential weak point in the conflict with the Byzantines. The introduction also sets the fortress within the wider context of Islamic coastal fortifications investigated in Israel, including the very similar fortress of Ha Bonim (Ar. Kefar Lam) near Haifa, and the two small towers at Mikhmoret and Tall Mikhal.

The second part comprises two short chapters dealing with the stratigraphy and the architecture of the fortress. The stratigraphic chapter does not provide detailed information about the stratigraphy of the excavations, but is more concerned with an architectural description of the fortress and the underlying remains of the earlier urban settlement. Three main phases are identified: ‘the Byzantine town below the fortress and the fortress itself that was built by the Umayyads during the late 7th–early 8th century’ (p.17), and was later modified, ‘probably during the Fatimid period’. The only remarks about the stratigraphy present a confusing situation with Byzantine material from the phase prior to the construction of the fortress mixed with Umayyad and Late Roman pottery. This was sealed with a thick layer of shells and sand which ‘suggests that this urban neighbourhood may have been partially abandoned before the fortress was built’ (p.18).

The third section present reports on the finds, with chapters devoted to ceramics (ch. 5), coins, metal, bone, wood and stone (ch. 6) and glass (ch. 7). Each chapter contains a discussion of the finds together with a presentation of the diagnostic material in tabular form, illustrated with drawings and photographs, some of which are in colour.

While the presentation of the results of this excavation is welcome, the book raises a number of issues concerning the dating of the fortress and its relationship to the earlier urban settlement. Firstly, the book does not set the fortress within its immediate context. While the author does give a brief review of previous excavations in the vicinity there is no plan that places the fort within the context of the remains of the Byzantine town of Azotus Paralius. There are, for example the standing remains of a bathhouse 100 m to its east (A. D. Petersen, 2001, A Gazetteer of Building in Muslim Palestine: 160. Oxford: OUP). There is also no attempt to discuss the coastal geomorphology or other environmental aspects of the site which might explain both the location of the fort and why the site was eventually abandoned.

The more pressing question concerns the date of the fortress, which is frequently referred to in the text as an Umayyad construction. It is apparent that the material excavated beneath the fortress was mixed, containing Byzantine pottery as well as finds from the Late Roman, Umayyad and later periods. The dating of the fortress is therefore mostly based on an analysis of the extant structure and comparison with other buildings. A
summary of the grounds for dating it to the Umayyad period are provided at the end of ch. 3, citing the uniformity of construction, the consistency in the style of masonry and the use of a single mortar type. While all these factors indicate that the fortress was built at a single date, they do not prove that it was built during the Umayyad period. The situation is further complicated by the fact that the mosque, which is located in the centre of the fortress, pre-dates the chambers lining the fortress walls, suggesting that it may also pre-date the construction of the fortress. Taken together with the Umayyad pottery in levels beneath the courtyard this suggests that the construction of the fortress could be dated considerably later than the Umayyad period. One solution to the problem could be the use of C14 dating of carbonized material from the walls. This method has successfully been used by Denys Pringle (Palestine Exploration Quarterly 145.2: 160–161) to date the more complex walls at nearby Ascalon, which have been shown to date from the Byzantine (5th–6th century), early Islamic and Fatimid periods.

ANDREW PETERSEN
University of Wales Trinity St David

Maritime Societies of the Viking and Medieval World
Society for Medieval Archaeology Monograph 37
JAMES H. BARRETT and SARAH JANE GIBBON (eds) with 29 Contributors

Large collections of papers from many contributors are often eclectic and of variable quality, but this substantial offering bucks the trend. It emerged from a conference of the same name held in Kirkwall, Orkney, in 2008, which brought together scholars from across the Nordic world to consider the communities and cultures of the area and their complex inter-relationships, articulated through maritime networks. The process of bringing the publication together identified gaps, and these have been filled with invited papers which complete the picture. The 24 papers are so many, varied, original and wide-ranging that to discuss them all in detail would exceed the bounds of a review, yet to treat a selected few would diminish the inter-connected character of the whole. Faced with this dilemma a reviewer can only present a descriptive summary of the content, prefaced by some general remarks and concluded with an assessment of the work as a whole.

Overall the book seeks to explain the causes and effects of the extraordinary explosion of maritime movement which shaped the settlement patterns and cultural evolution of much of Europe during the Viking and Early Medieval periods. Pressure from the east forcing expansion westwards from Scandinavia’s maritime periphery has long been recognized as a key driver, but the importance of the Baltic’s eastern seaboard and the river systems running into it as a springboard for penetration into Eurasia has emerged from the shadows following the opening up of former communist-block countries. Fresh and politically unbiased scholarship from these areas is one of the book’s major strengths.

Chapter 1, by James Barrett, sets the scene by summarizing how maritime societies in north-west Europe functioned, and how they were transformed by external and internal forces. This leads to a perceptive chapter by Christer Westerdhal on sails and the cognitive roles of Viking Age ships. Ingrid Gustin explores the complexities of trade and trust in the Baltic, and emphasizes the importance of weight standards. Marika Mägi looks at trade-centres in the eastern Baltic, while Dan Carlsson considers the interface between east and west in a study of economy and society on the Island of Gotland. Magdalena Naum considers similar issues from the perspective of Bornholm. Stefan Brink’s paper asks—and to some extent answers—whether maritime focal sites in early Sweden were trading hubs or centres of political power. A case study on the same theme is provided by Martin Rundkvist in his investigation of the Vikbolandet Peninsula, while Annemarieke Willemsen looks at the river-town of Dorestad in the Netherlands in the context of a fluvial society.

The consequences of managing a coastal environment’s water resources, and their impact on local communities, are considered by Dries Tyrs. Pieterjan Deckers applies a cultural-landscape approach to the recognition of small landing-places and the emergence of coastal urbanism in early medieval Northumbria. Dagfinn Skyre adopts theoretical methodology in his Post-Substantive approach to craft production and trade in Viking-Age Scandinavia, drawing on relationships between money, towns, markets and economic agencies. These worldly practicalities are counterpoised by Sæbjørg Nordeide’s study of Late Iron Age boat-rituals and ritual boats in Norway. Gitte Hansen returns to the urban theme with a study of Bergen and its development between 1020/1030 and 1170.

The first 14 chapters are largely confined to Scandinavia and the Baltic, while the final ten concentrate on the British Isles. Søren Michael Sindbæk looks at the distribution of steatite vessels as markers of migrants and travellers of the Viking diaspora in early medieval Britain and Ireland. Distributions of other archaeological markers which indicate status and identity in Norse settlements are considered by David Griffiths, who draws on evidence from Skaill in Orkney to show contacts with the
southern North Sea and the Irish Sea. Excavations by Niall Sharples and his colleagues at Bornais, South Uist, in the Outer Hebrides, where three Norse houses have been identified, lead to a debate (still unresolved) as to whether the Scandinavian presence here indicates integration with, or genocide of, the indigenous population.

Cultural diversity across the region is suggested by Steven Ashby in his study of the distinctive bone and antler combs in the North and Irish Sea areas during the Long Viking Age (c.900–1400). This detailed typological study suggests patterns of regionality, although the author cautions that confirmation of this hypothesis requires further investigation of other artefact types. Ashby’s paper is complemented by Jaqui Mulville’s study of cervids and their exploitation/management on the Scottish isles. The relatively small deer population in Orkney was killed off quite quickly by the Norse incomers, though red deer remained relatively prolific in the Hebrides throughout the period. The investigation of bone assemblages and other evidence suggests that wild deer were killed mainly for their skin, fur, and antlers, and not as a significant source of food. Antler was an important material for a range of products, including combs.

The weapon-burial rite in Viking Age Britain and Ireland is considered by Stephen Harrison. Finds are plotted with symbols indicating one to five weapons, and they are spread evenly though quite thinly throughout the Norse-occupied areas. The meaning of these apparently overt symbols of violence, it is argued, is not necessarily simple. They certainly express power and prestige, but not necessarily in a threatening way. More probably, Harrison suggests, they relate to the transfer of property or power from one generation to the next, and were a mechanism which underpinned social stability. Judith Jesch’s chapter, ‘The Threatening Wave’, is unique in this collection by exploring literary rather than archaeological material, yet is entirely in keeping with the book’s integrated approach. It considers Norse poetry and the Scottish Isles (mainly from Orkneyinga Saga) and provides fascinating insights to the contemporary world as seen from a Viking’s perspective. Even in translation it is splendid stuff.

R. Andrew McDonald has established himself as one of the leading scholars of the Norse diaspora, and his chapter, ‘Sea Kings, Maritime Kingdoms and the Tides of Change’, is a comprehensive exposition of the western seaboards of northern Britain and Ireland stretching from the Isle of Man to the Northern Isles from c.1100 to 1265. David Caldwell does a similar job for sea-power in the Western Isles from the early 14th to the end of the 15th century, during which most of the area was the fiefdom of the quasi-independent Macdonald Lordship of the Isles. Finally, Clare Downham considers coastal communities and diaspora identities in Viking Age Ireland, tracing the metamorphosis of presumed raiding-bases such as Dublin, Waterford and Limerick into major foci of settlement and trade.

This book will stimulate much thought and discussion among scholars of the Viking Age, and while interested non-specialists may find the need of a more comprehensive overview before navigating the variety and complexity of the topics explored, this can be remedied by first consulting a suitable general introduction. James Graham-Campbell’s The Viking World (4th edition, London, 2013) would provide an excellent starting point.

COLIN MARTIN

University of St Andrews, Scotland, UK

Early Ships and Seafaring: water transport beyond Europe

SEÁN McGRAIL


An excellent companion volume to the 2014 Early Ships and Seafaring: European Water Transport (reviewed in IJNA 45.2), which itself was a welcome revision of Ancient Boats in NW Europe (Longman, 1987, reviewed in IJNA 18.4). The author makes the point that ‘ships’ is only part of the series title, and that the real subject of this work is more accurately described as rafts, boats, logs, bundles, hides and other sundry floaty things; though it does include ‘ships’ when Chinese seagoing vessels are described. In line with the previous work the terminus of the study is AD 1500. Acquiring these two complementary Early Ships and Seafaring volumes would provide the reader with a concise account of the global evolution of mankind’s relationship with water-transport and an understanding of the development of traditional boat-types.

This volume embraces, on a global scale, the subject of early and indigenous maritime craft outwith Europe. Eight chapters divide the early maritime world rather brusquely between the territories of Egypt (though notably omitting the rest of Africa), Arabia, India, Australia, Southeast Asia, China, Oceania and the Americas. Each section explains the characteristics of the area’s maritime context and describes the evolution of boatbuilding traditions, the types of watercraft indigenous to the region and their construction, use and means of propulsion.

Of particular interest is the inclusion in each chapter of an account of navigation, both coastal pilotage and offshore. The ability to know where your vessel is located is still a crucial maritime skill, but competence in finding your way at sea is something different. The
generally accepted convention is that navigation at sea has advanced in parallel with the science of astronomy and timekeeping. However, simply by using an accurate and extensive knowledge of environment, topography and the heavens (and possibly the occasional use of a length of knotted string and a piece of wood with a hole in it) early mariners from diverse origins competently carried out their coastal and oceanic voyages centuries before any European navigational charts, tables and instruments made an appearance.

Each chapter is supported by a rich spectrum of illustrative sources from tomb models, carvings and scratchings on rocks through documentary iconography, early ethnography, 20th-century photography and comparison with present-day traditional wooden boatbuilders’ methods. This gives an informative perspective on construction of the earlier craft studied in the text and helps present a better interpretation of the maritime traditions and boats being described. McGrail not only refers to surviving accounts and iconography of ancient craft but correlates first-hand archaeological evidence from scarce surviving examples in order to illustrate their form and function so the reader can understand how a particular craft was constructed and developed to its particular trade or environment.

Archaeological research has made a substantial contribution to understanding the depictions and descriptions of ancient craft, and several references are indeed made to the immutable information provided by such excavated boat remains. The study of not just their construction but the timber used in their building can show just how global the early maritime world was. For instance the investigation of a wreck in Indonesia undeniably showed that Omani vessels plied these waters at least as early as the 9th century. The archaeological record also demonstrates the early diaspora of boatbuilding technology with an example of 2nd-century-BC Malay boats using Mediterranean-type mortise-and-tenon construction methods, also giving an insight to the scope of early maritime commerce across the globe.

We are also made aware of the gaps in our knowledge of past craft and cultures. Whereas Egypt can provide a wealth of surviving accounts, illustrations and models, as well as exceptional survivals such as the Cheops boat from 2600 BC, the Americas and Australia cannot provide the same abundance of material from excavations and documentation. What we currently know of their ancient craft is largely based on European accounts from not much earlier than the 16th century.

Not simply limited to the topic of boats and their building traditions the text concerns itself with harbours, canals, sea-level change and any other topic which had a direct influence on the use and evolution of the craft discussed. As an example, the chapter on Australia deals with a variety of craft such as bark-boats, river rafts and seagoing rafts, discussing the limitations of a boatbuilding tradition constrained by tools, raw materials and environment. We learn that while Australian log-rafts were noted, references to logboats only occur after first-contact accounts, and unfortunately prior to these European records the history of aboriginal maritime capabilities has to be left to educated speculation. It is conjectured that a prehistoric rise in sea-level stagnated, or even regressed, the development of seagoing craft to such a degree that, particularly in Tasmania, palaeolithic techniques still endured, unchanged, when the first Europeans arrived.

The arrival of Europeans, with their early ethnographic records of native peoples and cultures, is a recurring theme through the book, as with several of the subjects studied there is insufficient archaeological record or historical information to compile an account of maritime activity prior to that watershed. The paucity of excavations of ancient boats, when compared to Europe, primarily accounts for this, but some outstanding and unexpected examples of survival are described; for instance logboats from Sarawak used as coffins and dated to the 1st millennium BC. There is also discussion on the impact that 16th-century European ships and their building techniques had on indigenous boatbuilding, such as that in Arabia, citing it as a particular influence on cultures that previously were known to be using ‘plank-first’ and sewn construction in native boatbuilding.

In conclusion the author describes how travel by water is inextricably linked with the early expansion of our species across the globe, and with a synopsis of building traditions, range of boat types and early sea passages suggests an even earlier existence of ancient maritime transport than we have archaeological evidence for. A précis of the known excavated rafts, bundle-boats, logboats and planked boats (dating earlier than AD 1500 and amounting to only a few score, with the majority of those survivors being logboats) includes no known remains of any watercraft earlier than 7000 BC. Yet it is widely accepted that *homo sapiens* must have used water transport to spread across the continents and islands of our planet possibly more than 30,000 years before this.

The text ends with a critique of recent experimental boat archaeology and how it has added relatively little to our knowledge because only a few examples have been founded on first-hand evidence and scientific discussion. McGrail’s final comment makes the case for further ethnographic research in undeveloped parts of the world and for more proactive, targeted archaeological fieldwork to understand further the way our earliest boatbuilders developed their skills and used their vessels.

A dozen pages of glossary are provided to enable readers who don’t know their washstrake from their weather helm to understand the nautical terminology which is necessarily used throughout the volume. This is followed by a somewhat diminutive and idiosyncratic index of only four pages, which, it was
felt, did not contain adequate references to allow a discerning reader to readily access, or refer back to, the plethora of subject matter or specific points of interest contained within the text. For instance the section ‘T’ contains just one entry—‘trireme’. However, to counter that, the author has very considerately arranged the bibliography usefully by the relevant geographical regions.

Overall this volume provides an easily accessible and widely informative insight to readers with an interest in the types, construction, use and navigation of early vessels using the best available evidence from archaeological, ethnographic, documentary and iconographic sources which are as accurate and comprehensive as possible, while providing the student with serious points for discussion and further research.

STEPHEN LISCOE
Anstruther, Fife, Scotland, UK

The Survival of Easter Island: dwindling resources and cultural resilience

JAN J. BOERSEMA, translated by Diane Webb


The book, first published as Beelden Van Paaseiland (Uitgeverij Atlas, Amsterdam, 2011) is divided into nine chapters, followed by a glossary, notes and index. The bibliography is divided into the various historical periods: general early accounts of Easter Island; expedition of Dutch Admiral Jacob Roggeveen in 1721–1722; expedition of Spanish Captain D. Felipe Gonzalez in 1770; expedition of English Captain James Cook in 1774; expedition of French Comte La Perouse in 1786; 19th-century accounts; and general reference.

Boersema’s book on Easter Island is a captivating and comprehensive account of one of the world’s most mysterious islands, best-known for its enigmatic stone statues (moai). Easter Islanders appear to have stripped their forests and caused irreparable damage to their environment as part of an unsustainable cultural practice, ‘an ecological and cultural catastrophe’, which brought about their society’s demise. Jan Boersema, Professor of Principles of Environmental Sciences at Leiden University, states that there is ‘little basis in historical fact’ to support this claim, and he uses this book to investigate and explain what happened and why.

The book’s journey, as set out in ch. 1, starts from a lecture by British historian Clive Ponting in 1992 that Boersema attended. It was about Ponting’s book A Green History of the World, examining world history from an ecological perspective, and considering ‘the way people treat the environment as the principal determinant of a culture’s longevity’. Easter Island was highlighted as the most striking example of cultural collapse, centred around the islanders’ obsession with the statue cult, and how they denuded their forests for transporting the moai, as well as other uses, leading to erosion, loss of food production, and the undermining of the social structure, spiralling down to complete collapse. Ponting stated that when Dutch Admiral Jacob Roggeveen visited the island in 1722 he found ‘a society in a primitive state with about 3000 people living in squalid reed huts or caves, engaged in almost perpetual warfare and resorting to cannibalism in a desperate attempt to supplement the meagre food supplies available on the island’. Boersema was intrigued, and he questioned whether there were parallels with our 21st-century society and culture, given our demands for a quality of life that seems at odds with sustainability. A number of scholars and researchers, particularly Jared Diamond (author of Collapse, 2006), developed and promoted the ‘collapse’ theory of the Easter Island society, which he claims happened quickly before the arrival of foreigners.

Easter Island, so named by the Dutch who sighted it on Easter Sunday 1722, is one of the most isolated islands in the world, located in the Pacific Ocean over 3500 km west of the Chilean coast at Latitude 27°10′S, Longitude 109°21′W. The Polynesians named the island Rapa Nui and Boersema explains that according to Easter Island legend it is called Henua, which was expanded to Te Pito te Henua, meaning ‘part of the earth’. To view the island on Google Earth and to think about how Polynesians could have found this 165 km² island in the world’s largest ocean c.AD 1100 is truly amazing. Located at the eastern end of Polynesian migration, Easter Island is a symbol of remarkable feats of ocean voyaging and navigation unparalleled anywhere else on Earth.

Boersema takes the reader on a voyage of discovery about Easter Island society, cultural practices and relationship with the environment, and the many foreign influences and impacts. He accessed a rare copy of Admiral Roggeveen’s journal and found, contrary to Ponting’s claims, Easter Islanders described ‘a healthy population, saw no weapons and even traded linen for chickens and bananas … the land was not sandy, but on the contrary, exceptionally fertile, producing bananas, potatoes, sugar-cane of considerable thickness, and many other fruits of the earth’. They appeared to be living in harmony with their environment, cultivating what was ‘necessary for subsistence’. Further research found that there did not appear to have been a steep decline between 1680 and 1750: if there was a collapse it did not come until the
19th century and for different reasons. He uses the book to explore not only the reasons for the decline of Easter Island's society, but their cultural resilience and the relationship between culture and nature which existed there.

The book has a further eight chapters: 'From the East to the West' (Polynesia voyaging and settlement; introduction of the sweet potato from South America; Dutch, Spanish, English and French visits); 'The Green Past' (trees, vegetation, animals and introduced species); 'Culture Appears, Nature Disappears' (seven phases of settlement, Polynesian habitation, their gardens, appearance and chiefs); 'Makemake, Moai and the Tangata Manu' (Polynesian religion, society and culture, moai, the statue cult, the birdman cult); 'Resilience and Sustainability' (collapse?, 20th-century environmental awareness, hard facts, Easter Island population, carrying capacity); 'Foreigners' (uninvited guests, different goals, effects, little of good, true collapse); 'Christianization, Sheep Breeding and Research' (immigrants, missionaries, sheep, Chile, anthropological research, Thor Heyerdahl and Kon-Tiki); 'The Earth and Easter Island: Doom and Destiny' (doubts about collapse theory, rats, alternative interpretation, disappearance of ancient civilizations, Easter Island today). It is the combination of the various issues and influences discussed in these chapters that contributes to and strengthens Boersema's logical and thoughtful interpretation of Easter Island's cultural and natural decline, as well as the islanders' cultural resilience.

Trees covered most of Easter Island at the time of the arrival of the Polynesians. From pollen and archaeological analysis, trees had just about disappeared by 1550 and by the time of the arrival of the Dutch in 1722 no trees were to be found. However, the soil was fertile and food production was good, islanders from the 14th century using a stone mulch to keep the soil hydrated. Examination of islanders' skeletal and tooth remains found their health before foreigners was good, 'better than that of the inhabitants of other Polynesian islands and of Europeans as well'. In the 18th century the population was estimated at between 1500 and 3000. Diamond estimated a maximum pre-contact population of 15,000 from archaeological evidence, while Boersema, using a number of scenarios of population growth, as well as foreign estimates in the 18th century and a census in 1863, estimated a maximum population of about 4300. An investigation by Boersema, together with nutrition and environmental specialists, on the capacity of Easter Island found it could have sustained the higher, 'implausible' population of 15,000 people, 'even after deforestation'. In 2011 the population was c.6000. In 1797, foreign rats were in plague proportions; one whaling-vessel crew reported the 'coast was crawling with rats'. Another species of rat had been introduced by the Polynesians and there is agreement among researchers about the role it played in the disappearance of the forests through not allowing the regeneration of new trees.

Transporting and erecting the stone statues (the moai) across the island used the indigenous variant of the coconut palm (the most widespread of the 22 species); 'Culture Appears, Nature Disappears' (seven phases of settlement, Polynesian habitation, their gardens, appearance and chiefs); 'Makemake, Moai and the Tangata Manu' (Polynesian religion, society and culture, moai, the statue cult, the birdman cult); 'Resilience and Sustainability' (collapse?, 20th-century environmental awareness, hard facts, Easter Island population, carrying capacity); 'Foreigners' (uninvited guests, different goals, effects, little of good, true collapse); 'Christianization, Sheep Breeding and Research' (immigrants, missionaries, sheep, Chile, anthropological research, Thor Heyerdahl and Kon-Tiki); 'The Earth and Easter Island: Doom and Destiny' (doubts about collapse theory, rats, alternative interpretation, disappearance of ancient civilizations, Easter Island today). It is the combination of the various issues and influences discussed in these chapters that contributes to and strengthens Boersema's logical and thoughtful interpretation of Easter Island's cultural and natural decline, as well as the islanders' cultural resilience.

Boersema reviews many foreign journals describing the significance of the moai and concluded, 'the moai cult was, in essence, a form of ancestor worship which focused on the male line and was the exclusive preserve of the male clan leaders'. Fires were lit and rituals performed around the moai, and Cook concluded that 'if they had been the site of religious activities, [this] was a thing of the past ... and they were now used as burial grounds for clans or families'. The moai cult, which is estimated to have begun in the 13th century, diminished from 1650–1750, during which time new moai were carved in the quarry but could not be transported due to the lack of trees.

The decline of the moai cult gave way to the birdman cult, and the island contains c.400 rock-carvings of a birdman, a ‘graceful spiritual bird’, and descriptions survive of several weeks of rituals associated with the ‘crowning of the island’s new spiritual and social leader’ until 1878. Boersema concludes this discussion by noting that: ‘The pre-European history of the island is more a story of continuity and change than of collapse and disappearance. The continuity is obvious, because the islanders managed to adapt to deforestation and the consequences it had for their social and religious traditions. The emergence of the birdman cult was in keeping with the change in ecological conditions’.

Foreign visitors to Easter Island brought diseases (syphilis, measles, influenza, diarrheal illnesses and smallpox) which killed thousands of people, as happened in many other places in the Pacific, and Boersema blames this for the true ‘collapse’. In Guam (Micronesia in the western Pacific), for instance, the indigenous population went from c.60,000 to being almost eliminated in 150 years, caused mainly by introduced diseases. A major impact on the decline of Easter Island society was the slave trade. South America’s growing economy and the need for cheap labour brought slave-traders to Easter Island in the 1860s. A total of 1407 islanders, more than 30% of the population, was seized and carried off to Peru in less than six months, many being from the ‘island’s elite group of spiritual and social leaders’, thus losing leaders necessary for maintaining Easter Island’s social structure and culture. Many islanders returned,
This review touches on just a few of the issues investigated by Boersema, which support a gradual decline of Easter Island society, as opposed to a steep collapse caused by over-population and deforestation. I can thoroughly recommend this book; it provides an excellent and thoughtful analysis of Easter Island society, its environment and cultural resilience, in a very readable style.

BILL JEFFERY
University of Guam, Micronesia


VALÉRIE GRANDJEAN (ed.)

144pp., maps and colour photos, DRASSM, 2014;
173pp., maps and colour photos, DRASSM, 2015, both available to download at http://www.culturecommunication.gouv.fr/Politiques-ministerielles/Archeologie/Archeologie-sous-les-eaux/Documentation-scientifique, ISSN 1249-3163

The annual conference organized in Marseille by the Département des Recherches Archéologiques Subaquatiques et Sous Marines (DRASSM) took place in April 2016 in the well-appointed Museum of European and Mediterranean Civilisations (MuCEM) auditorium—which will also be the venue for ISBSA 2018. The mood was festive and little wonder: DRASSM, the Ministry of Culture department for underwater archaeology, was celebrating 50 years’ existence. Presentations were made by recent graduates of the two-year MoMarch Master’s degree (a collaboration between the DRASSM, the Centre Camille Jullian, and Aix-Marseille University that is now in its fourth intake) alongside professional and amateur archaeologists. They reported on work carried out around the French coasts and waterways, including the dominions and territories, with DRASSM support. International exchanges were also highlighted. Chai Xiaoming from China spoke about the Song Dynasty (960–1279) Nanhai 1 wreck project. Oussama Khatib, Stanford’s creator of the Ocean One ROV, presented the humanoid robot designed to cope with the exigencies of excavating La Lune, the wreck of Louis XIV’s 17th-century flagship which lies 100m deep off Toulon. A visit to the Mémoire a la Mer exhibition at the History of Marseille Museum, also celebrating DRASSM’s half century—and where some of those attending found their own histories of maritime research on display—and aperitifs served on DRASSM’s dedicated 36 m research-vessel, the André Malraux, tied up in Marseille Vieux Port, rounded off the day.

The annual Bilan Scientifique is another of DRASSM’s accomplishments. Every permit-holder for an underwater archaeological project—whether conducted by Inrap, the Ministry of Culture’s in-house excavation unit with its own underwater section, by one of the several independent archaeological operators, or by local groups of avocational archaeologists or archaeologically minded divers—is required to submit a short report for this publication. The content therefore varies in quality, content and length, ranging from a short paragraph to several well-illustrated pages. Together, however, they provide an annual snapshot of progress made. Reports are organized by coastal region (Atlantic, Mediterranean, Corsica, and Dominions and Overseas Territories) with a final section for inland waters and rivers, each accompanied by a location map and summary table. The large number of opaque codes and acronyms are (mostly) helpfully spelled out in the additional material at the back of each volume, which also includes a round-up of recent publications.

Some 92 projects were authorized in 2010 and 116 in 2011, most of which are outlined in these volumes. Reports can be classified in three groups: the first concerns surveys aimed at maintaining and enriching the ‘Carte Archéologique’, the inventory and concomitant map of the maritime sites. This is the baseline data necessary for managing the archaeological resource and organizing thematic research. As Michel l’Hour, director of DRASSM, writes in his introduction (2010: 9), sites have only been systematically mapped since 2006, so there is still much to do. In many parts of the country, particularly on the Atlantic coast, a great deal of the necessary monitoring and survey work is carried out by a small army of local volunteers and dive groups.

The second group is progress reports of multi-disciplinary and long-term research projects. Three national research programmes concern maritime activities directly (27: communication networks; 28: ports and maritime commerce; and 29: ship archaeology). In 2010 and 2011 particularly, surveys of the archaeological remains related to both World Wars on the Channel coast in advance of the recent commemorations were under way, including wrecks from Operation Jubilee (2010: 16), the train-ferry HMS Daffodil which struck a mine in 1945 (2011: 17) and the Mulberry harbour off Arromanches-les-Bains (2011: 19).

and preliminary results. Although the four-year delay in bringing these volumes to publication cannot be criticized in view of the large number of authors and projects involved, some of the entries have been superseded, with at least three of these wreck-sites having already been published (and reviewed in the _IJNA_) more fully in the meantime.

The inland waterways sections, although sparser and showing marked inequality in numbers of projects between different river systems, covers a huge range of sites from Bronze Age ritual deposits to medieval fish-traps. Eleven of the 111 Unesco World Heritage Neolithic and Bronze Age lake villages are in France, and work in Lac Bourget, Savoie, is reported in both editions (2010: 130–132; 2011: 161–163).

It would be possible, using the complete series, to research previous work in a specific location or site, but I suspect most readers dip into the _bilans_ for a look back at the year. Each edition contains surprises—my attention was caught by the wreck of a floating mill at Saunières on the Doubs (2011: 137). I have only recently encountered this vessel-type, but it was fairly widespread in Europe from the late Roman period onwards, although few now survive. The mill equipment, mounted on a barge, could be floated out to the middle of the river to benefit from the faster flow.

I don’t recommend reading the _bilans_ from cover to cover—I was frustrated by one cliff-hanger after another: What happened next? What were the results? I am curious, for instance, to know whether installations of amphoras from the Grand Congoulé site, originally salvaged by the Cousteau team, to create diver attractions have survived (2010: 53). Two sites, Pomêgues (91 amphoras) and Niolon (195 amphoras) off Marseille have been set up with the help, and under the surveillance, of two local dive clubs to give the impression of a two wreck-sites. It is an original way to deal with the storage of bulky artefacts and, as the authors remark, only time will tell whether other divers are wise enough to leave the sites intact. However, the idea that all projects, no matter how minor, have at least one publication four years later is to be applauded and could usefully be replicated elsewhere.

In case all this gives the impression that the French underwater-archaeology community is sitting back in smug satisfaction, rest assured that Michel L’Hour and Yves Billaud’s introductions to both volumes tend to skim over each year’s success stories, preferring to campaign for more manpower and finance to protect the underwater archaeological resource effectively. Some project directors also tell of reductions in the underwater archaeological resource effectively. Some project directors also tell of reductions in

REVIEWS

_Pieces of Eight: more archaeology of piracy_

CHARLES R. EWEN and RUSSELL K. SKOWRONEK (eds)


Writing about crime from its own perspective is a difficult topic for historians. Criminals do not usually keep and archive records of their misdeeds, and those who get caught and convicted are, by definition, failures. Official records emphasize the successful processes of pursuit, trial, and retribution by societies through the activities of their law-enforcement agencies. Successful malefactors remain under the historian’s radar, and seldom write their memoirs, so historians of crime tend to emphasize the losers. This imbalance is exacerbated by a public appetite to see convicted felons get their just deserts.

Nor (to carry the analogy further) could future archaeologists deduce much from looking at the artefacts involved in criminal acts. A gun or a getaway car is unlikely, of itself, to yield evidence of how it was used in villainous activity. Similarly a shipwreck whose crew had been pirates would not necessarily reveal by an analysis of its material assemblage the predatory behaviour in which they had been engaged. The old joke (repeated in various guises by several authors in this book) that archaeologists seeking to make such a connection should look for hooks, parrot bones, and wooden legs underlines the problem. Pirate ships, it might be argued, are unlikely to show clear archaeological signatures. But is this generalization too pessimistic? The 15 authors and editors of _Pieces of Eight_ certainly think it is.

The core of the volume summarizes the investigation of several shipwrecks believed to have been associated with piracy. Perhaps inevitably most have attracted treasure-hunters and publicity-seekers, though sometimes the damage has been mitigated by later archaeological input of varying duration and quality. Even so, the resulting databases are not nearly as comprehensive or reliable as they should have been.

Several wrecks are assumed to have piratical associations. What may be the remains of Black Bart’s _Ranger_, lost during a hurricane at Port Royal in 1722, were found and insensitively salvaged by Robert Marx in 1967. The surviving timbers were re-examined in 2012 by a team from the Institute of Nautical Archaeology at College Station, Texas, led by Chad Gulseth, who recovered the limited data that could be retrieved from a badly disturbed site and reports on his work here. A wreck identified as William Kidd’s _Quedagh Merchant_ is currently being investigated in the Dominican Republic by Fredrick Hanselmann and Charles Beeker whose approaches, despite their academic credentials, are in some respects more thorough and comprehensive than those applied to the _Ranger_.

MIRANDA RICHARDSON

_castelnaudeMontmiral,France_
questionable. It is reasonable to show, in Fig. 5.1, Howard Pyle's spirited but entirely imaginary 1921 rendering of Kidd as an indicator of contemporary perceptions of the pirate genre. It is not, however, acceptable to present a modern and equally imaginary 'contemporary portrait' (Fig. 5.2) of Kidd spuriously credited to Sir James Thornhill (1675–1734). Thornhill indeed painted Kidd shortly before his execution in 1701, but this is not the picture reproduced, which is the work of an uncredited modern artist commissioned by the Children's Museum of Indianapolis as part of an imaginative pirate display. The two paintings are not remotely similar in either content or style. One might also question the logic of producing two site-plans of the supposed Quedagh Merchant on consecutive pages, one of which is an identical segment of the other at an only slightly increased scale. The chapter as a whole, though not without interest or relevance, is not a work of deep scholarship.

A better verdict may be passed on a chapter about the supposed Fiery Dragon, lost off Madagascar in 1721. In 2000 the treasure-hunter Barry Clifford mounted a search for it and discovered several wrecks in the vicinity, though the one he focused on produced late artefacts and the project was abandoned. Ten years later John de Bry, a former colleague of Clifford's who subsequently shook off his treasure-hunting mores, researched the documentary sources with a Dutch colleague, Marco Roling. He returned to the area and found what appears to be the right wreck. Preliminary sampling has yielded a diagnostically significant group of artefacts.

An exception to this rather depressing catalogue of missed opportunities is the Beaufort Inlet wreck, convincingly though still not unequivocally identified as Blackbeard's Queen Anne's Revenge in spite of a legal ruling to the contrary. However North Carolina's cultural resources department has managed the investigation since 1998 with impressive results, and these are admirably summarized by Mark Wilde-Ramsing and Linda Carnes-McNaughton. Their chapter is an interim statement of work in progress, but the indications are that it will contribute significantly to a soundly based 'Archaeology of Piracy' which this book so strongly advocates. But in achieving this the depredations of an uncritical earlier era should not be ignored, and we cannot reject discoveries made in less auspicious circumstances. Despite the controversy they have generated we must take note of Barry Clifford and the Whydah, which after all remains the only pirate wreck certainly identified, whether by treasure-hunters or academics. The name is on the ship's bell.

Perhaps the strongest chapter is by Connie Kelleher, who from a range of sources looks at early 17th-century piracy on the south and west coasts of Ireland. Her view is essentially shore-based, and from a careful review of documentary sources she goes on to identify hidden harbours and secret pathways by which pirates and smugglers exploited local knowledge to pounce on victims or flee from retribution. The theme of land-based evidence is developed by Kathleen Deagan, who demonstrates how a comparison between artefact assemblages and the domestic contexts in which they are found can point to illicit activities such as piracy or smuggling. Drawing mainly on documentary material and excavated sites in Florida, she adjoins evidence to show that the inhabitants of low-status sites where high-status items predominate were probably doing something they should not. Much the same applies to shipwreck assemblages, and in a concluding chapter Courtney Page and Charles Ewen analyse statistically the proportions of certain 'indicator' groups of artefacts. This is based on comparative assemblages from four excavated shipwrecks which include two pirate vessels (Queen Anne's Revenge and Whydah), a warship (Invincible), and a merchant ship (Henrietta Marie). Though the sample is very small the results do seem to be indicative, and at the very least point to ways forward.

In some ways this is a disappointing book, because one is constantly left with the feeling that things could have been approached differently, and better. But that is to indulge in hindsight. On reading these papers one is left in no doubt that the archaeology of piracy (or perhaps predation is a better word) is a viable proposition, although it needs a lot more good fieldwork combined with comprehensive data-gathering and -analysis before it can move forward constructively. Anyone inspired to become involved in this process should certainly read this book together with its predecessor, another multi-authored collection of papers on the topic (of similarly variable quality) published by UPF with the same two editors (X Marks the Spot: The Archaeology of Piracy, 2006, reviewed in IJNA 37.2: 418).

COLIN MARTIN  
University of St Andrews, Scotland, UK

Jutland: the archaeology of a naval battlefield

INNES MCCARTNEY


The centenary of the largest naval battle of all time is an ideal occasion for archaeology to provide a fresh and important perspective on a controversial subject. Twenty-five warships were sunk during the day-and-night engagement on 31 May–1 June 1916, from a total of 250 British and German units. In several cases the cause of loss, and even the location of the ships, remained unclear. This large-format book, the first to locate, chart and examine all the wrecks on the battlefield, is a testament to the rapid advance of underwater survey technology, and the laudable
commitment of Gert Normann Andersen, founder of JD-Contracor A/S, the leading Danish underwater contractor, and the expert on the site. Gert made the book possible, dedicating his research vessel to a project which he has long wished to see completed.

The scale of the battlefield emphasizes the value of modern sensors. It is impossible to see large wrecks, like the big armoured ships at Jutland, in their entirety, but sidescan and the latest multi-beam sonar has revolutionized the ability of archaeologists to locate and analyse wrecks on the seafloor, while ROVs reduce the risk and improve the endurance of divers. McCartney uses his own 17-year connection with the battlefield to reflect on the impact these changes have had on his ability to understand the ships and their setting.

The battlefield was first studied in 1920, when Captain John Harper RN located the wreck of HMS Invincible in order to reconcile the navigational records of the Grand Fleet and the Battlecruiser fleet, which had been operating separately until shortly before the ship sank. McCartney worked from Harper's charts, provided by a grandson of Lord Jellicoe, the British Commander in Chief. These proved to be remarkably accurate, given that both fleets had steamed for many hours without astral fixes, recording their positions by dead reckoning. Other large ships have been found and plundered by illicit salvage operators, researchers and navies. In 2015 Andersen hired McCartney, who had been diving on the site for more than decade, as his deputy to conduct the first full survey to locate and record the wrecks.

After a brief overview of the battle McCartney examines each of the major wrecks in sequence, bunching the destroyers into two groups. The very first, HMS Indefatigable, demonstrates the value of the exercise. McCartney's analysis of the wreck explains the catastrophic explosion which destroyed the ship, reconciling eye-witness testimony, images and archival records. The ship was broken in two by the explosion of cordite propellant in an after heavy-gun magazine, an explosion which generated a massive pressure-wave which killed everyone inside the hull. The only two survivors had been stationed in the forward spotting-top. The ship then sank in two separate stages; as the bow rolled over, the forward magazine also exploded. The multi-beam survey revealed that wreckage was spread across hundreds of square metres. In the next loss, HMS Queen Mary, the stern section carried on steaming ahead after the bow sank, creating problems with timings which this book has reconciled.

By combining sonar and visual images, ship's plans and even an inspection of a contemporary armoured cruiser, it has been possible to piece together the cause of loss in most cases. On the British side five big armoured ships were destroyed by catastrophic magazine explosions, in three cases due to poor safety procedures, in two cases due to outdated design. These ships accounted for almost all the British casualties.

A German battleship SMS Pommeren also exploded, killing the entire crew. The wreckage is the most widely dispersed of all the ships.

This crisply written book, clearly aimed at a broad audience, offers a unique case study of how 21st-century techniques can make sense of a very large sea-battle, and examine the individual wrecks. This is a significant contribution to our understanding of the battle, the detailed causation of individual ship losses, and the problems of recording large-scale maritime events. Sonar images and underwater photographs show that the ships are deteriorating fast; the lightly built destroyers have become increasingly spectral, especially after being ripped apart by scrap-merchants. Propellers have been cut off; one from Indefatigable turned up recently in a Dutch scrapyard. Both ships and battlefield are completely unprotected.

Since going to press McCartney and the Danish research team have located and filmed the wreck of HMS Warrior, which foundered the following day, lying upside-down some 20 miles from the position John Harper had estimated back in 1920 (http://www.dailymail.co.uk/news/article-3796350/The-final-missing-ship-Battle-Jutland-sea-bed-100-years-devastating-WWI-clash-killed-9-000-sailors-36-hours.html). It should be possible to determine the cause of her loss. The project is complete.

This beautifully produced book has made a major contribution to our understanding of the battle, adding archaeological rigour to events usually discussed in terms of chance, human error and uncertainty. Old myths have been dispatched, fake photographs exposed, and the fog of war lifted. Finally this is a critically timely project; by the time the next centenary comes round most of the evidence will have gone, a victim of decay or plunder. In an attempt to reduce the threat to the wrecks their precise locations have not been given in the book, a sad but necessary comment on human nature, and the incapacity of four governments (those of the combatants, and the two countries within whose EEZs the site falls) to do anything to secure them.

ANDREW LAMBERT
War Studies, Kings College London

The Social and Economic Benefits of Marine and Maritime Cultural Heritage: towards greater accessibility and effective management

ANTONY FIRTH

The United Kingdom, like most countries in the world, has a very diverse and important marine and maritime
cultural heritage, offshore as well as on land, which generates understanding of the past and valuable public appreciation and support in the present. A perfect example to illustrate the importance of the UK’s marine and maritime cultural heritage (and of marine and maritime heritage in general) is the Sutton Hoo ship-burial site. The archaeological site demonstrates quite clearly the vital role of maritime connections in the Anglo Saxon period, and the artefacts from the site are now a centerpiece of the British Museum. Nevertheless, marine and maritime cultural heritage does not receive adequate attention and is even absent from debates and from policy (in the UK but in many other countries as well) largely due to lack of awareness, but also due to the related lack of studies on its social and economic benefits. Such studies are increasingly available for heritage on land, and for the marine environment, but are rare for marine and maritime heritage.

This publication is a very strong and thoroughly underpinned and well-illustrated plea to experts of marine and maritime heritage to direct much greater attention to document and study the social and economic benefits of marine and maritime cultural heritage. After a sharp analysis which sets the scene in the introduction, two basic questions are answered: Who can benefit? And how can benefits be identified? The illustrations on pp.16 and 29 are very helpful. From p.28 onwards a stimulating discussion follows on ten carefully selected topics: participants, visitors, inhabitants, ecosystem services, wellbeing, making it count, engaging in debate, joining up, stimulating research, enabling. The text ends with a conclusion that contains four practical steps to be taken. The report contains at the end a list of references and an appendix presenting UK and European policy relating to the social and economic benefits of cultural heritage and the maritime environment.

‘Marine and maritime heritage’ is deliberately and quite rightly chosen above ‘underwater cultural heritage/nautical archaeology’ or ‘continental-shelf prehistoric research’ to allow the joining-up of intimately interrelated heritage assets, and by achieving this to spread the consideration of the benefits beyond civil servants involved in designation of wrecks and divers enjoying diving on shipwrecks.

This is a publication that everyone concerned with the wellbeing of marine and maritime heritage should carefully read and try to put into practice. In relation to sustainable development more and more international agreement is growing that culture should be placed at the heart (as a driver and enabler) of Sustainable Development Policies as stated in the Hangzhou declaration (May 2013). That means that culture should, in fact, be considered as a fourth pillar of sustainability and not merely as a component of Environment, Economy or Society, as is mostly done now. This would make the case for the benefits of marine and maritime heritage even stronger.

Many people are indeed attracted to watery environments for leisure’s sake. Let us take advantage of the huge numbers passing their holidays at sea, on the coast or along rivers to spread information and by doing this to raise awareness and improve accessibility. This publication makes a thorough analysis of the general situation marine and maritime heritage is confronted with: a fantastic legacy but undervalued. The booklet not only analyses the situation but also explores remedies to redress this imbalance. I hope that many people concerned with this fantastic heritage get the opportunity to read this publication and find the means and inspiration to put (some of) the suggested solutions into practice and thus gather much-needed data and information.

MARNIX PIETERS
Flanders Heritage Agency, Brussels

HMS Hampshire: a century of myths and mysteries unravelled

JAMES IRVINE, BRIAN BUDGE, JUDE CALLISTER, KEVIN HEATH, ANDREW HOLLINRAKE, ISSY GRIEVE, KEITH JOHNSON, NEIL KERMODE, MICHAEL LOWREY, TOM MUIR, EMILY TURTON and BEN WADE


This short book is a compilation of essays by a number of Orcadian and international writers on topics surrounding the loss of HMS Hampshire to a mine off Orkney in 1916 and subsequent investigations of what happened. The opening chapters comprehensively detail the circumstances that led to the loss of the ship, and are particularly informative on issues relating to the German mining offensive and the nature of Kitchener’s mission to Russia. The book then turns its attention to the sinking of Hampshire itself, rescue efforts made and the stories of the few survivors who made it onto liferafts. The attempts to keep the disaster quiet through censorship, and even intimidation of the local populace, is also given full airing; a topic which usually does not receive attention. Further chapters provide biographical details of the few survivors and many of the casualties.

The final chapters cover the legacy of the loss of Hampshire up to the present day. This includes a chapter on the building and subsequent restoration of the Kitchener memorial (the proceeds from this book will go to the Kitchener Memorial Refurbishment Project). A chapter also covers the history of the wreck-site itself, through illegal salvage to recent geophysical and diving surveys, featuring some nice
photographs. The final chapter covers the extent of the 100th Anniversary commemorations. This is an interesting publication, covering many topics surrounding this most enigmatic of shipping losses, and it will appeal to a wide range of readers. There is even a chapter covering conspiracy theories. A worthy addition to any library covering Orcadian or broader naval history; recommended.

INNES McCARTNEY
Bournemouth University, UK

The Hoo Peninsula Landscape

SARAH NEWSOME, EDWARD CARPENTER and PETER KENDALL


This authoritative and well-presented book describes how changing land-use and coastal activity have given this area its distinctive character. The Hoo Peninsula, in Kent, lies on the south side of the Thames estuary, between Gravesend and Rochester, with the estuary of the River Medway forming its south-eastern edge. It is generally flat, though with a central spine of low clay hills. Much of its low-lying fringe is saltmarsh or reclaimed land. At its north-east tip is the Isle of Grain, no longer an island.

Military uses of the area include a 14th-century castle, 16th-century Upnor Castle, guarding the Medway and Chatham Dockyard, and coastal forts and other installations built in the 1860s and during the two World Wars to try to prevent access to London by sea or air. Industrial uses started with salt-making in Roman times or even earlier. The 19th century saw a boom in the manufacture of bricks (using clay dug from the saltmarsh) and of Portland cement, shipped up the Thames to London until railways replaced them.

The book itself is a very pleasant object to handle and to read, with quality paper, clear presentation and informative illustrations. The contents, organized on a neat plan, cover a wide spectrum of topics relating to the conservation of underwater artefacts. The only area not discussed is in situ conservation, or reburial. The ‘on-site conservation’ chapter is actually devoted entirely to field conservation, a very similar appellation but very different procedure. Considering the keen international interest in reburial, the example of the Korean shipwreck ‘Mado No.3’, maintained under water by NRIMCH, would have been an appropriate inclusion in the manual. Overall, it is definitely a manual worth reading for any Korean student of conservation and archaeology. As a side note, however, in my personal opinion a conservation manual should include more chemical-risk awareness and raise a certain sensibility towards the cautious use of chemicals in treatments, particularly when it comes to hydrochloric acid on ceramics.

One can only congratulate NRIMCH on the manual’s prompt translation into English, after an initial publication in Korean. The English version may sometimes be awkward to read, due to translation anomalies, but is always understandable. Some minor mistakes could have been avoided during the editing process; for example, the shortcut in animal material classification in the ‘bone and horn’ chapter, or the mention of BTA use for iron in tables, when NRIMCH does not use BTA for iron treatments.

Conservators would find this both global and specific insight into one particular laboratory interesting, with all its methods and procedures presented in the same volume—should I be ashamed to confess that it is the first time I have read a manual from its very first to very last line? Specialists, however, may regret that the tight presentation does not allow enough detail and discussion of method development and

treatment choices. That would also have been of benefit to students of conservation who need, more than anything, to learn about appropriateness and treatment adaptation to each individual artefact.

Being based on examples, the described protocols constitute a good illustration of Korean conservation, but some parallels with other methods would have given more strength to the demonstration of their relevance. Discussions, such as the use of T-butanol on PEG treatment or details about the treatment of bones would have improved the scientific quality of the book, but they probably do not belong in a manual that is conceived to be concise, especially when these topics have been published elsewhere. Furthermore, if the content of the book raises any questions, the authors are evidently keen to offer further details and discuss their topics when contacted (Whansuk Moon, Head of Department of Underwater Excavation and Conservation, NRIMCH, moon118@korea.kr).

MARIE-AMANDE COIGNARD
Oris-en-Rattier, France

Viking-Age War Fleets: shipbuilding, resource management and maritime warfare in 11th-century Denmark
Maritime Culture of the North 4
MORTEN RAVN
161pp, 70 figures, tables and photographs (many in colour), Viking Ship Museum, Roskilde, 2016, €60/£50 (hbk), ISBN 978-8785180728

Morten Ravn is a curator and research co-ordinator at Roskilde’s renowned Viking Ship Museum, and a driving force in the building and testing of reconstructions based on the excavation of shipwreck remains. This book is a revised version of his PhD thesis, and considers the phenomenon of Denmark’s large, well-organized, and successful 11th-century war-fleets in the round—the evolution and construction of specialized ships, the acquisition and management of the resources required to build and sustain them, and the strategies, tactics and logistics of deploying fleets in war. These integrated studies are underpinned by the museum’s formidable collections of shipwreck and other material, and data gathered in the course of its pioneering programme of reconstruction as a nautical archaeological tool. That the programme has at the same time created a major and continuing focus of public interest and engagement is a powerful bonus.

The geographical area of study is defined not by the modern borders of Denmark but by the perceived territories of 11th-century Danish kings, and by the locations of relevant shipwreck finds. Broadly the region encompasses Jutland, the Danish Baltic islands, the southern part of what is now Sweden, and southwards into modern Germany. The corresponding distribution of boat-finds includes Schleswig and Hedeby in south Jutland, Hasnæs to the north-east, Skuldelev and Roskilde on Sjælland, Fribsø and Falster, and Fotevik near the southern tip of Sweden. Ships relevant to naval operations in the Late Viking Age comprised two general types, both represented in the Skuldelev assemblage. The relatively broad-beamed cargo ship (up to five times as long as it is wide), which appears to originate around the beginning of the 10th century, had, in military terms, a mainly logistical function. The long narrow ship (more than five times as long as it is wide), with its capacity for a large crew (warriors who rowed) was primarily a troop-carrier. This distinction, and other more detailed criteria, are used statistically throughout the book to inform the author’s arguments, though he is at pains to stress that the criteria are modern constructs and do not necessarily accord with historical realities. They are, however, good starting points.

By far the most reliable data are derived from experimental archaeology generated by the practical reconstruction of ship remains. This work dates from the Museum’s establishment in 1969, following the major ship-finds at Skuldelev. Since all these were to a greater or lesser extent fragmentary their study, reassembly, and display required the development of appropriate reconstructive methodologies. This process has continued ever since, with a concomitant refinement of approaches and techniques. In consequence Roskilde has not only become the world’s leading centre for such work, but has built up a formidable archive of data, while at the same time fostering and training scholarly shipwrights with skills which probably match those of their Viking predecessors, in mindset as well as in handling traditional tools and materials.

This combination of archaeological theory, methodology, recording skills and practical craftsman- (and woman-) ship informs Morten’s seminal chapter on shipbuilding. He chronicles the evolution of nautical archaeology and associated experimental work from the early 1960s as a basis for describing the techniques and philosophy of Norse-period shipbuilding. Easy categorization is obscured by regional and individual idiosyncrasies, since it appears likely that vessels of the period were not ‘designed’ but formed using guidelines based on relative measurement systems and rules of thumb within a generally accepted traditional envelope. Each vessel was therefore a ‘one-off’ within its over-arching tradition.

The acquisition, transport and processing of timber is considered in detail. At this period logs were cleft tangentially, giving greater strength and stability than sawn planks. The now well-established building sequence is described with much practical illustration. There is little new here but the exposition is succinct
The importance of iron-working is stressed, and techniques of smelting and forging described, as is the production of metal components, notably rivets and roves. The manufacture of charcoal had a central role in these processes. Wooden ships require continuous maintenance throughout their lives, a point often forgotten, and Morten considers this with reference to the production of tar and paint.

Ships also require much ancillary equipment, and this in turn depends on good resource-management and procurement. Although finds of sail-material are rare, what evidence there is suggests that wool was the common fibre. Depending on the size of the sail (large sails require thicker fabric), between 100 and 400g per m$^2$ are required, and an average sheep (again, there are many variables) might produce annually 500g of wool suitable for sail-making. Experiments have shown that a 25m$^2$ sail would take about 2000 working hours to spin the yarn and sewing-thread with a spindle, and a further 1600 hours to weave the cloth on a warp-weighted loom. Once tested in use it was necessary to coat the sail with a mixture of grease, tar, and sometimes ochre to seal, preserve and decorate it. No evidence for linen sails has been adduced for the Viking Age, although written sources suggest that it was used in the High Middle Ages. Rigging fittings and cordage were also required. Until recently it was believed that Viking-Age rope was made mainly from oak and elm bast, but research now indicates that lime bast was the preferred material (experiments have shown that oak bast is extremely difficult to make into rope). Cordage was also made from animal skin and hair. Wool spun into coarse yarn or strands and coated with tar was used for caulking. Withies were also required for attaching rigging to the hull and securing the rudder to its frame.

The third section of the book considers how the need to build and equip ships suitable for state-directed warfare stimulated the identification, management, and exploitation of the required resources. All these elements coalesced to create systems of organization, administration and control which drove the processes of state formation. Much of these data are presented in tabulated form, derived from the building of experimental reconstructions, informed by an assessment of the natural and human resources required to bring ships and fleets into being, and to maintain and operate them. The figures—for too detailed to summarize here—are staggering. But to take what is admittedly the most extreme example, to create and maintain a 160-strong fleet comprising 120 large- and medium-sized personnel-carriers and 40 large- and medium-sized cargo ships is calculated to require the resources of 68,700 ha of woodland, 1519 ha of grazing, and an annual input of 660,000 hours of human effort.

War is a specialized form of human violence which is waged from many motives and in many ways. In Viking maritime contexts it was most readily characterized as raiding by small groups of vessels or single ships using the principles of mobility, concentration of force, and surprise. Such operations made few logistical demands on their perpetrators, for they could usually replenish provisions by forced requisition. Larger amphibious operations were much more complex, since an invasion fleet had to carry with it resources to supply itself during the voyage and the initial stages of the campaign. It also had to transport military equipment including, perhaps, horses. This in turn dictated the composition of a fleet, which in Viking terms would include personnel-carriers for the invasion force, which could progress quickly and steadily using oars and sails. Supporting stores and livestock, essential to sustain the main force after it had gained a foothold on shore, however, required a contingent of cargo ships, which were slower and less manoeuvrable, relying mainly on sails and the vagaries of wind. Such combined operations were therefore vulnerable to dislocation by the difficulties of maintaining communication and coordinating movement. Finally there was the option of a fleet battle, which involved a measure of co-operation by the opposing parties in forming opposing battle-lines which were often then tied together ship-to-ship. Something of the complexity of large-scale maritime operations in the Viking period has been revealed by excavations at Fribrødre A, which appears to have been a major building and maintenance base for a large fleet in the late 11th century.

This study reveals, by careful research and analysis based largely on reconstructive archaeology, the full implications of creating, maintaining, and operating war-fleets during the Viking era. It explains the symbiosis between natural resources, maritime technologies, warfare, and (by implication) early medieval state-formation processes. The argument is detailed, and might have been tedious had not skilful use been made of tabulated data to lighten and clarify the text. As a result it is a rewarding read with a thought-provoking message, with the tables readily to hand for those who wish to delve more deeply into the evidence. There are two appendices, a glossary, extensive footnotes, and a very full bibliography. The lack of an index is, to this reviewer, its only shortcoming.

COLIN MARTIN
University of St Andrews, Scotland