

Claire Smith
Editor

Encyclopedia of Global Archaeology

 SpringerReference

- OTTAWAY, P. 1992. *Archaeology in British towns. From the emperor Claudius to the black death*. London: Routledge.
- PLATT, C. 1979. *The atlas of medieval man*. New York: St. Martin's Press.
- 1996. *King death. The black death and its aftermath*. London: UCL Press.
- QUINN, D.B. 1974. *England and the discovery of America, 1481-1620*. New York: Knopf.
- SCHOFIELD, P. & A. VINCE. 2003. *Medieval towns*, 2nd edn. London: Continuum.
- VERHULST, A. 1999. *The rise of cities in North-West Europe*. Cambridge: Cambridge University Press.
- WALLACE, D. 2004. *Premodern places: Calais to Surinam, Chaucer to Aphra Behn*. Oxford: Wiley.
- WARD PERKINS, B. 1988. The towns of northern Italy: rebirth or renewal?, in R. Hodges & B. Hobley (ed.) *The rebirth of towns in the West, AD700-1050* (Report 68): 16-27. London: Council for British Archaeology Research.

Mediterranean Sea: Maritime Archaeology

Emad Khalil
Centre for Maritime Archaeology, Faculty of Arts, Alexandria University, Alexandria, Egypt

Introduction

The history and development of Maritime Archaeology as a scientific discipline is closely related to the Mediterranean Sea, which has been a witness to some of the oldest civilizations in the world. Along its shores flourishes the Ancient Egyptian, the Phoenician, the Greek, the Roman, the Byzantine, and the Islamic civilizations (Norwich 2007; Scarre & Fagan 2008). Accordingly, throughout the ages, maritime activities played a major role in the rise, development, and decline of such civilizations and societies. On the other hand, their maritime activities have left an array of material cultural evidence, which mainly takes the form of shipwrecks, harbors, and other waterfront installations.

Since the beginning of the twentieth century, the discovery of submerged archaeological

sites in the Mediterranean triggered studies in maritime and underwater archaeology in different regions and countries, subsequently, the field of maritime archaeology in the Mediterranean witnessed substantial development on different levels including research, education, preservation, and public presentation.

Definition

It is quite essential, at first, to define Maritime Archaeology, which is the subdiscipline of archaeology concerned with the study of maritime cultural heritage. It mainly includes the study of different types of watercrafts, as well as the study of coastal installations, whether these were found on land or underwater. Maritime Archaeology is not the same as underwater archaeology, which describes the study of the past through any submerged remains (Muckelroy 1978: 3-10). In other words, there are maritime archaeological sites which are not located underwater, such as ship burials, and there are submerged remains which are not of a maritime nature, such as jettisoned cargoes. However, it is evident that shipwrecks are the most common type of maritime archaeological sites; therefore, the development of maritime archaeology in the Mediterranean is often associated with the investigation and study of shipwrecks. On the other hand, maritime archaeology contributed significantly to the development of different studies such as ancient ship construction, ancient seafaring, and harbor archaeology. This entry will be looking at the development of maritime archaeological investigation which has been carried out along the shores and under the waters of the Mediterranean Sea.

Historical Background

Maritime Archaeology in the Mediterranean has gone through different phases of development which started as simple salvage operations and the recovery of submerged objects for their artistic, cultural, or monetary values. Sponge divers,

in particular, have often encountered many ancient shipwrecks, and in most cases mounds of amphora and pieces of wood were of little or no interest to the sponge seekers. However, in 1900, sponge divers discovered near the Greek island of Antikythera the remains of an early first-century BC shipwreck at a depth of 55 m. The ship was carrying bronze and marble works of art, in addition to several pottery and glass items. The discovery of the shipwreck caught the attention of the Greek authorities who decided to salvage the ship's cargo for its artistic and historical value. The project was directed by the Greek antiquities authorities; however, the underwater work was exclusively carried out by helmet sponge divers (Throckmorton 1991: 16-20).

Another significant step in the development of maritime archaeology in the Mediterranean was the excavation of the Lake Nemi vessels in Italy. Since the fifteenth century, there have been several attempts to salvage the two large Early Roman vessels, submerged in Lake Nemi south of Rome. However, between 1928 and 1931, on the orders of the Italian dictator Benito Mussolini, the lake was drained using powerful pumps to expose the two immense and lavishly decorated vessels from the time of the Roman emperor Caligula. Nonetheless, the motive behind the project was political and nationalistic rather than archaeological (Blot 1996: 38-41).

The development of the Self-Contained Underwater Breathing Apparatus (SCUBA) in 1946 by Emile Gagnan and Jacques-Yves Cousteau (Joiner 2001: 1.3 – 1.4) represented a breakthrough in underwater exploration, which was reflected on the development of underwater archaeology. Between 1952 and 1957 Cousteau and his team of divers excavated a Roman shipwreck site at the foot of the rocky island of Grand Congloué, off Marseille. During the project numerous equipment and techniques were experimented and developed for underwater excavation; such techniques are now considered standard in many underwater archaeological projects. However, the Grand Congloué excavation witnessed some serious methodological problems, due to the limited involvement of

archaeologists in the project, which resulted, at that time, in the misinterpretation of the site (Sibella 1997: 174-5). Another significant stage in the development of Maritime Archaeology in the Mediterranean was the excavation of the Albenga Roman shipwreck by the Italian archaeologist Nino Lamboglia, between 1961 and 1971. In addition to its archaeological importance as one of the largest Roman shipwrecks found in the Mediterranean, the Albenga shipwreck excavation was directed by an archaeologist, and a number of archaeologists contributed to the study of the excavated material. However, Lamboglia did not think that archaeologists should dive, so none of the archaeologists involved in the project dived on the site. Rather, they remained on surface, managing the excavation remotely and interviewing the divers who collected the artifacts to try to establish their provenance (Carlson 2011: 382).

Perhaps a key turning point in the history of Maritime Archaeology in the Mediterranean took place in the 1960s. It was during that decade that the first scientific underwater excavations took place, and publications about the theory and practice of underwater archaeology started to appear (Dumas 1962; Frost 1963; Taylor 1965; Bass 1966; Throckmorton 1969).

In the 1960s, the excavation of the Late Bronze Age shipwreck off southern Turkey's Cape Gelidonya was the first underwater archaeological project to be carried out according to archaeological scientific standards. The site was originally discovered by Turkish sponge divers. However, it was excavated by a team of sport divers and amateur archaeologists led by the pioneer maritime archaeologist George Bass. The Cape Gelidonya shipwreck was the first one to be excavated entirely underwater and it proved that underwater archaeological sites could be excavated and studied as rigorously as terrestrial sites and according to the same archaeological standards (Bass 2005: 48-55). In the following years, Bass published his first book, which discussed several theoretical, methodological, and practical aspects of conducting archaeological work underwater (Bass 1966). In addition to

the study of ancient shipwrecks, the study of harbors and submerged landscapes also started developing in the 1960s and 1970s (Flemming 1971). The work that Honor Frost did was probably the first in that respect in the Mediterranean. She was a pioneer female underwater archaeologist who had worked with Bass on the Cape Gelidonya shipwreck. She had a special interest in the study of anchors and harbors in the Eastern Mediterranean and had worked extensively in the Levantine coast. Her 1963 book was the first to discuss different aspects of harbor and port archaeology in that region (Frost 1963).

Perhaps, one of the most important publications which represented international recognition for the new field of underwater archaeology was *Underwater Archaeology: A Nascent Discipline* (UNESCO 1972). Not only it contained contributions from a number of archaeologists presenting different maritime and underwater sites, but also it discussed an array of archaeological, methodological, and technical aspects of maritime and underwater archaeology.

The foundation of the Institute of Nautical Archaeology (INA) in 1973 by George Bass and a number of his colleagues was a major step in maritime archaeological research in the Mediterranean. Since then, the INA has carried out numerous surveys and excavations in different Mediterranean countries. It also has contributed to training many archaeologists from those countries in aspects of underwater archaeology. The INA also contributed to the creation of one of the earliest museums of underwater archaeology, the Bodrum Museum of Underwater Archaeology in Turkey.

Few years following the UNESCO 1972 publication, one of the most important volumes on maritime archaeology was published (Muckelroy 1978). In addition to discussing different types of sites and the special qualities of underwater archaeology, the book presented, for the first time, a theoretical framework for the formation of underwater archaeological sites. Muckelroy's contribution has been the basis upon which numerous further studies and discussions were based. His volume is still considered a turning point in the development of maritime archaeology.

Key Issues/Current Debates

For the past 50 years, hundreds of sites were discovered and numerous surveys and excavations were carried out for different types of maritime and underwater archaeology sites all over the Mediterranean (Parker 1992). Accordingly, the field of maritime archaeology witnessed substantial development, particularly from a methodological and technological perspective (Green 2004). Advanced technology used for underwater archaeological investigation, such as underwater acoustics, and underwater imagery techniques became widespread and readily available for researchers and institutions working in underwater archaeology. Moreover, during the past two decades the investigation and study of underwater archaeological sites in deep water using remote sensing techniques became quite common in several northern Mediterranean regions (Ballard et al. 2000; Wachsmann 2011). Despite its high cost, these projects proved the possibility of exploring underwater sites beyond diving limits, using nonintrusive methods, especially since the sites located in deep waters are often in a good preservation condition.

However, the large number of underwater archaeological excavations which took place in the Mediterranean during the past five decades yielded thousands of artifacts of different types, materials, and dates, which required extensive resources for conservation, storage, and display. Therefore, maritime museums and museums for underwater archaeology have been established in a number of Mediterranean countries, mainly to display material culture which has been excavated from underwater. It is worth mentioning, however, that there is a complete absence of maritime museums in most southern and eastern Mediterranean countries, which has negatively affected public awareness of maritime and underwater archaeology in that region.

Despite the existence of specialized conservation facilities and maritime museums in several Mediterranean countries, it became evident that underwater archaeology is significantly costly and time-consuming, not only for the excavation phase but also mainly for the

conservation and management of the excavated material (Robinson 1998: 11).

Shipwreck excavations in the Mediterranean often come across submerged cargoes that include tens, hundreds, hundreds, and sometimes thousands of amphorae. Raising them and hence providing storage often represents a serious challenge for the museums. On the other hand, the conservation of organic material such as ship timbers could take many years to be accomplished, which requires considerable financial and material resources.

Therefore, during the past decade, there has been an evident change of concepts in underwater archaeology, from excavations and retrieving of artifacts to the management and in situ preservation of submerged archaeological sites. It was realized that excavations are not always the best ways for dealing with underwater archaeological sites and that there are other options which are more preferable in many cases. The UNESCO (2001) Convention on the Protection of the Underwater Cultural Heritage asserts that “the in situ preservation of underwater cultural heritage shall be considered as the first option before allowing or engaging in any activities directed at this heritage.” Therefore, there has been an international trend towards the preservation of underwater archaeological sites where they are found and more focus in being put on underwater surveys and mapping of sites rather than full excavations. Accordingly, several northern Mediterranean countries are conducting large-scale surveys and mapping projects of their coasts in order to assess their maritime archaeological resources and develop methods for protecting and preserving them. On the other hand, different methods and techniques for the in situ preservation of underwater sites have been developed and tested in Mediterranean countries (Zmaić 2009). However, in situ preservation of underwater archaeological sites raised another issue concerning the presentation of those sites to the public. How can the sites be protected in situ and yet be available for public enjoyment and education? The options were either to bring the visitors physically to underwater sites or to bring these sites virtually to the visitors. The first option

is represented by underwater archaeological parks and cultural dive trails which have been developed in some Mediterranean countries such as in Italy, Croatia, Greece, Turkey, and Israel. This mainly targets the diving community which forms the majority of the visiting public to these types of sites. On the other hand, the great development in information technology and digital imaging has enabled transmitting information about the underwater archaeological sites to the wide public through virtual reality images, 3D projections, and holographic displays; all can be utilized in museums to bring the underwater sites to the public (Manders 2008: 35-39).

Another aspect of maritime archaeology which has witnessed a significant development in the past years in Mediterranean countries is education and training. A number of Mediterranean countries have introduced studies in different aspects of maritime and underwater archaeology into their university curricula (UNESCO 2010). Also several countries, such as Turkey, Egypt, Croatia, Malta, and Spain, in collaboration with the UNESCO, have organized workshops and training programs in underwater archaeology and the conservation of underwater finds. This has significantly contributed to building capacity in that field.

Finally, in most Mediterranean countries, there are currently dedicated units within the national archaeology authorities specialized in underwater cultural heritage. Such units are normally responsible not only for conducting underwater archaeological projects within their respective countries, but also for overseeing and organizing work done by other archaeological missions or groups working within the countries' territorial waters.

International Perspectives

The development of maritime and underwater archaeology in Egypt has not differed significantly from other Mediterranean regions (Khalil & Mostafa 2002). However, one of the earlier discoveries in that field took place in the desert rather than underwater. In 1894, at least five boats

from the Middle Egyptian Kingdom were found at Dashur south of Cairo (Haldane 2000: 83-102). The discovery of the Dashur boats could be considered the beginning of maritime archaeology in Egypt. It was followed by the discovery of several other boat and ship burials such as the Old Kingdom royal ships of Khufu in 1954 and the Early Dynastic boats of Abydos in 1991 (Haldane 2000: 39-43, 45-60).

Nevertheless, underwater archaeology in Egypt can be generally divided into two phases. The first phase started at the beginning of the twentieth century with the efforts of sport divers and amateur archaeologists, and it is mainly characterized by accidental discovery of underwater archaeological sites in the Alexandria region and hence the subsequent salvage operations which were carried out at those sites. The most important discoveries of that period were the pre-Hellenistic harbor of Pharos in 1912 and the submerged remains of the ancient lighthouse of Alexandria in the 1960s (Morcos 2000). The second phase of underwater archaeological research in Egypt started in the mid-1990s with two significant projects: the excavation of the submerged remains of the ancient Pharos lighthouse of Alexandria (La Riche 1996) and the excavation of submerged Ptolemaic royal quarters at the Eastern Harbor of Alexandria (Goddio et al. 1998). In addition to the archaeological value and significance of those two projects, they have shed light on the potentials of underwater archaeology in Egypt and opened the door to many projects that took place in the Alexandria region. However, it is worth mentioning that all the underwater archaeological research that took place in Alexandria has been concerned with submerged structures and landscape rather than shipwrecks. Nonetheless, a major drawback in underwater archaeology in the Egyptian Mediterranean waters is that it almost entirely focused on Alexandria, with very limited projects conducted elsewhere. Moreover, the Egyptian contribution to such projects was quite limited as the work was mainly carried out by foreign teams, yet the projects provided a great opportunity for training young Egyptian archaeologists on different aspects of underwater archaeology, which led

to the establishment of the Department for Underwater Archaeology (DUA) in 1996 as part of the Egyptian Supreme Council of Antiquities (SCA), the authority responsible for overseeing all archaeological work in Egypt. The establishment of the DUA was a governmental recognition of the significance of underwater archaeological research in Egypt.

In addition to the archaeological projects that took place under Egyptian waters, a number of other important maritime sites were discovered and studied along the shores of Lake Mareotis west of Alexandria. This included some of the most significant lake harbors and lacustrine waterfront structures in the Mediterranean (Blue 2010; Blue & Khalil 2011).

Nonetheless, a major problem in maritime archaeology in Egypt is related to its public presentation and appreciation. Despite its long and significant history, and the number of maritime archaeological sites that have been investigated, Egypt does not have a maritime museum, and the public presentation of maritime and underwater archaeology is insignificant, which has several shortcomings related to public awareness and knowledge of the Egyptian maritime cultural heritage. Nevertheless, Egypt has excelled in specialized education in Maritime Archaeology with the establishment of the Alexandria Centre for Maritime Archaeology and Underwater Cultural Heritage in 2009 as the first academic center in the Southern Mediterranean concerned with providing education and training at different levels in aspects of that field. The center targets students from Egypt, the Mediterranean, and the Arab Region; therefore, the education and training that the center provides would contribute to the development of maritime and underwater archaeology by creating generations of educated and trained maritime archaeologists.

Future Directions

It is evident that maritime and underwater archaeology in the Mediterranean has gone through different stages of conceptual, methodological,

and technical development since the 1960s. Turning away from complete excavations of specific sites to surveying and mapping of large areas have been a distinctive feature of numerous projects that took place during the past decade. However, it is expected that the future will be characterized by multinational projects that are carried out between several countries and which emphasize on specific aspects related to maritime archaeology such as preservation, capacity building, and cultural tourism. Some EU-funded projects, which have already been initiated, were associated with underwater archaeology, such as the Project on Integrated Maritime Policy for the Mediterranean (IMP-MED), which is part of the European Neighbourhood and Partnership Instrument (ENPI), and also the EU (Tempus) Program, which funded the creation of the Alexandria Centre for Maritime Archaeology and Underwater Cultural Heritage in Egypt. On the other hand, the UNESCO secretariat of the Convention on the Protection of Underwater Cultural Heritage has been very active in collaborating with different Mediterranean countries, especially in disseminating the ideas and principles of preservation and public education. During the coming years, the EU will hopefully play an even greater role in funding projects related to site management, education, and training in maritime archaeology in the Mediterranean region. On the other hand, it is expected that more research projects will be carried out in deep and international waters. These are getting more and more accessible with the advances in remote sensing technology, particularly the use of the Autonomous Underwater Vehicles (AUV). Furthermore, in countries where maritime archaeology is still a nascent discipline, such as most Mediterranean Arab Countries, it is anticipated that such countries will put more emphases on the exploration and hence the preservation and public presentation of their cultural heritage. Also regional collaboration in education and training of maritime archaeologists has started and is expected to develop further in the future especially between countries witnessing recent political changes.

Cross-References

- ▶ [Experimental Maritime Archaeology](#)
- ▶ [In Situ Preservation of Shipwreck Artifacts](#)
- ▶ [Port of Alexandria: Underwater Archaeology](#)
- ▶ [Underwater Cultural Heritage: International Law Regime](#)
- ▶ [Underwater Sites in Archaeological Conservation and Preservation](#)

References

- BALLARD, R.D., A.M. McCANN, D. YOERGER, L. WHITCOMB, D. MINDELL, H. SINGH, B. FOLEY, J. ADAMS, D. PIECHOTA & C. CIANGRADE. 2000. The discovery of ancient history in the deep sea using advanced deep submergence technology. *Deep-Sea Research I* (47): 1591-1620.
- BASS, G. 1966. *Archaeology underwater*. London: Thames & Hudson.
- 2005. Cargo from the Age of Bronze: Cape Gelidony, Turkey, in G. Bass (ed.) *Beneath the Seven Seas*: 48-55. London: Thames and Hudson.
- BLOT, J.-Y. 1996. *Underwater archaeology: exploring the world beneath the seas*. London: Thames a Hudson Ltd.
- BLUE, L. (ed.) 2010. *Lake Mareotis: reconstructing the past* (British Archaeological Reports International series 2113). Oxford: Archaeopress.
- BLUE, L. & E. KHALIL. (ed.) 2011. *A multidisciplinary approach to Alexandria's economic past: the Lake Mareotis Research Project* (British Archaeological Reports International series 2285). Oxford: Archaeopress.
- CARLSON, D. 2011. The seafarers and shipwrecks of ancient Greece and Rome, in A. Catsambis, B. Ford & D. Hamilton (ed.) *The Oxford handbook of maritime archaeology*: 379-405. Oxford: Oxford University Press.
- DUMAS, F. 1962. *Deep-water archaeology*. London: Routledge & Kegan Paul Ltd.
- FLEMMING, N. C. 1971. *Cities in the sea*. New York: Doubleday & Company.
- FROST, H. 1963. *Under the Mediterranean*. London: Routledge & Kegan Paul Ltd.
- GODDIO, F., A. BERNAND, E. BERNAND, E. DARWISH, Z. KISS & J. YOYOTTE. 1998 (ed.) *Alexandria: the submerged royal quarters*. London: Periplus.
- GREEN, J. 2004. *Maritime archaeology: a technical handbook*. San Diego: Elsevier Academic Press.
- HALDANE, C. 2000. *Sacred and secular: ancient Egyptian ships and boats*. Dubuque: Kendall/Hunt Publishing Company.

- JOINER, J.T. 2001. *NOAA diving manual*. Flagstaff: Best Publishing Company.
- KHALIL, E. & M. MOSTAFA. 2002. Underwater archaeology in Egypt, in C. Ruppe & J. Barstad (ed.) *International handbook of underwater archaeology* (Plenum Series in Underwater Archaeology): 519-39. New York: Kluwer Academic.
- MANDERS, M. 2008. In situ preservation: the preferred option. *Museum International* 240: 31-41. UNESCO.
- MORCOS, S. 2000. Early discoveries of submarine archaeological sites in Alexandria, in M. H. Mostafa, N. Grimal & D. Nakashims (ed.) *Underwater archaeology and coastal management: focus on Alexandria*: 33-45. Paris: UNESCO Publishing.
- MUCKELROY, K. 1978. *Maritime archaeology*. Cambridge: Cambridge University Press.
- NORWICH, J.J. 2007. *The Middle Sea: a history of the Mediterranean*. London: Vintage Books.
- PARKER, A.J. 1992. *Ancient shipwrecks of the Mediterranean and the Roman Provinces* (British Archaeological Reports International series 580). Oxford: Tempvs Reparatvm.
- ROBINSON, W. 1998. *First aid for underwater finds*. London: Archetype Publications.
- SCARRE, C. & B.M. FAGAN. 2008. *Ancient civilizations*, 3rd edn. New Jersey: Pearson Education.
- SIBELLA, P. 1997. Grand Congloué, in J. P. Delgado (ed.) *Encyclopaedia of underwater and maritime archaeology*: 174-75. London: The British Museum Press.
- TAYLOR, J. (ed.) 1965. *Marine archaeology*. New York: Thomas Y. Crowell Company.
- THROCKMORTON, P. 1969. *Shipwrecks and archaeology: the unharvested sea*. Boston: Atlantic Monthly Press.
- 1991. The road to Gelidonya, in P. Throckmorton (ed.) *The sea remembers: shipwrecks and archaeology*: 14-24. New York: Smithmark Publisher.
- UNESCO. 1972. *Underwater archaeology: a nascent discipline*. Paris: UNESCO.
- 2001. Convention on the Protection of the Underwater Cultural Heritage. Paris: UNESCO. Available at: <http://unesdoc.unesco.org/images/0012/001260/126065e.pdf>.
- 2010. Courses in underwater archaeology at universities and other institutions. Paris: UNESCO. Available at: <http://unesdoc.unesco.org/images/0015/001514/151452e.pdf>.
- WACHSMANN, S. 2011. Deep-submergence archaeology, in A. Catsambis, B. Ford & D. Hamilton (ed.) *The Oxford handbook of maritime archaeology*: 202-31. Oxford: Oxford University Press.
- ZMAIĆ, V. 2009. The protection of Roman period shipwrecks in-situ: underwater museums, in L. Beric & L. Miholjek (ed.) *Exploring underwater heritage in Croatia: a handbook*: 20-21. Zadar: International Centre for Underwater Archaeology.

Further Reading

- BASS, J. 2011. The development of maritime archaeology, in A. Catsambis, B. Ford & D. Hamilton (ed.) *The Oxford handbook of maritime archaeology*: 3-22. Oxford: Oxford University Press.
- GRENIER, R., D. NUTLEY & I. COCHRAN. 2006. *Underwater cultural heritage at risk: managing natural and human impacts*. Paris: ICOMOS.
- HOCKER, F. & C. WARD. 2004. *The philosophy of ship-building*. College Station: Texas A&M University Press.
- JONDET, G. 1912. Les ports antiques de Pharos. *Bulletin de la Société Archéologique d'Alexandrie* 14: 252-66.

Meehan, Betty

Sally Brockwell

Australian National University, Canberra, ACT, Australia

Basic Biographical Information

Betty Francis Meehan was born in Bourke, New South Wales, Australia, in 1933 and grew up there, the elder daughter of Francis Owen and Olive Jane Meehan. After completing high school in Bourke, she trained as a specialist infants teacher at Bathurst Teachers College and later taught in Sydney, Bourke, Darwin, and Canberra. In 1958, she travelled to Arnhem Land in northern Australia, accompanying her first husband, the late Lester Richard Hiatt, on fieldwork for his anthropology Ph.D. There she set up the first school for Aboriginal children at Maningrida. She went on to study at the University of Sydney and gained a Bachelor of Arts (Hons) and Master of Arts (Hons) in anthropology. In 1972, she enrolled in a Ph.D. in the Department of Prehistory and Anthropology at the Australian National University (ANU) in Canberra and returned to Arnhem Land for her fieldwork with her second husband, collaborator, and colleague, the late Rhys Maengwyn Jones. She graduated in 1975 (Fig. 1).

Betty's Ph.D. thesis became the basis for her iconic book *Shell Bed to Shell Midden* (Meehan 1982) for which she became internationally

Claire Smith
Editor

Encyclopedia of Global Archaeology

With 2619 Figures and 106 Tables

 Springer Reference

Editor

Claire Smith
Department of Archaeology
Flinders University
Adelaide, SA
Australia

ISBN 978-1-4419-0426-3 ISBN 978-1-4419-0465-2 (eBook)
ISBN 978-1-4419-0466-9 (print and electronic bundle)
DOI 10.1007/978-1-4419-0465-2
Springer New York Heidelberg Dordrecht London

Library of Congress Control Number: 2013953915

© Springer Science+Business Media New York 2014

This work is subject to copyright. All rights are reserved by the Publisher, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, reuse of illustrations, recitation, broadcasting, reproduction on microfilms or in any other physical way, and transmission or information storage and retrieval, electronic adaptation, computer software, or by similar or dissimilar methodology now known or hereafter developed. Exempted from this legal reservation are brief excerpts in connection with reviews or scholarly analysis or material supplied specifically for the purpose of being entered and executed on a computer system, for exclusive use by the purchaser of the work. Duplication of this publication or parts thereof is permitted only under the provisions of the Copyright Law of the Publisher's location, in its current version, and permission for use must always be obtained from Springer. Permissions for use may be obtained through RightsLink at the Copyright Clearance Center. Violations are liable to prosecution under the respective Copyright Law.

The use of general descriptive names, registered names, trademarks, service marks, etc. in this publication does not imply, even in the absence of a specific statement, that such names are exempt from the relevant protective laws and regulations and therefore free for general use.

While the advice and information in this book are believed to be true and accurate at the date of publication, neither the authors nor the editors nor the publisher can accept any legal responsibility for any errors or omissions that may be made. The publisher makes no warranty, express or implied, with respect to the material contained herein.

Printed on acid-free paper

Springer is part of Springer Science+Business Media (www.springer.com)

For Jacko

Also dedicated to

James Alexander Smith

Annette Pauline Vera Smith

Charles Thurstan Shaw

Thomas Walter Willis

Preface

Archaeology – the study of human cultures through the analysis and interpretation of artifacts and material remains – continues to captivate and engage people on a local and global level. The significance of such international heritage sites such as the pyramids – both Egyptian and Mayan – the Lascaux caves, Stonehenge, and Petra all provide insights into our ancestors and their actions and motivations. However, there is much more to archaeology than famous sites. When archaeologists are asked to elaborate about their job, they will touch on archaeological theory, chemistry, geology, history, classical studies, museum studies, ethical practice, and survey methods, along with the analysis and interpretation of their sites. Archaeology is a much broader subject than its public image and branches out to many other fields in the social and hard sciences.

The *Encyclopedia of Global Archaeology* provides a comprehensive and systematic coverage of archaeology that is unprecedented. It encompasses the breadth of the subject area along with those aspects that are tapped by other disciplines. In addition, it encompasses all time periods and regions of the world and all stages of human development. The entries range from succinct summaries of specific sites and the scientific aspects of archaeological enquiry, to detailed discussions of archaeological concepts, theories, and practice, the social and political dimensions of archaeology and archaeological ethics. The different forms of archaeology are explored, along with the techniques used for each and the challenges, concerns, and issues that face archaeologists today.

This 11 volume *Encyclopedia of Global Archaeology* is available in both print and eReference versions. The print version has 1,625 contributions from 1,356 authors and over 11,634 cross-references. At the time of publication, another 200 entries have been commissioned for the eReference version. Through constant updating, the eReference version of the *Encyclopedia of Global Archaeology* will continue to access the best scholarship from around the world. Our aim is to ensure that this reference work will be as useful in twenty years as it is in two years.

An Encyclopedia for a Global World

The *Encyclopedia of Global Archaeology* was designed to be a definitive reference work for archaeologists, cultural heritage managers, and the general public. Its major aim is to disseminate global expertise in archaeology.

We have achieved this through four innovations: an unparalleled level of contributions from archaeologists who do not normally publish in English, the conscious inclusion of multiple perspectives on key topics, biographies of major archaeological figures from throughout the world, and the combination of print and continuously up-dated eReference publication.

The first major challenge for this encyclopedia was to access the best scholarship in the world. However, there was a fundamental problem – archaeological experts around the globe do not always write in English. The best scholars from throughout the world write in a variety of languages. For example, the problems of site conservation and preservation can be very different in different parts of the world – and the experts publish in their own languages. Moreover, not all specialist knowledge is published in English. Some of the most advanced thinking on archaeological theory comes from South America, while the French and Spanish have the deepest knowledge of Upper Palaeolithic rock art and the place to learn about large-scale urban excavations or historic reconstructions is Japan. The experts from these countries publish their research in their own language. While some also publish in English, many don't – and even scholars who speak English can be reluctant to publish in English, as they may not have the level of written competency to fully express the complexity of their ideas.

The answer was to allow non-English-language speakers to contribute to the encyclopedia in their own language. This accessed a torrent of hitherto untapped expertise. Around 140 entries and more than 300,000 words in the *Encyclopedia of Global Archaeology* have been translated from French, Italian, Portuguese, Russian and Spanish. In addition, many more entries were submitted by authors whose first language is Chinese, German, Japanese or Turkish. Often, these entries involved significant editing, re-writing, and polishing in order to ensure academic standards and clear communication. This painstaking work was undertaken by the editors of the relevant sections and by myself. The authors and translators often had to review several versions of the text, and they did this without complaint. This cooperative and cosmopolitan approach has brought enormous strengths to the encyclopedia and produced something that is quite different to what has come before.

The second challenge was to maximize the value of the *Encyclopedia of Global Archaeology* as a teaching resource for schools, colleges, and universities. Some of the best learning is achieved through comparison and debate. Accordingly, we have included multiple and regional perspectives on key topics to facilitate comparisons, especially at a global level, and provide rich materials for classroom debates. The ethics of commercial archaeology, for example, has individual entries that provide perspectives from Australia, Brazil, Japan, Nigeria, Southern Africa and the USA. While each entry provides an in-depth discussion of the issues that affect a particular region, taken together, these entries provide the materials required for students to undertake analyses of contrasts and comparisons at a global level.

The third challenge was to honor the work of archaeologists from throughout the world. The biographies in the encyclopedia were selected by section editors on the basis of the contribution of particular archaeologists to specific

disciplinary areas and also through recommendations from archaeologists in underrepresented countries. While we attempted to obtain some form of uniform global coverage in archaeological biographies, this was not possible as archaeology is at different stages of development in different parts of the world. The need to build archaeological capacity is greatest on the African continent. The small number of biographies of African archaeologists reflects the small number of archaeologists in the continent as a whole. While the vast majority of these archaeologists are located in South Africa, there are key nodes in countries such as Kenya and Nigeria. Sometimes these nodes are an outcome of capacity building that occurred as part of colonial processes, as with the life work of Charles Thurstan Shaw. Some biographies honor the work of archaeologists who spent their lives building capacity in a part of the world that is not their home country, as with the work of Betty Meggers in South America. All of the biographies provide insights into the life histories of archaeologists in various periods and in diverse parts of the world. Moreover, cultural attitudes are apparent in the profiles of biographies for each region. For example, while many Portuguese biographies are of mid-career archaeologists who are still alive, the majority of biographies of Japanese archaeologists are of people who established important facets of the profession and have now passed away.

The final challenge was to harness the potential of an online environment not only to ensure global accessibility but also to enrich the encyclopedia's content. From the beginning, the *Encyclopedia of Global Archaeology* was conceived firstly as an online reference work, and then as a print reference. This interactive, online reference uses dynamic content to deepen discussions and to update material published in the print version, and to add information on new finds, or new ways of approaching the material. Hot links and extensive cross-references between keywords and related articles provide topics with greater depth and enable efficient searches in a user-friendly manner. The important innovation here is the continuous updating of entries and the addition of new entries to the eReference version. This will ensure that the encyclopedia maintains ongoing relevance.

15 July, 2013

Professor Claire Smith
Adelaide, Australia

Acknowledgments

My motivation to produce an encyclopedia originated in my childhood, when my mother, Annette Smith, used her hard-won wages to purchase weekly installments of the *Columbia Encyclopedia*, a one-volume encyclopedia produced by Columbia University Press. Each week, my sister, Jo, and I would take pleasure in discussing the newest entries with our mother. It was in these conversations that we both learnt a love of scholarship. Decades later, in 2008, the genesis of the *Encyclopedia of Global Archaeology* arose out of a conversation between Teresa Krauss, a senior editor at Springer, and myself over lunch at a restaurant in Vancouver. This first discussion was followed by workshops and meetings in Atlanta, Dublin, Memphis, Hawaii, and, regularly, New York. It has taken five years to bring this encyclopedia to fruition.

While this encyclopedia is much more than the sum of its parts, each of these parts was essential to the final product. There are many people to thank. I am grateful to the individual authors, who have shared their knowledge and expertise. The vision and architecture of this encyclopedia has been steered by the International Advisory Board, while the untiring efforts of section editors ensured that high quality and polished entries came in on time. In addition, I thank the members of our editing and production team, which includes all of the translators, but especially Lilén Malugani Guillet from Universidad Nacional de Catamarca in Argentina; administrative assistant, Cristina Lanteri; in-house editor, Christine Hausmann; and managing editor, Jo Smith. Each person has provided contributions that are essential to the success of the encyclopedia.

I thank the following people who helped me to proof read the 8,160 pages of the Encyclopedia: Heather Burke, Cherrie de Lieuen, Dianne Riley, Peta Straiton, Bradley Guadagnin, Chelsea Colwell-Pasch and Vanessa Sullivan.

Those who seek insight into the role of the editor should look up the YouTube clipping “C is for Contrafibularity,” from the BBC program *Blackadder*, in which the writer Samuel Johnson celebrates having completed his lifework of a dictionary with every word in the English language – only to be accosted by a host of new words. Like the English language, archaeology is constantly changing and growing. While this is the most globally comprehensive encyclopedia of archaeology produced to date, it is not possible to have an entry on every possible subject. People should use this encyclopedia as a first stop for obtaining information on a topic and as a directory to further

specialist information. Those seeking greater knowledge on a specific topic should use the reading lists provided to identify specialist publications. Readers should be prepared for some of these readings to be in a language other than English.

The translated entries, which are a critical and definitive characteristic of this encyclopedia, have been made possible through support from Springer-Verlag and through two grants from Flinders University in South Australia, one from the Faculty of Education, Humanities and Law and one from the School of Humanity. This support has allowed the encyclopedia to contribute to the democratization of archaeology globally. By accessing the work of the finest scholars, no matter what language they write in, we have replaced English-language networks with *international* networks and produced an encyclopedia that is truly global in scope.

15 July, 2013

Professor Claire Smith
Adelaide, Australia

Maritime archaeology (also known as marine archaeology) is a discipline within archaeology as a whole that specifically studies human interaction with the sea, lakes and rivers through the study of associated physical remains, be they vessels, shore-side facilities, port-related structures, cargoes, human remains and submerged landscapes. A specialty within maritime archaeology is nautical archaeology, which studies ship construction and use. The history and development of Maritime Archaeology as a scientific discipline is closely related to the Mediterranean Sea, which has been a witness to some of the oldest civilizations in the world. Along its shores flourishes the Ancient Egyptian, the Phoenician, the Greek, the Roman, the Byzantine, and the Islamic civilizations (Norwich 2007; Scarre & Fagan 2008). Accordingly, throughout the ages, maritime activities played a major role in the rise, development, and decline of such civilizations and societies. On the other hand, their maritime activities have left an array of material cu The archaeological study of the Mediterranean sea and its coasts is, for the most part, thought of as underwater archaeology, and the history of maritime archaeology in the Mediterranean has conventionally been conceived as the story of underwater exploration 1 â€¢ However, the discipline of archaeology as a whole has continued to develop, and the concern with conceptual issues which has characterized much archaeological. scholarship in recent years is having an effect on the study of cultural remains found, not just on land, but in the sea as well. This paper will start with a brief review of th Maritime archaeology and marine geophysics will work together recording, dating and understanding the submerged cultural heritage of Bulgaria, contributing to our knowledge of the prehistoric and historic environmental record of human activity in this region. Explore. The Black Sea of Bulgaria.Â She completed her PhD at Cambridge University studying Mediterranean obsidian circulation and maritime travel in the Neolithic. This research led into a post-doctoral position at Cambridge University and a fellowship within the McDonald Institute for Archaeological Research. In 2009 she was awarded a Leverhulme fellowship to study the prehistoric submerged landscapes of the Solent and the dynamic relationship between people and their changing environment as sea-levels rose during the Holocene. With 95 percent of the seafloor not yet explored, oceanographers and maritime archaeologists look to the deep waters of the Mediterranean and Aegean seas for shipwrecks that can be used to tell the story of ancient civilizations throughout the region. Grades. 6 - 12+.Â The excavation of the Cape Gelidonya shipwreck off the south coast of Turkey in the 1960s was an important event for the field of maritime archaeology for three main reasons: It was the first excavation where the supervising archaeologist, George Bass, both dove to and excavated a site; it was the first time where land-based archaeological techniques were adapted for the.