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IN POSEIDONS REICH XII

Shipwrecks: Expressive Testimonies of Ancient Ship Catastrophes

organised by

German Society for the Promotion of Underwater Archaeology



in cooperation with

**Römisch-Germanisches Museum
Municipality of Cologne**



and

**Department of Archaeology
Faculty of Philosophy
University of Cologne**



The Conference Committee:

Dr. Marcus H. Hermanns / Daniel Zwick M.A.

A·B·S·T·R·A·C·T·S



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Olivier Berger

Institut Européen d'Archéologie Sous-Marine (IEASM)



O. Berger

Conservation-Restoration of underwater heritage. Logistics and preparations for a touring exhibition.

For almost ten years, the IEASM (institut européen d'archéologie sous-marine) conducted by Franck Goddio is carrying out underwater excavations in the bay of Aboukir. The two ancient cities of Canopus and Herakleion discovered under the floods of the Nile yielded abundant material and especially monumental stone work. We have a laboratory on the boat that allow us to make interventions as soon as the objects are out of the water. The first steps of conservation are made *in situ* and the following treatments are made in another laboratory in Alexandria. The laboratory has a diversity of equipment to face the different alterations that we encounter. The treatments can be mechanical, chemical or by electrochemical. The materials to treat are as diverse as ceramics, various stones, diverse metals and organic material.

The public exhibition of 2006 that include the three colossus and the monumental stele required a large scale of conservation-restoration work in Egypt. To bring this project to life we went through a real challenge. The results of this restoration work will be presented to you through the exhibition of Berlin and Paris.





Dr. Hélène Bernard

Département des Recherches Archéologiques Subaquatiques
et Sous-Marines (DRASSM)



H. Bernard

A snake vase from the Strait of Bonifacio

A quite exceptional piece of pottery was found during a confiscation of finds, which a diver has illegally salvaged from underwater sites in Bonifacio. A lot of wrecksites are known, from the first exploratory dives made by R. Lederer during the seventies, around the islands Lavezzi and Cavallo. Due to the condition of the wreck, being situated in rocky shallow waters, and the proximity to other wrecksites in this area, a possible association to Dr 2/4 (according to the diver) is unproven. A further underwater exploration should be made.

The typology of this kind of ceramic is quite distinctive, although some of the characteristics of this vase are already known. The dedication suggest that this object was used for worship.





O. Bounegru

Prof. Dr. Octavian Bounegru

Facultatea de Istorie
Universitatea "Al. I. Cuza" Iasi



The wreck from the harbour of Callatis (west Pontic coast): a historical and archaeological investigation

In the wake of underwater archaeological expeditions at the west Pontic coast, i.e. in the area of the town of Callatis (formerly the Greek colony of Mangalia and later Roman town), several fragments from ancient shipwrecks were found. The results of these investigations have been only partly published. One of the wrecks is of special importance: Many wooden fragments of the ship's keel were found and also numerous Hellenistic amphorae from Rhodos, Chios, and Thasos. Evidently the ship transported these amphorae. Also remains of the ship's superstructure were found, for instance roofing tiles from the cabin. The wreck yields important information about the transport of amphorae in the west Pontian area.





P. Carvalho

Dr. Patrícia Carvalho
Dr. José Bettencourt

Centro Nacional de Arqueologia
Náutica e Subaquática



The *Ria de Aveiro* A shipwreck (Ílhavo, Portugal): an archaeological contribution to the study of navigation and commerce in the beginning of the modern period

In this paper we present the results of the archaeological excavations carried out in Ria de Aveiro A between 2000 and 2005, where a shipwreck site was found in the Aveiro lagoon system (Ílhavo; Portugal), which dates to the XV - XVI century. The excavations carried out in the vicinity of the hull remains, which were already recovered in 1999, have revealed a continuous horizontal and vertical artefact distribution pattern, which includes an extensive concentration of ceramic finds - the ship's main cargo. It yielded also associated organic deposits that contained fruit remains and fragments of wooden artefacts. The historical and geographic context reveals a significant change of the navigation conditions in the region, after the shipwreck event. The preliminary examination of the ceramics cargo reveals a close homogeneity of the earthenware finds, represented by red and black fabrics from the Aveiro/ Ovar region. The preliminary revision of the spatial distribution of these kinds of products suggest an extensive commercial and geographic spread (Porto, Madeira islands, Azores islands, Southampton, Florida, Newfoundland, etc.) that reflects the emerging global seafaring after the XV century on the Atlantic Ocean.





K. Dellaporta

Katerina Dellaporta

Ephorate of Underwater Antiquities
Hellenic Ministry of Culture

HELLENIC
Ministry of **Culture**

Deepwater archaeological surveys: the legal framework for cultural management and protection and the challenge of tourist development.

This paper aims to present:

- a) the underwater archaeological surveys that the speaker has carried out from 1999 to 2006 with the introduction of deepwater high technology,
- b) the perspectives that are opened to archaeologists by these new technologies as well as the access of the wider public to the underwater cultural heritage,
- c) the threats of tourist looting of underwater sites and the question how the legal framework could preserve the underwater cultural heritage for future generations from the potential risks.





Dr. Frederick Hocker

Vasa Museum



F. Hocker

The Swedish warship VASA: Myth and Reality

Since it was raised in 1961, Gustav Adolf's VASA has become one of the major tourist attractions in Scandinavia and a potent international symbol of Sweden's "Golden Age" in the 17th century, but the popular perception of the ship, its loss and its rediscovery are largely based on legend rather than careful historical or archaeological research. This paper examines three widespread myths about the ship -- that its size was altered during construction, that it was forgotten for three centuries, and that it was found by an amateur archaeologist working alone -- and asks how these ideas were created and became fixed in the public (and academic) consciousness. Most notably, the memory of the sinking of the king's new flagship remained a powerful event in the collective memory of Stockholm and the Swedish navy until it was rediscovered in 1956. By analysis of the primary historical sources and the ship itself, it also presents what we currently believe the reality to be, and how we can present this new information to the public.





F. Huber

Florian Huber
Erich Halbwidl

Arbeitsgruppe für maritime und limnische Archäologie
(AMLA) / Christian-Albrechts-Universität Kiel



10 years *Arbeitsgruppe für maritime und limnische Archäologie (AMLA) at the Christian-Albrechts-Universität Kiel - 10 years of shipwreck research**

In Spring 1997 the *Arbeitsgruppe für maritime und limnische Archäologie** (AMLA) was established at the Department for Prehistory at the Christian-Albrechts University (CAU) of Kiel. It comprises professional archaeologists as well as archaeology students, of whom the majority are certified scientific divers.

The maritime or limnic natural environment of Schleswig-Holstein is shaped by a coastline of 1190 km facing both seas, ca. 300 fresh water lakes and 21.700 km of fluvial waters. These waters were used as source for food, as transport system and as topographical boundary, yet they were similarly a source of danger for the population in past times. Apart from the main task of topographical documentation, AMLA is also concerned with adequate teaching and public awareness in underwater archaeology. In order to achieve these objectives, AMLA cooperates closely with several other institutions, i.e. the State Department of Archaeology of Schleswig-Holstein, the State Museum of Archaeology of Schleswig-Holstein, the Leibniz Institute for Oceanography IFM-GEOMAR, the Scientific Dive Centre of the CAU University of Kiel and the Association for the Promotion of the Institute for Prehistory (FUFG e.V.), to which AMLA is affiliated.

The speakers will present a short overview of shipwreck research in Schleswig-Holstein in previous years. Particular emphasis will be put on an early 16th century wreck off the island of Fehmarn in the Baltic Sea.

[* Research Group for Maritime and Limnic Archaeology]





O. Höckmann

Dr. Olaf Höckmann

Deutsche Gesellschaft zur Förderung der
Unterwasserarchäologie (DEGUWA)



Rhenus Romanus – the Roman Rhine

The presentation reviews Roman nautical history in the Rhineland. It started in c. BC 16 when Augustus decided to submit the “*Free Germans*“ raiding the Roman sphere of interest, to Roman control. Both Roman base camps were installed opposite the mouths of major rivers leading into the opponents’ land (Mainz= *r. Main*; Xanten= *then r. Lippe*), showing that transportation by boat even extending to coasting on the North Sea for reaching the *r. Ems*, was crucial in Roman strategy. A special “*Germanic Fleet*“ based at Cologne protected the river border. Due to this situation, military aspects kept prominent in Rhine navigation even after Tiberius’ decision to stop further offensives.

When the Romans in the later 1st cent. AD occupied wide territories beyond the river for their Empire, it became a peaceful artery for trade. Things changed c.256 AD when the land *limes* collapsed, making the Rhine the contested frontline. The Romans reacted by introducing from Egypt a new river warship, the *lusoria*, and organising a chain of small base camps for them. The strategy worked until 406 AD. After that, only civilian craft as prams, dugouts, and *nachen* survived.





M.-P. Jézégou

Marie-Pierre Jézégou

Département des Recherches Archéologiques Subaquatiques
et Sous-Marines (DRASSM)



The wreck of *Conque des Salins* near Mèze (Etang de Thau, 34)

A vessel's hull fragment of a length of 7.7 metres and maximum width of 2.2 metres was discovered in the lagoon of Thau near Mèze (Hérault), ca. 80 metres off the coast, in a depth of less than a meter. This fragment is composed of ten strakes and four frames, whilst the fifth frame is only indicated by traces visible on the shell. The inner part of the hull is caulked between the frames with abundant amounts of pitch. The plank assemblage is held together by means of tenons being dowelled into mortises and hence assigns this wreck to a Greco-Roman construction. There is no indication for cargo. Due to the lack of objects, which would facilitate a more precise dating, a sample was dated with the C14 method: It yielded a date for a period from B.C. 280 to 70 A.D., with an increased probability for a period between B.C. 210 to B.C. 85. This vessel resembles a barge with a flat keel and a sharp turn of the bilge, which was used for commodity transport over the lake and possible to unload ships in deeper waters, which anchored farther off the coast. It manifests the relevant characteristics of Mediterranean naval architecture in Antiquity, yet it incorporates also some dissimilar features, like the lack of cross beams to support the frames, a massive mast-step that is orthogonal to the keel, as well as the lack of stringers.





Toby Jones

Newport Medieval Ship
Newport City Council



T. Jones

Digital Recording and Analysis of the Newport Medieval Ship

The following paper discusses the discovery, excavation, and digital recording of a large 15th century clinker-built merchant vessel discovered in the United Kingdom in 2002. The ship appears to have been brought into Newport, Wales for repairs circa 1469, and abandoned soon thereafter. Elements of 64 joggled frame sets and 50 strakes of planking have been identified, as well as a massive mast step/keelson feature, all made from oak. Small finds, including coins and ceramics suggest economic links with the Iberian Peninsula.

Given the vessel's size and condition, advanced methods of recording the ship timbers were investigated. The number and size of the timbers made the utilisation of digital documentation technology a viable, efficient and indeed, preferred option. The ship timbers are currently being recorded using a FaroArm three dimensional digitiser, and Rhinoceros software. The documentation techniques are based on those developed by the Viking Ship Museum in Roskilde, and represent a continual refinement and evolution in recording standards. This paper will detail the current state of research, including a discussion of the advantages and limitations of current three dimensional digital recording technology. The future direction of the study will also be explored, including manipulation of the three dimensional records.





J. Leidwanger

Justin Leidwanger

Department of the History of Art
University of Pennsylvania



Archaeology and Data Management in the Surf Zone: On the Recovery and Interpretation of Cultural Material in Near Shore Waters

Better preservation has traditionally placed the primary focus of systematic archaeological investigation on wrecks at moderate diving depths. Many stretches of the Mediterranean coastline, however, are quite shallow, leaving shipwrecks and other cultural material subject to strong wave energy and environmental disturbance over the centuries. Due to their scattered state, these sites are often overlooked, despite their potential still to reveal patterns of ancient economic practice and cultural interaction. In certain places like Cyprus, where the coasts are almost invariably shallow, it is precisely this type of site that may provide the only viable option at present for investigating the area's maritime history. Archaeology in shallow coastal waters, though, presents a range of other problems of data recovery, management and interpretation. For instance, the challenges are particularly acute in recording and studying the incoherent cultural material often encountered by divers close to shore on reefs and in natural inlets. By integrating the shallow finds from one area of southern Cyprus into a Geographic Information System (GIS), the present work seeks to examine the degree to which these sorts of poorly preserved sites can cumulatively shed light on an understanding of broader patterns of coastal use and economic exchange during antiquity.





Prof. Dr. Nili Liphshitz

Botanical Laboratories, Institute of Archaeology
Tel Aviv University



N. Liphshitz

Kyrenia and Ma'agan Mikhael Shipwrecks: A Comparative Dendroarchaeological Study

The Kyrenia and Ma'agan Mikhael shipwrecks resemble in many aspects. Both were built in a similar period: the Kyrenia -- around 300 BC and the Ma'agan Mikhael -- around 400 BC. Both were small merchant vessels, 12-15 m long, built using the shell-first method. The hull was constructed using the "mortise-and-tenon" method, and in both copper nails were used. Large parts of the hull of each of the vessels were preserved, recovered and conserved in PEG. Comprehensive dendroarchaeological studies have been carried out recently for both shipwrecks. Wood samples from the hull construction timbers were taken for botanical examination: 218 samples represented the Kyrenia and 98 samples represented the Ma'agan Mikhael. Identification was made microscopically up to the species level. The Kyrenia was mainly built of *Pinus brutia* (Calabrian pine): 92% of the hull construction timbers, 82% of the supplementary hull construction timbers and 55% of the other UM hull timbers were made of this tree species. *Quercus cerris* (Turkey oak) and *Quercus coccifera* (Holly oak) were used for tenons and pegs. The Ma'agan Mikhael was also mainly built with *Pinus brutia* and 74% of the hull construction timbers were made of this tree species. About 21% of the wood originated of *Quercus coccifera*, which was used for tenons, pegs and trenails (Liphshitz, 2004). Both vessels were built with very similar tree species. Comparison of the native distribution area of these trees in the world and in Turkey (Davis 1965-82) leads to the assumption that both ships were built in the same area: in west -- northwest Turkey.





Y. Morozova

Yana Morozova

Center for Underwater Archaeology
Taras Shevchenko Kiev National University



Underwater archaeological explorations and excavations on the shelf of the Black Sea (the Crimean Peninsula, Ukraine)

The large-scale underwater archaeological investigations of the northern Black Sea region began in the fifties when the famous archaeologist V. Blavatsky carried out for the first time a systematic underwater survey. Since then, nearly twenty wrecksites (without exception from the ancient and medieval periods) have been discovered, but only two of them became subject to full-scale archaeological excavations. The first one was found in 1964 in the area of Evpatoria (off the western Crimean shore). It was an ancient vessel of the 4th -3rd century B.C. loaded with amphorae. The second shipwreck belongs to the medieval period - the 13th century. The wreck was found in the Bay of Sudak (the south-eastern part of the Crimea), its excavation began in 1999 by a Kiev University team under the direction of Dr. Sergiy Zelenko. In this paper the problem of wrecksite identification in shallow water is discussed and indications and attributes of shipwrecks in the Black Sea are exemplified.





I.R. Rossi

Irena Radic Rossi

Croatian Conservation Institute



HRVATSKI
RESTAURATORSKI
ZAVOD

In situ protection of the underwater cultural heritage in Croatia

Some recently discovered non-looted underwater archaeological sites in Croatian waters have been preserved by the installation of protective iron cages. The main reasons for this choice were the lack of adequate store rooms for a huge quantity of amphorae and the nice appearance of the sites on the seabed. During last ten years the protective cages have been placed over 7 Roman sites, mainly shipwrecks, dating back to the period from the 2nd cent. BC to the 4th cent. AD. All of them are accessible to experts and amateur divers and provided by an entrance permitting the archaeologists to control the situation or examine the sunken objects. Although not a nice solution from the aesthetic point of view, the Croatian underwater iron cages represent quite a good temporary solution in terms of preserving underwater heritage for future research.





D. Sakellariou

Dr. Dimitris Sakellariou, P. Georgiou, V. Kapsimalis, G. Rousakis

Institute of Oceanography
Hellenic Centre for Marine Research



**D. Kourkoumelis, P. Micha, T. Theodoulou,
D. Evagelistis, K. Dellaporta**

Ephorate for Underwater Antiquities
Hellenic Ministry of Culture



Integration of sub-bottom profiling and side scan sonar data in deep water archaeological research: the discovery of two ancient wrecks in the Aegean Sea.

More than 20 research cruises devoted to deep water archaeological investigations in the Aegean Sea have been carried out during the last six years within the framework of a long term collaboration between the Hellenic Centre for Marine Research and the Greek Ephorate of Underwater Antiquities. The experience on the application of a marine geological-geophysical methodology for deep-water archaeological research, gained on these cruises, allows a review of their capabilities and limitations. Their use becomes all the more effective, when the principles of oceanography and marine geology are being followed during the interpretation of the geophysical recordings. The integration of sub-bottom profiling data provides valuable information on the geological structure of the seafloor's shallow substrate, which are an almost absolute prerequisite for a geologically reasonable interpretation of the side scan sonar images. Consequently, it allows a better distinction of anthropogenic objects, like ancient shipwrecks, from geological structures, like rocky outcrops. It is this methodology, which was applied during two recent cruises and led to the discovery of two Hellenistic shipwrecks at depths of 70m and 495m, half-buried in the muddy seafloor.





Cpt. Wilfried Stecher

W. Stecher

From the wreck to the ship. Conclusions from the wreck site on circumstances and course of the casualty

Marine casualties are no mono-causal events. They occur within a socio-physical environment. The search for the triggering and accompanying circumstances could not lead to satisfactory results if too narrow an approach is adopted. Foundering of wooden ships have in common that the hull during sinking and some time after is still effecting buoyancy. This is the reason why ships with "light" organic cargoes are nearly unsinkable. Due to this fact only wrecks with a cargo of a density > 1 have been and will be found. An analysis of typical casualty events demonstrates that some of them can nearly completely be excluded for wooden sailing ships, including capsizing in any direction. The most probable course of events is a slow ingress of water after the connecting elements between various members of the hull construction during long periods of sea service have lost their original strength thus temporarily admitting a slow but steady inflow of water through opening shell seams. Starting with minimal quantities this can soon develop to an ingress which cannot be controlled with the very limited pumping or bailing arrangements of ancient ships. Immediately after the beginning of the sinking at first the buoyancy of the hull including the rig will increase. The ship will settle down on even keel. As the surplus of weight forces is only small the ship will sink slowly and settle smoothly on the sea floor. No major damage to the hull will occur. The ports of loading and destination as well as the exact date of the casualty in most cases cannot be deducted from the find with an acceptable degree of reliability. Elementary events such as heavy storms cannot be positively excluded ever to happen during the "safe" period of shipping, as examples of the near past demonstrate. For the wrecks of Mahdia and Madrague de Giens probable course of events will be proposed.





I. Chrysocheri

Harry E. Tzalas & Irene Chrysocheri

Hellenic Institute of Ancient and Mediaeval Alexandrian Studies (HIAMAS)



The Underwater Archaeological Surveys of the Greek Mission in Alexandria, Egypt (1998-2006)

This paper will present the results of 15 underwater archaeological campaigns carried out in Alexandria, Egypt, by the Greek Mission from 1998 to 2006. The Hellenic Institute of Ancient and Mediaeval Alexandrian Studies was granted a concession by the Supreme Council of Antiquities of the Ministry of Culture of Egypt to survey and excavate an area extending east from the boundaries of the Eastern Port of Alexandria. The area has been divided into six sub-sites. The surveys were carried out at different depths, ranging from the shallows to 28 meters, with distances from the coast varying from a few meters to 1000 meters. A multitude of finds were located, photographed, drawn and studied at sub-site Chatby 1. There lie the remains of ancient Cape Lochias, which formed part of the Ptolemaic Royal Quarter, and numerous architectural elements pertaining to different monuments of the Greco-Roman period rest scattered on the seabed. At sub-site Chatby 2 some architectural remains may be attributed to the Martyrdom of St. Mark. At sub-site Ibrahimieh 3 a large number of stone anchors, as well as the lead components of an oversized composite anchor, were raised, restored and studied. At sub-site Ibrahimieh 4 a large stone quarry was found in the shallows while in the shallows of sub-site Sporting 5 the remnants of a large Necropolis were surveyed in a preliminary manner. The El Hassan Reef marks sub-site 6 and the amphorae strewn on the seabed indicate the existence of several shipwrecks. Two further campaigns are planned for spring and autumn 2007.





S. Wachsmann

Prof. Dr. Shelley Wachsmann

Institute for Nautical Archaeology (INA)
Texas A&M University



Deep-Submergence Archaeology: The Final Frontier

A modern myth has ancient mariners hugging coastlines ‘for safety’ when, in fact, the intersection of land and water represents the greatest danger for shipping. The open sea represents relative safety, where a vessel had a good chance of outrunning the weather. The survival rate of ships in open water was always greater than near shore. Ancient shore-based piracy gave further incentive to avoid near-shore sailing. In the Mediterranean and its subsidiary seas, routes crossing open water were well established by the Neolithic period, and in some cases even earlier. Based on studies of records of Lloyds of London dating to the mid-19th century, Willard Bascom, in his book *Deep Water, Ancient Ships* reasonably estimates that up to 20 percent of shipwrecks recorded in the documents did so in open water. As Bascom notes, these percentages should also apply to antiquity. In recent years the development of remote-operated vehicles (ROVs) and autonomous underwater vehicles (AUVs) has opened the deep-sea floor to nautical archaeology. Problems remain, however, regarding legal-scientific issues raised by deep-water shipwrecks in international waters where no laws protect them. Treasure-hunting efforts to recover shipwrecks of economic value may be expected to proliferate.



Postershow:

**Dr. José Bettencourt, Dr. Patrícia Carvalho,
Dr. Cristóvão Fonseca**

Centro de História de Além-Mar (CHAM), Faculdade de
Ciências Sociais e Humanas, Universidade Nova de Lisboa



Project PIAS -- preliminary report of a maritime archaeological study of shipwrecks in Angra bay (Azores, Portugal)

The Portuguese and Spanish maritime voyages of the 15th and 16th centuries have revealed early the strategic value of the Azores for Atlantic navigation. In fact, passing ships on their way to Europe were forced by the prevailing winds of the Atlantic to approach the Azores, where supplies were loaded and course corrections made. In this period, the Angra bay on Terceira Island, has been the most important oceanic haven. Although this natural anchorage was sheltered from the prevailing winds, the bay was not sheltered from southerly and southwesterly winds, which frequently caused ship catastrophes, as is well reflected in 16th and 17th century written sources. On this poster we present the preliminary results of the archaeological survey carried out by CHAM as part of the PIAS project (study of the shipwreck sites Angra A, B, D, E and F). Our field work has revealed that portions of hulls are still preserved, protected on a very dynamic area by the ballast and a thin layer of sand, and scattered artefacts. The preliminary observation and study of shipbuilding techniques indicates a preponderance of Iberian ships from the 16th and 17th centuries, although wrecks from the 19th century are also present.



Postershow:

A. Mallios¹, D. Sakellariou¹, K. Dellaporta², B. Foley³, R. Camilli³, D. Kourkoumelis², P. Micha², D. Evagelistis², Th. Theodoulou², C. Smith¹, E. Kallergis¹, L. Manousakis¹, Katsaros¹.

1 = Hellenic Centre for Marine Research

2 = Ephorate of Underwater Antiquities, Hellenic Ministry of Culture

3 = Woods Hole Oceanographic Institution

HCMR contribution to deep-water archaeology in Greece

With the operational use of advanced underwater platforms, the Hellenic Centre for Marine Research has undertaken a major supporting role on deep-water archaeology in Greece. Since 2000 up to 20 cruises have been carried out in collaboration with the Greek Ephorate for Underwater Antiquities and international archaeological institutions. Along with SCUBA and surface supplied diving systems, the Centre operates a 2-man submersible and three ROV systems extending the boundaries of depth and time research and has also supported AUV mapping projects of archaeological sites. The submersible "Thetis" (610m max depth) is able to put an observer archaeologist onto the scene with excellent field of vision, typically with 4 hour dive duration. The implementation of state-of-the-art navigation and scientific sensors (eg. Gemini *in-situ* mass spectrometer) enables precise measurements and detection of wrecks geochemical signatures. The ROVs are used in either search mode undertaking video and sonar transects, target identification or supporting the Thetis allowing archaeologists on the ship to observe and interact in real time. The systems and techniques undergo continuous development. Developments in amphora handling, survey methodology, submersible vehicle positioning and the implementation of new technologies will allow a better mapping and characterization of the deep-water archaeological sites.



The conference proceedings will be released in a forthcoming SKYLLIS issue, which is published by the German Society for the Promotion of Underwater Archaeology (DEGUWA).

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