



Themata 5 E-learning Archaeology, the Heritage Handbook





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E-learning Archaeology

the Heritage Handbook

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Maritime archaeology

by Andrzej Pydyn

→ **LU** Maritime archaeology – Introduction
by Andrzej Pydyn

sco Introduction

Maritime archaeology is a thriving branch of archaeology, despite not being clearly delineated in its scope and definition. The most commonly found definition considers maritime archaeology to be a science that focuses mainly on the relationship between the individual/society and the sea, or as one researching all aspects of human activity in relation to the sea and coastal line. This definition encompasses issues connected with the Pleistocene exploitation of the marine environment, as well as evidencing and preserving ship-wrecks from World War II. Even the archaeology of lakes and rivers is understood to be 'maritime' according to this definition. Prehistoric and medieval seaside settlements can also be of interest to maritime archaeologists, even though these issues are more closely tied to settlement and wetland archaeology.

sco Maritime archaeology and underwater archaeology

A considerable number of human activity remains in the maritime zone, can be found under the water surface; hence maritime archaeology is often equated with underwater archaeology. It is however important to remember that the term 'underwater archaeology' is merely the name of a concrete research method. As such, it can be tied to multiple issues such as the submerged Mesolithic Ertebølle-culture settlements, traces of Native American activity found in flooded Yucatan caves, Neolithic, Bronze and Iron Age seaside settlements, Medieval bridges, submerged ports and cities, as well as ship-wrecks from different time periods.

For many researchers, maritime archaeology is mainly the archaeology of vessels and ships. This was the opinion of Seán McGrail (1987), reflected in his research and publications. It has also influenced the above diagram, which is often used as the starting point for debates on the definition and scope of maritime archaeology. For McGrail, studying rafts, boats, ships and other related to them topics is the basis of maritime archaeology. I do not intend to undermine the importance of such studies for researching maritime aspects of the past

culture; nevertheless it is crucial to be aware of the fact, that such analyses are only meaningful when contextualized more broadly. After all, maritime history does not consist only of the evolution of simple boats into more complex ones.

sco Keith Muckelroy – maritime, nautical and underwater archaeology

The basis for a more in-depth approach to the problem of the scope and definition of maritime archeology was Keith Muckelroy's pioneer work *Maritime Archaeology* (1978). Apart from his achievements in the field of improving and populating underwater and maritime archaeology, he saw the need to strengthen and develop the theoretical and methodological framework of this new branch of archaeology. Such reflections are just as important now as they were in the 70s of the 20th century; especially that maritime archaeology, with its underwater excavations in particular, is viewed as a 'treasure hunting', both by academic circles and the public opinion.

Muckelroy's work has become the basis for the further development of theoretical and methodological frameworks in maritime archaeology and allowed defining the relationship between this discipline and other branches in archaeology as well as with other sciences. Since the time when his work was published, maritime archaeology has 'come out from underwater' to a much bigger extent than anticipated even by Muckelroy himself. Vessels and boatbuilding have become only one amongst many of maritime archaeology spheres of interest. Contemporary maritime archaeology encompasses issues such as the society, economy and culture of past communities, also those not directly reflected in archeological findings (as exchange, trade, social structures, beliefs etc.).

> **Animation** showing diagram and following text

In the above diagram, Muckelroy defined the relationship between three branches of archaeology: maritime, nautical and underwater. It is important to point out that the researcher understood nautical archaeology as the study of vessels and ships. Maritime archaeology, the main interest of Muckelroy, is marked on the diagram with a double circle. The field in the oval is nautical archaeology, which includes categories A, B and D. According to the author, the consecutive fields are:

- A nautical heritage (vessels and their equipment) found outside of the nautical context (e.g. vessels found in graves), deliberately placed there;
- B nautical heritage not found in water (e.g. ones left on beaches);
- C other monuments related to maritime (but not nautical) archaeology, found outside of the marine environment (e.g. on drained areas);



D marine construction and technology (especially boat-building) researched using underwater archaeology;
 E other aspects of maritime archaeology researched under water, not being a part of nautical archaeology;
 F underwater archaeology in a non-marine environment (mainly sites being under water as a result of a change in water levels).

- > sco Exercise
- > sco Exercise
- > sco Exercise

→ LU Types of maritime heritage by Andrzej Pydyn

sco Submerged Prehistoric Archaeology and Landscapes of the Continental Shelf

Generally speaking, when people hear of marine cultural heritage, historic ship-wrecks are the first thing that comes to their mind. It is however important to be aware of the fact that there exist many types of this kind of heritage. When it comes to research potential, almost the whole continental shelf should be considered archaeologically interesting. Almost 90% of the Pleistocene and early Holocene coastline is currently under water, the regressions and transgressions of waters in this period of time have reached more than 100 km. This meant that many shallow water reservoirs completely changed their shape or even ceased to exist, the coastline kept shifting, while islands disappeared and reappeared again. Submerged sites from the Stone Age can be found in Turkey, Israel, Cyprus, France, Denmark, Germany and Sweden. Without the research carried out in the Tybrind Vig site and many others in Denmark and Northern Germany, our knowledge about the Mesolithic would have been considerably poorer. A great number of valuable organic monuments that have been found there, proved to be very helpful in interpreting the Stone Age. The EU research project – Submerged Prehistoric Archaeology and Landscapes of the Continental Shelf – looks very promis-

ing and it is predicted that it will considerably increase our knowledge in this field.

sco The maritime cultural landscape

The submerged archaeological sites cannot be analyzed without looking at a broader archaeological context. This is also due to the fact that the traces of human activity found in the marine environment are often caused by the development and use of the coastal zone. That is why an important element of cultural heritage is the so-called maritime cultural landscape. Such landscape was formed by prehistoric, medieval and even modern societies. Learning about and preserving maritime cultural landscapes, constitutes one of the most important aspects of maritime archaeology.

> Animation showing the following text

As mentioned above, boats, vessels, ships or their remains are usually associated with maritime cultural heritage. This is not surprising knowing that the Vasa museum in Stockholm, just as the Mary Rose museum in Great Britain, are amongst the most frequently visited museums in their countries. The same applies to almost all maritime archaeology museums. The archaeology of late-Medieval and Modern boats and ships is often closely tied to the national history of many countries, hence its popularity. Unfortunately, many exploration expeditions in the 16th, 17th and 18th centuries were fuelled not by scientific interests, but by wanting to gain access to the cargo.

Very rich sources of information are ship-wrecks from an earlier time period than late-Medieval times and modernity. Finding the wrecks of Gelidonya and Uluburun have significantly changed our understanding of the Bronze Age in the Mediterranean. Theoretical assumptions about trade, exchange and long-distance contact have been proved reasonable thanks to the cargo found on these ships. Apart from 10 ton of copper and 1 ton of tin, the Uluburun wreck concealed many objects from geographically distant areas, such as Baltic amber and African ebony.

A large amount of Roman ship-wrecks were found in the Mediterranean. Hence, maritime archaeology should not only focus on excavating and describing the found cargo. Archaeology understood that way would quickly fill all the empty museum storerooms. Just as important, or even more so, is the reconstruction of potential trade routes and an in-depth interpretation of all aspects connected to marine activities of the society in question.

Valuable ship-wrecks, from the point of view of cultural heritage, are found not only in Northern Europe and the Mediterranean. This is best illustrated on the example

Figure 1 Divers about to go down



of one of the most important contemporary discoveries – the ship-wreck of the Chinese Tang dynasty. This Arabic-descent unit was transporting everyday use pottery, as well as beautiful gold objects. It sank over 1100 years ago near the Indonesian island of Belitung. This ship-wreck is irrefutable evidence that the marine silk-route existed for many centuries before the appearance of the Portuguese in this region.

sco Ports and harbor-cities

For centuries, ports and harbor-cities were windows to the world for past societies. Their remains are now ‘windows into the past’ for maritime archaeologists. Such excavation sites that are located not only inland, but also under water, constitute a valuable part of cultural heritage. The submerged remains of ports and harbor-cities have ended up under water as a result of a change in sea level, geological subsidence of the coastline or earthquakes. Usually, all of these factors influenced the sinking of ports. As a result, under water, there are many sites from different time periods, providing archaeologists with varied information.

In many regions of the world there exist many submerged and abandoned remains of ports and harbor-cities. They come from different time periods, but can provide us with important information about the everyday life of people, their trade contacts, shipping lanes, boatbuilding and other aspects of marine culture.

> **Animation** showing the following text and words have to be placed in the right position

One of the most well-known ancient ports is port Piræus. ‘The place over the passage’, as you can translate its name, was settled already as early as 3 thousand years BC, its ‘golden era’, however, was the late 6th century BC. That was when all three of the port deep-basins were used. After the fortification works of the first half of the 5th century BC, Piræus became the main naval port of Athens and the place where its power was built. As a result of multiple conflicts, the fortifications of Piræus were often demolished and rebuilt again. Nevertheless, the damages done by Sulla in the year 86 BC, were big enough for the port to diminish in meaning. Since 2002 two deep-basins of Zea and Mounich are of interest to archaeologists studying them both on land and under water.

Important ancient port cities are also Alexandria and Heraklion, as well as Canopus in the region of the Aboukir gulf. Not only many monuments and ship-wrecks were found there, but also whole regions of cities dated back to the Pharaoh, Hellenic and Roman times. It is believed that a series of earthquakes and tsunami waves contributed to

the flooding of these regions, which are currently available only to the scrutiny of maritime archaeologists.

A completely different set of information is provided by the submerged city of Port Royal, Jamaica. This place has been the headquarters of pirates, smugglers and fugitives, until it was destroyed in 1692 as a result of an earthquake and tsunami wave. Archaeological excavations led there since the 80s of the 20th century, resulted in obtaining many monuments, amongst them organic objects, which enabled understanding many aspects of 16th and 17th century British-colony life. Works carried out on this site also allowed the reconstruction of the way that the submerged city looked like.

One of the most interesting contemporary marine excavation sites is Yenikapi in Istanbul, where the remains of Theodosius I’s trading port were unearthed. This port functioned between the 5th and 15th centuries AD. During the railway-building works under the Bosphorus strait, 34 shipwrecks dated for the 6th and 11th century were found. Most of the wrecks found are remains of trade-ships. One of the most interesting finds is a type of a row-boat, which is probably the first archaeological example of a Byzantine galley.

sco Treasures

Many of the monuments found in the marine and generally water environment are ones that can be named ‘treasures’. These are usually objects deliberately placed under water. It seems highly probable that a large amount of such deposits was symbolic in character and represented a form of a pot-latch. Treasures of this type were deposited in late prehistory, in the Bronze Age and early Iron Age. Most of these finds come from lakes and rivers, not from the marine environment per se.

The widespread understanding of ‘treasures’ considers them to be rich deposits made from precious metals, found in submerged ship-wrecks. Unfortunately, such conceptualization suggests some controversial methods of acquiring such treasures. One of such findings is the ship-wreck *Black Swan*. It has been found in 2007 in the Atlantic Ocean and was filled with around 17 ton of silver coins, hundreds of gold coins and other precious-metal objects. The value of the findings was estimated to be around 500 thousand million dollars. The wreck was discovered by the firm Odyssey Marine Exploration, which looks for treasures commercially. Before informing anyone about the findings, the ‘treasures’ were transported to the US, which made it difficult for the Spanish government to claim it. Spain stated that the *Black Swan* is the *Nuestra Señora de las Mercedes*, which sank in 1804. This unit was equipped in

36 cannons and sank near Portugal during a sea battle with the British naval force. According to the international law, all military units indefinitely remain under the jurisdiction of the countries, which they served. It is important to mention that transporting the treasures found in the *Black Swan* to the us, raises many legal and scientific reservations.

> sCO Exercise

→ **LU** Archaeological maritime techniques by Andrzej Pydyn

sCO Research of archive

Both systematic exploration and searching for underwater sites should be preceded by an archive query if possible. This is relevant especially when it comes to sites from well-documented historical periods. Archives, libraries, records from parish books, transport companies, lighthouses etc. can be a valuable source of information about sunken ships. Monuments and tombstones can in turn tell us a lot about past sea tragedies. Contemporary and archival maps show the existing navigation obstacles. Models and drawings can help in visually reconstructing the units under study. Shallow water basins can be analyzed using aerial photographs. Names of towns and villages can cast a shadow at past events, while oral stories tend to be kept alive for centuries by the local communities. Very important sources of information are fishermen whose nets get tangled up in ship-wrecks. Especially sponge fishermen tend to have a broad knowledge about the whereabouts of wrecks. An in-depth analysis of the available information about the site is the key to a successful expedition.

sCO Invasive and non-invasive archaeological research

Archaeological research carried out under water, just as inland, can be divided into invasive and non-invasive. The latter is made up of works that lead to finding potential sites and those, which aim at documenting them. At the same time, it is important to mention that many documenting methods will be used not only during the excavations, but also before they actually take place.

Despite the fact that many underwater sites are found by accident or during large hydro-engineering investments, increasingly often systematic explorations are carried out, which aim at finding new sites. They are also helpful in documenting findings that are under water. Such work is the basis for a well-planned research strategy and helps in the professional management of cultural marine heritage. Depending on the size, depth and other characteristics of the water basin in question, research can be carried out using

various methods.

> **Animation** showing following text

The easiest one is using divers to penetrate the area of interest. This method is similar to the ones used on land, such as for field walking. The most difficult in such explorations is managing the area under study. This requires establishing methods, thanks to which controlling the area of interest and deciding if there is a need for further work in the same place or not. In comparison to excavations in the open air, working under water is more difficult due to water transparency or clarity. In small water basins, divers can carry out their search by moving parallel to the coastline and keeping a constant depth.

In order to maintain an equal distance between individuals, a string, held by all of the participants, is used. In underwater prospecting, the so-called corridor or circle method is used.

More detailed searches require using the research axis or incandescent grid. The major limitation of the above methods is the fact that they are time-consuming and possible to implement only on a small area. A partial answer to these problems is using underwater scooters or pulling the diver with a swimming unit, moving at a low speed.

Increasingly, metal detectors are being used in underwater searches. They are particularly useful when penetrating areas with a big layer of sedimentation, which conceals archaeological remains. Such technology aids in precise localization of metal objects covered with concretions. It is important to remember that this is only one of the tools used by underwater archaeologists. All findings gained this way require detailed documentation, which takes into consideration not only the object itself, but also the site where it comes from.

Searches carried out in large areas require using different methods, which allow gaining information about the site without having to dive under water. Modern technology equips us with many useful tools that enable this. Geophysical methods have been used in archaeology since the 1960s. They are useful not only in finding sites, but also in making their blueprints and uncovering the site-formation processes. This in turn helps in the more efficient management of underwater archaeological heritage and their better conservation. Geophysical research allows not only enlarging the scope of the excavation, but also carrying it out in deep-water basins, which are difficult to reach by divers. It also provides researchers with information about objects fully hidden beneath the seabed.

Generally speaking, two types of geophysical tools can be



distinguished, which are used in maritime archaeology. The first category consists of tools using the acoustic method. This includes echo-sounders, multibeam swath systems, sidescan sonars, sub-bottom profilers, bottom classification systems. The second types of tools are magnetometers measuring disturbances in the magnetic field. They allow finding large metal objects, as well as furnaces and ceramics clusters.

sco Using the Appropriate tool

Using the appropriate tool will depend on many factors. The most important ones are: the type of the seabed, the size of the area of interest, the amount of detail needed in the research process (both in qualitative and quantitative research), type, size and location of the objects. Contemporarily, so-called integrated surveys are being carried out increasingly often. They use two or more of the tools mentioned above and the data acquired that way is analyzed together to get a fuller picture of the situation.

> *Animation showing the following text*

An example of an integrated system is also ROV (remotely operated vehicles) and AUV (autonomous underwater vehicles). These tools gather large amounts of acoustic and photographic data, show a current image of the seabed and can perform certain tasks, which earlier had to be done by divers. At the same time they are not limited by time and depth. Initially, they could operate at a depth of 300 m, but their modern version works at a depth up to 6000 m. It was using ROV that Robert Ballard found the Titanic, but from an archaeological point of view more valuable are his projects realized in the Black Sea, near to the city of Sinop. A couple of ancient shipwrecks were found there at a depth of 100 m. The most spectacular find is Sinop D, located at a depth of 320 m, in anaerobic waters – a perfect conservation environment. This ship-wreck is dated back to the turn of the 5th century AD and has a well-preserved hull, cargo, deck and even the mast. Such projects have also been

realized by Marek Jasinski from the Norwegian University of Science and Technology in Trondheim. He studied ship-wrecks found in the Northern Sea during the building of gas and oil pipes, as well as searched for submerged wrecks in the region of Ithaca in collaboration with Greek archaeologists.

The primary step for archaeological works is determining the geographical coordinates and level of elevation of the site. This is relevant also when it comes to underwater excavations. Unfortunately, defining this under water is a very difficult and complex task, hence it is usually performed from the water surface. In order to determine the geographical position, one can use fixed reference points found in the surrounding landscape. Such points are also useful when it comes to the later drawing of the area in question.

The more detailed horizontal sextant angles can be found using the theodolite. Archaeological works are also facilitated by tools such as GPS and total stations, which allow localizing chosen points in three dimensions. The relative difference in height can also be measured from underwater markers, research axes and grids. The leveler proves to be very useful in works carried out in shallow water-basins.

With a stable water level and small waves, height measurements can be exchanged for depth measurements.

Since the Mary Rose excavations in 1972, underwater archaeology uses the acoustic positioning system (APS). This tool uses ultrasonic waves to locate divers or ROVs, which helps in making blueprints of large areas. The main drawback for using this method is its high cost.

sco Correct documentation, digital photography and filming

> *Animation*

Showing the following text

The most time-consuming and labor intensive element of underwater excavations is their correct documentation. Even during the first stages of the excavation process, various sketches and drawings, even if they are vague, are very useful. A more detailed image-documentation is mainly made up of plans and, if possible, profiles. In order to document the site, one needs permanent checkpoints, from which all measurements will be taken. It is also a good idea to use research axis that define the directions and sometimes even the level. They are sometimes replaced by frames or measuring grids. Larger sites require incandescent grids, which should be tied to a geographic grid.

Figure 2 A shipwreck partly covered by sand

The development of digital photography and filming made documenting excavations considerably easier. Photographs are an important addition to drawings. They are also very helpful in making plans. Also monuments are documented by photographing them after they are taken out of water. When taking photos in water, it is important to remember that it requires special equipment and lighting.

sco Invasive methods in underwater archaeology

Archaeology also uses invasive methods. The full history of most sites can be uncovered only after exploring them as wholes.

> Animation showing the following text

The most characteristic tools used in underwater archaeology are ejectors, which work like vacuum cleaners, taking in all of the sand, dirt and other sediments. This tool works as a result of pressure difference that arises in a narrow tube during the flow of water or air. Depending on the needs, ejectors can be used both in small-scale and large excavations. Water ejectors are most often used in excavations carried out in shallow water-basins because air ejectors would not create the necessary under pressure. On some of the sites, exploration works are carried out by probing, which allows determining their lower density and size. Probing can be realized by using a scaled rod or a water or air pump. This method is mainly used to determine the scope of submerged structures or ports. It is important to point out that probing is dangerous for unseen objects, which are beneath the seabed. Most tools used in underwater archaeology are ones known from ordinary excavations: trowels, brushes and dental tools. Another difficulty is safely transporting the found objects to the surface. This requires using special containers that provide the objects with the necessary conditions and stability. Large objects are pulled out of the water by special flotation balloons. Another of the invasive methods used by underwater archaeology is collecting all types of samples in the underwater sites. Natural sciences are sometimes the key informants when it comes to providing information about the objects under study. For this reason, collecting all types of samples, be they dendrochronological, palynological, botanical or C14, is the basic procedure in all excavations. Underwater sites are also characterized by a low access to oxygen, which preserves the found objects in good shape.

> sco Exercise

→ LU Monitoring, protection and management of maritime heritage by Andrzej Pydyn

sco Monitoring of maritime heritage

The monitoring of underwater archeological sites is closely linked with the management of maritime heritage and thus has to cooperate with the rules that this kind of heritage is subjected to by local and national institutions. The monitoring can be either long- or short term, depending on the characteristics of the site and the aim of the research. Whilst monitoring the underwater sites one should attempt to learn about the processes which have formed and influenced the heritage. This knowledge will be helpful during the management of not only these site but also during the work with other similar sites.

> Animation showing the following text

Careful monitoring should allow one to observe changes concerning the site as well as its surrounding. Such changes can be natural and very gentle or they can be rapid and occur as a result of human interference or due to changes in the natural environment.

The results of the monitoring should allow one to evaluate the risk of destroying the site and thus one can undertake certain steps to protect it sufficiently through the work of a conservator (by the means of documentary work, conservatory actions or rescue excavations).

Even though monitoring seems to be an obvious action, not all sites are systematically looked at. The choice of sites which will be monitored will be dependent upon many factors such as the historical and national value, the risk of damage and the available means.

Single monuments, sites or groups of them or certain aquatic landscapes can be monitored. An interesting project concerning the supervision of chosen monuments has been undertaken by the NAS (Nautical Archeological Society) in the Great Britain. It was called 'Adopt a Wreck' and it encouraged local diving clubs to supervise certain wrecks. Of course the project also involved a necessary archaeological training.

The range of tasks realized while monitoring the underwater sites can vary depending on the aim of the project and available sources. One of the most common actions undertaken during such projects is analyzing whether the aquatic environment suffers from human interference through for example treasure hunt or by typical recreational divers. Also hydro – engineering work (such as pipes) or other digging activities can have an influence on the

aquatic environment. In order to notice the changes, the sites must be monitored regularly.

An important feature of the monitoring of archeological aquatic sites is the standardized archiving of the data, which enables one to easily conclude about the history of the site. Such data systems should be organized by national institutions which deal with archeological heritage.

sco Protection of maritime heritage

As a result of monitoring, one can conclude that a specific site requests actions which would prevent it from further degradation. In this case the in situ protection, which is reasonably new for maritime archeology, must be used. The need to protect archeological monument placed under water appears when they are subjected to many unfavorable conditions. Many objects, such as big wreck pieces, are too big to be excavated and must be left underwater. Of course the decision concerning the excavation must be made by a heritage officer and depends on available resources.

> Exercise

sco Management of maritime heritage

In the last a couple of years, the terms 'archeological management' of 'heritage management' have become very popular. The way and contexts in which they are used is not very consistent.

> **Animation** showing the following text: words need to be filled in

When it comes to maritime heritage management, the most important change which took place over the last a couple of years was changing the approach to the area – oriented approach, from a big emphasis on excavations. Now, the maritime heritage management is focused on research, archiving, monitoring, protection, conservatory work, and dissemination the maritime heritage on the regional and national level.

A conscious archeological heritage management should additionally consider work on the regulations and adjusting them to the present situation. On a national level the law concerning maritime heritage management should be

clearly stated, it should be adjusted to the present economic situation, so that it could be enforced.

An important element in maritime heritage management is education. This would ease the protection of those monuments. Also the maritime heritage can be a stimulating factor in the sustainable development of a region. It is also important to remember that maritime heritage is not only wrecks and drowned archeological sites, but also archival documents, lighthouses, the docks, harbour cities, local sailing traditions, the specific fauna and flora as well as legends.

It is also important to put a lot of effort in combining the protection of the heritage with sharing it among people. This should be an element of long lasting and well designed policy.

→ **LU** Legal framework in maritime archaeology by Andrzej Pydyn

sco Five different areas in the World's aquifers

The legal system created to protect maritime heritage is not consistent or easy to understand. What is more, it differs depending on the country, only in Greece, France and Holland are there specific regulations concerning this kind of archeological heritage. In most cases the maritime archeological heritage undergoes the same regulations as wrecks and other estate present underwater, those regulations are called the Salvage Law. Also the general regulations concerning heritage applies to underwater monuments.

The situation is even more complicated, as the type of the water that the site is located is to change the legal regulations. The United Nations Convention on the Law of the Sea (UNCLOS) from 1982 has delimited a couple of zones in the world's aquifers. In those times the protection of the maritime heritage was not a priority as thus the rules are not very specific and do not concern it directly. There are five different areas in the World's aquifers:

> **Animation** showing the following text

Deep sea-bed and the high seas is an area which is not under the jurisdiction of national laws. Nevertheless the 149th article of the convention is as follows: 'all objects of

an archaeological and historical nature found in the Area shall be preserved or disposed of for the benefit of mankind as a whole, particular regard being paid to the preferential rights of the state or country of origin, or the state of cultural origin, or the state of archaeological and historical origin'. It is clear that this article is far too general to be easily enforced.

The continental shelf is an area which is located between shallow territorial water and the deep oceanic waters. Countries located near the shelf are subjected to the right of exploiting the natural resources on the area 350 water miles from the coast or 100 water miles from the isobaths 2500. Even though the heritage is not defined as a natural resource, the 303rd article of UNCLOS states that a country has 'to protect objects of archaeological and historical nature found at sea and shall co-operate for this purpose'. This statement also is not very specific, but some countries such as Ireland, Norway, Spain, Portugal, the Cyprus, Australia and China have expanded the law for it to directly concern aquamarine heritage located on the continental shelf.

Exclusive economic zone is an area of maximum 200 water miles belonging to the coastal countries, which are given right to exploit the water resources. Still, other countries have the right to fly over, sail through, put cables on the seabed and also perform maritime scientific research on this territory. In these regulations maritime archeology is not clearly stated to be a scientific endeavor, which can cause many complications. Countries like Morocco and Jamaica have expanded this law so that it concerns cultural heritage.

Contiguous zone is an aquifer which borders with territorial waters and thus countries are allowed to enforce their own customs, fiscal, sanitary and emigration regulations. The maximum range of this aquifer is 24 water miles from the coast. The already mentioned 303 article of UNCLOS allows monuments to be treated as if they were located on the territorial waters not in the contiguous zone. Many countries (like the us from 1999) have therefore expanded these regulations to cover maritime heritage to 24 water miles from the coast.

Territorial sea is a zone of maximum 12 water miles, in

which the countries themselves have the right to constitute the laws concerning the aquamarine heritage. In this case, the regulations differ among the countries.

It is also important to remember that citizens of a given country have to obey their own countries law, now matter on which territory they are present.

sco The Salvage Law and National regulations concerning maritime heritage

As mentioned earlier, maritime heritage is a subject to regulations concerning saving and excavating properties from the sea and the ways of proceeding with wrecks (The Salvage Law). National regulations have been partially unified in the convention form 1910, and also supplemented in 1989 (Salvage Convention). The Salvage Law does not control the issues of the ownership of the excavated items of the way in which the wreck should be brought to land. This right also guarantees an enumeration for people who undertake such actions. Some countries like France or Spain have excluded themselves from the regulations of the Salvage Law concerning the maritime heritage.

National regulations concerning maritime heritage are constructed in a very diverse way. In some countries, those regulations are unified with the ones concerning land archeology. Specific countries have other regulations about what items placed under water are considered to be a heritage. In the us and the uk only wrecks placed on a specific lists are protected. In other countries, the age of the wrecks is an indicator of protection. For example in South Africa, the border is 50 years, whereas in Australia it is 75 and in Ireland 100. In Poland, like in many other countries, objects which have an historical or archeological value are placed under protection. The biggest drawback of this method is the problem with the execution of the protection, which is very clearly seen when it comes to maritime heritage.

sco Convention for the Protection of the Underwater Cultural Heritage (UNESCO)

At present, the most spectacular destruction of maritime heritage takes place on the international waters, which happens due to insufficient regulations. An effort to deal with this

drawback has been made by creating in 2001 the UNESCO Convention for the Protection of the Underwater Cultural Heritage, which concerns the protection of maritime heritage on international waters. The main regulations were as follows:

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Countries, which signed this act are obliged to protect cultural heritage as an benefit for the humanity. They are also obliged to be active in issues concerning the protection; maritime heritage will be protected from commercial exploration, the economic market and speculations; the preferred form of protection is the form in situ.

The convention has been implemented in 2009 after being signed by 20 countries. Sadly, many Western countries, which benefit from commercial sailing, still have not signed the convention.

sco The European Convention on the Protection of the Archaeological Heritage

In Europe, an important regulation is the European Convention on the Protection of the Archaeological Heritage from 1992. It was adopted in Malta and is thus called the 'Valletta Convention'. This convention is signed by the majority of European countries. The benefit of this convention is that it is very specific when it comes to defining the archeological maritime and land heritage. Nevertheless it does not take into consideration peculiarities of the aquatic life. Still, the countries which have signed it are obliged to protect their own archeological heritage.

sco Contract work in maritime archaeology

Contract archeology is an issue which causes many controversies not only among archeologists but also among other people. The rules and principles present in this type of archeology have caused many open-ended discussions. For many years maritime archeologists, who worked in cooperation with other institutions, have received contracts and were told to check for obstacles which would cause the destruction of fishing nets or would interfere with cruises. The intensification of exploitation of the coastal area as well as a ascend in knowledge concerning maritime heritage has caused an increase in

demand for contract archeology. Such archeologists always work before or while building new harbours, performing technological changes in the harbours, laying new pipes of cables at the bottom of the sea, building new water dams or excavating materials from the bottom of the see. The development of 'maritime heritage management' as well as an integrated approach to the aquatic cultural environment has caused an increase in demand for contract archeologists.

What differs contract maritime archeology from the typical archeology? When it comes to big projects it is the very small competition on the national level. In some countries this competition is limited by law and other conservation regulations. For example, in Poland the Central Maritime Museum is privileged over other institutions while conducting investigations in the central part of the Polish coast. Also the very high costs of specialized archaeological equipment limits the competition on the market. As the demand for such equipped archaeological groups is still relatively low, not many institutions purchase such apparatus. In some cases, this situation has been used by scientific or strictly archaeological institutions, which from their own resources purchase a part of the expensive equipment, as for them the results of such investigations are most important.

Even in Great Britain, where the contract archaeology exists for a long time and thus has a long tradition, most of the orders are received by Wessex Archaeology, which is a specialized firm and has the necessary human and material resources. English Heritage supports the competition on the market and thus encourages other firms to apply for various maritime archaeological projects. Nonetheless in most cases they are not experienced enough to obtain such a job.

> **sco Exercises**

