

CHALLENGING
THE TAKEN-FOR-GRANTED
IN THE MANAGEMENT OF
UNDERWATER CULTURAL HERITAGE:
ETHICAL AND LEGAL PERSPECTIVES

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Management of cultural heritage depends on ethical decisions. These ethical decisions will bestow the heritage with a value and will protect it by establishing legal frameworks.

However, sometimes, these legal frameworks can have the opposite effect and damage the heritage if they are not continuously revised and updated according to the new ethical challenges of the development in the field of cultural heritage.

Although underwater cultural heritage has a legislative element that protects it from the relatively minor threat of treasure hunters, it pays little attention to ethical concerns that expose the heritage to more serious menaces.

This study proposes (contrary to the traditional view of land heritage management as an example to underwater heritage management) a new vision where underwater cultural heritage challenges principles that in land heritage management have been taken for granted: valuation, use, management and preservation.

The work presents four case studies as models both for illustrating the key ethical issues and for offering solutions: the violin of the *Titanic*, ancient lead for particle physics experiments, watery graves and the effects of climate change on underwater cultural heritage. Finally this work explores themes of value, ethics and the process in which a common object becomes heritage.

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I can no other answer make, but, thanks, and thanks ~William Shakespeare

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Chapter 1

Planning the journey: Introduction

This dissertation is presented as a story. It is the story of the trip made by a galleon called *Heritage* that during the course of her journey is forced into fighting four unexpected battles.

The ship prepares her journey with the hope of a safe trip. There is only one enemy, treasure hunters, that the ship thinks she will encounter but she is ready for it, trusting on the various basic principles of the management of cultural heritage: the *Heritage* has to be valued; the *Heritage* has to be conserved and not used; the *Heritage* has to be respected; and the *Heritage* has to be preserved *in situ*. She has armed herself with the weapons to defeat the enemy under these principles: the *2001 UNESCO Convention on the Protection of the Underwater Cultural Heritage* (or 2001 UNESCO Convention).

However, the ship did not expect four other enemies. Those enemies threaten the *Heritage* with various ethical concerns that challenge those principles previously taken for granted and that were thought to protect the ship until the end of her journey. As a consequence, and since our ship *Heritage* was not ready to defeat those enemies (because they were not even taken into account), *Heritage* is vanquished, sinks and becomes a shipwreck. The bottom of the oceans will be her grave. However, those enemies will not be forgotten and will be taken into account when the shipwreck is managed and preserved for the benefit of humanity.

1.1. The rudder: introduction

Management efforts have mainly been directed to fight against treasure hunters in the protection of underwater cultural heritage.

However, licit unexpected menaces threaten the protection of heritage which can only be solved by establishing ethical debates and updating legal instruments.

In addition, legal mechanisms seem to drive the heritage management process rather than providing support for it. Only by challenging those mechanisms with new ethical discussions will underwater cultural heritage be protected

In the case of underwater cultural heritage, imagination and dramatic mystery compensate for the absence of direct experience (Maarleveld, 2009: 97). On the evening of 11th October 1982 that absence of direct experience changed for the general public: the hull of the shipwreck *Mary Rose* sank in 1545 was raised from the shallow sea-bed near the port and towed into Portsmouth Harbour (Fenwick and Gale, 1998). The shipwreck had previously been carefully studied and analysed and most of her objects on board retrieved and conserved by archaeologists. On the evening of the rising, over 60 million people watched the longest outside broadcast yet undertaken: the *Mary Rose* emerging (Stirland, 2013). The shipwreck, today a museum, can be seen by all: ghost shipwrecks lying at the bottom of the oceans were no longer in need of imagination. The mystery was dispelled.

However, before there was systematic archaeology and long before there was systematic underwater archaeology like the one undertaken by the archaeologists in the *Mary Rose*, there was a respected and lawful but very different cultural attitude to

shipwrecks. This was the idea of salvage: a wreck is a valuable object, to be recovered if it can be, for the treasures it gives up to be sold and for the salvors to be rewarded for their risk-taking and success.

Later, underwater cultural heritage became so valuable for archaeologists and heritage managers for three main reasons:

1. When archaeologists started to research those underwater sites, they realised that they were what has been defined as “unique time capsules” (McKee, 1982) which means that they provide an insight into the past (Hoffmann, 2006) because the remains are preserved often in a perfect condition, due to a protective covering of sediment. Unlike most dry-land sites, wreck-sites are protected against humans and bacteria by the ocean sludge that guards them. As a consequence, we often find materials underwater that on land would have usually disappeared a long time ago: wool, wood, bone, leather or canvas. On land, Pompeii is a famous archaeological example of the rare situation where we have intact vestiges captured and preserved from a single moment in time (Fenwick and Gale, 1998). By contrast, it is common in the case of a shipwreck, that we have examples of some of these materials to study. This is the key reason why shipwrecks are so valuable and therefore their preservation and study such an important piece for heritage managers and archaeologists. The variety of the materials offered to archaeologists and historians provides them with valuable knowledge.
2. In addition, shipwreck sites do not only feature the vessel itself, often a once-magnificent artefact, but also often hold cargo, personal items, tools, utensils, and human remains. This offers a complete picture of past human civilizations.

3. The study of sunken vessels is essential to history because entire continents have been discovered, colonised, invaded and defended by sea: the products of all civilisations have been carried by water.

As an effort to protect such an important source of information, archaeologists and heritage managers have directed their fight against the old attitude of salvage without archaeological record and to mitigate against minor damages, like treasure hunters.

However, this work proves that the real threat is sticking to that old discourse of lost treasures and not to look ahead for future menaces. The prevention of these menaces can only be taken by analysing the facts, creating ethical debates and offering legal solutions. This dissertation adopts an approach to heritage being understood as something that can be formed and negotiated challenging the general assumptions about the “goodness” of heritage (Lixinski, 2015).

This is the main goal of this work and it was chosen for three main reasons:

1. The lack of discussion of the specific dilemma that are analysed. These dilemmas have barely been discussed in the bibliography and in the political, archaeological and heritage management arenas.
2. The amount of risk that this lack of knowledge about the topics presented (which are not isolated cases but risks that are developing) is increasing and expected to be a major menace in the future.
3. The background of the author (history of art, archaeology, heritage management and legal education) that offered the possibility of analysing the topics from various points of view, in order to have a complete picture of the issues and in order to be able to propose recommendations from a blend of disciplines.

1.2. The ship: underwater cultural heritage

The importance of the study and protection of underwater culture heritage is undeniable since a *vast cultural heritage lies beneath the sea* (Smith and Couper, 2003: 25). According to the *2001 UNESCO Convention on the Protection of Underwater Archaeology*, there are archaeological remains of more than 3 million vessels lying in the oceans around the world. There are parts of fleets such as the Spanish Armada of Philip II. There are also historic monuments now under water, such as the Lighthouse of Alexandria or whole cities such as Port Royal, Jamaica; the old Carthage, in North Africa; and the temples of Mahabalipuram and Dwarka in India. In fact, Smith and Couper (2003) state that all the material proof of human activities are evidenced on the sea bed. In addition, new events bring us new underwater cultural heritage. For instance, the underwater cultural heritage protection of World War II will have other kinds of heritage to preserve, such as aircraft carriers containing thousands of planes, helicopters or whole military bases, created before World War I and developed during and after the Second (Ireland, 2010). There will also be all kinds of legacy that those wars have left for us, not only under water but air (aeroplanes, hangers or airfields), land (hospitals or camps), sea (navigation and submarine) or interfaces (ports and harbours).

When it was time to choose a specific topic for this study, I realised that, as Strati (1995) maintained, of all the underwater archaeological sites, wrecks are the most important in terms of their number, volume and variety (they also offer all kind of ethical issues for their condition of mobility and because their nationality is complex and creates ambiguities). In addition, shipwrecks are important not only for the vessel, but also for the cargo (works of art, architectural components, sarcophagi, marble blocks, minerals, amphorae and also mundane things, such as ballast or items carried by crew and

passengers). Likewise, wrecks are not only found at sea but, due to maritime routes or sea battles, they are also left on the beds of rivers. As a consequence, their study would allow me to research all kind of material, objects, situations and circumstances.

In addition, a less scientific reason attracted me to shipwrecks, namely, shipwrecks have always been attractive to me; they are mysterious. Shipwrecks offer a link to everyday people and they have raised stories and films such as *Robinson Crusoe*, *Titanic*, *The Life of Pi*, *Odyssey in ancient Greece* or *Poseidon* to name but a few.

There have been different periods and types of ships and ventures and in almost all of them we have preserved shipwrecks (Pickford, 1994): the Vikings, the Chinese junks, the Levantine trade, the Armada, the Spanish plate fleets, the pirates and privateers, the East Indiamen, the Age of Revolution, the Rush for Gold, the Liners or the World Wars' ships. Unimagined ships have sailed the waters: the *Vrouw Maria*, for instance, was a shipwreck that sank in 1771 with several works of art from a collection in Amsterdam (Pickford, 1994).

As a consequence, all manner of shipwrecks can be found lying on the bottom of the ocean: from battleships (Lorenz, 2010) to passenger ships or cargo ships. Each one of the types has different objects carried aboard depending on the vessel: merchant (cargo), warship (cannon balls), passenger ships (crew, passengers, slaves) or exploration vessels (telescopes, glass), for instance. Some authors state that a ship, in fact, can be a miniature floating city (Pringle, 2013: 802). In addition, each wreck has a story (Smith and Couper, 2003). Maarleveld (2009) defends that the ship, the goods and its complement, have widespread cultural backgrounds and they are linked to different areas and communities and to their exchange.

How a ship becomes a shipwreck is, according to Gibbs and Adams (2001), driven by two motives: (1) catastrophic shipwrecks (that are formed after a crisis event) and (2) intentionally deposited or abandoned (which could be those that have been recycled or transformed). However, how shipwrecks are found is a mystery. Fenwick and Gale (1998) assert that some wrecks have always been known: they can be around harbours or rivers. Some of them are found from the records of ship losses that were made because the ships were of economic importance. Some others would appear on the news or on the naval court-martials. Some of them are captured on paintings by artists and some wrecks are discovered by chance. And some of them appear by remote sensing surveys such as echo sounders and sidescan sonar.

The figures are difficult to calculate. According to the shipwreck registry¹, only in the year 2013 were there more than one hundred ships wrecked around the world. If the amount is multiplied from the first years of navigation thousands of years ago, the number of shipwrecks is unimaginable. According to Keith (2000), a minimum of 9,600 shipwreck sites have been discovered and reported and worldwide 10% of discovered and reported shipwreck sites have been extracted. Gibbins and Adams (2001) state that in the Mediterranean region there are 1,189 shipwrecks catalogued dating before AD 1500. Dromgoole (2004) stated that it is now possible to recover material from 98% of the world's total seabed using current equipment. Consequently, shipwrecks once too deep to reach have become accessible and vulnerable to human interference. The famous *Titanic* is a good example: once lost in the vast depths of the ocean it has now been precisely located and can be routinely reached by modern deep-ocean exploration craft (Dromgoole, 2004).

¹Worldwide Shipwreck Database: International Registry of Sunken Ships. Available at: <http://www.shipwreckregistry.com/index.htm>

O'Keefe and Nafziger (1994) list differences between various kind of underwater cultural heritage associated to shipwrecks: wreck (property loss at sea that may or may not come ashore), derelict (abandoned property at sea), flotsam (property loss at sea but afloat), jetsam (sunken goods thrown overboard to lighten or save a ship) and lagan (buoyed jetsam marked or identified and later recovery). For the purposes of this dissertation, I will refer to all of them as shipwrecks and I will only specify if necessary.

However, what is significant about this dissertation is that shipwrecks are valuable for their status: shipwrecks were vehicles of communications and trade (Gibbins and Adams, 2001) and as a consequence they were influential in the mental ideologies of different cultures. In contrast with land archaeological sites that are more related to a national cultural identity, a ship embodies much greater diversity to the history of many countries and cultures and carries out unique cultural values (Smith and Couper, 2003). As Maarleveld (2012) asserts, maritime culture is an international culture and as a consequence, maritime heritage is international heritage which stands out for its international significance. The process on how shipwrecks become heritage is a process that I will explore in this work.

1.3. The sister ship: archaeology

For some authors such as Nafziger (1999), underwater sites are unnatural, since wrecked vessels do not belong *in situ* to the sea bottom but rather to their home ports and intended destinations. The author claims that the site of a wreck is fortuitous and as a consequence they do not need to be preserved nor their remains respected. This line of thought was developed before maritime archaeology existed and the sea bottom was already explored by other actors (Maarleveld, 2011: 925).

The oceans, today, are exploited by three main actors and their uses: transport and communication (including military uses), use of marine resources and finally non-material uses of the oceans and coasts such as marine research, education or tourism. In this last use, the research of shipwrecks (archaeological and non-archaeological) occupies an important place.

This dissertation has named *Archaeology* as the sister ship of *Heritage* for two main reasons that will be developed in the following chapters:

1. *Heritage* is discovered, analysed and researched by archaeologists.
2. *Heritage* becomes *Heritage* when archaeologists bestow it with a value (and the law recognises it).

As it will be explained, archaeology is the study of material culture to gain knowledge about human behaviour: it is the knowledge obtained from the relation between material cultural (data) and non-material human activity (interpretation) (McGimsey III, 1984). This is because a wreck is an entity, a site (Villegas-Zamora, 2008: 20) and as a consequence, the position and inclination of the objects provide crucial data. In addition, inside a ship, we have cargo and contents, fixtures and fittings such as anchor or cannons, minor structures such as decks or masts and major structures such as hull and ribs. To get information from these sites, it is important to understand the pre-wreck nature of a ship, the wreck event and the subsequent salvage (Gibbs, 2006). As a consequence, as McGimsey III (1984) remarks, the facts in archaeology are only the artefacts and the locations. The rest are hypotheses and theories. These theories convert the artefacts into heritage.

Whitfields (2000) adds that the history of navigation can be told from four main points of view: the human drama, the technical history of navigation, the complex commercial network or the political history. However, there is a general confusion in the bibliography between the terms “maritime archaeology”, “nautical archaeology” and “underwater archaeology”. The term “maritime archaeology” has to do with everything connected with seafaring, which is the main difference with nautical archaeology, more concerned with maritime technology. Nautical archaeology is those boats and ships found even in a non-maritime context. On the other hand, underwater archaeology also includes those sites that are not concerned with maritime activities, like ancient land surfaces underwater (Muckelroy, 1998: 24). This work will be referring without distinction to underwater archaeology or maritime archaeology.

Underwater (or maritime) archaeology is a nascent discipline. It started to develop just after World War II. According to Gibbins and Adams (2001) maritime archaeology first started with divers who learned to be archaeologists and land archaeologists who learned to dive and finally academically qualified professionals in maritime archaeologists.

Maarleveld (2011: 924) identifies four different traditions on maritime archaeology: Mediterranean (or classical) (more focused on the comprehensive survey), northern European (or prehistoric) (with more emphasis on display rather than on research and on geological and stratigraphic data), cultural resource management and maritime historical exploration. The four have their own ways of thinking but all share the same ethical dilemmas as this study will try to demonstrate. The complexities that this carries are even wider because of the fact that it is a multidisciplinary domain. Just to mention some, it comprises some of the techniques of land archaeology, it requires some knowledge of oceanography (for the chemical composition of water or the study of currents and water

temperature), history (shipwrecks disclose important information on the study of maritime routes, naval architecture, battles, among others), heritage (shipwrecks are considered monuments, pieces of art, part of the heritage of a community, a country or a culture), law (the delimitation of the water or the protection of the heritage play an important role on the construction of the sense of underwater heritage) and, of course, ethics. In this multidisciplinary domain this study is situated. For instance, oceanography for the preservation of the objects underwater will be used, especially in the Chapter on climate change (4.IV.) and also a little bit of history will be needed in all chapters besides heritage, law and of course, ethics.

For Dean *et al.* (1996) what is not archaeology underwater is salvage, treasure hunting and souvenir collecting or museums living with treasure hunting. However, Bederman (1999) claims that underwater cultural heritage is being managed in only one way: by the stands of only one community (archaeologists) without consideration for the interests of other users. This is where the most contentious issue on the protection of underwater cultural heritage comes along, and although this dissertation is not going to examine the treasure hunting issue (that has been already largely discussed in the literature) it is necessary to mention it as part of an ethical issue in underwater cultural heritage. This study has named it “the initial enemy” because when talking about the ethical concerns of protection of underwater cultural heritage, archaeological and legal efforts have been made in this direction. However, after developing this work, I have realised that there are other “enemies” that can damage the heritage in a broader sense, as it will be explained.

1.4. The initial enemy: private companies

Some of this underwater cultural heritage, especially the historic shipwrecks, is not only archaeological, artistic or historical items but also pieces with a possible high economic

value (Hoagland, 1999). The sphere of underwater cultural heritage is both a hidden archaeological patrimony and an economic resource not only for states but also for private companies. “Treasure-hunters” plunder wrecks for valuables but Dromgoole (2004) estimates that a wreck needs to be worth more than US\$10 million to be commercially attractive for salvage and that there are only around 100-200 such wrecks on the seabed. It means that only these shipwrecks are going to be appealing for the treasure hunters. However, due to the romantic notion of treasures at the bottoms of the oceans, underwater cultural heritage has been subjected to “not-professional” treasure hunters that spoil the objects without an adequate archaeological record, selling the pieces and making a profit out of them.

Bass (2005: 27) said:

archaeologists face the constant threat of the looting of historic wrecks by treasure hunters for personal gain rather than for the benefit of humankind. [...] No countries have ever benefited as much from treasure hunting as from true archaeology, which results in museums that attract thousands, even millions, of visitors.

However, Wreckwatch (2011) maintains that treasure hunting is now extinguished and *commercial marine archaeology* has emerged. For instance, in Southeast Asia, governments cannot afford excavating shipwrecks and displaying the items (Flecker, 2002). As a consequence, commercial companies are necessary to provide funding because as Flecker (2002) affirms, in Indonesia’s archipelago, for instance, there may be more historic shipwrecks than in any other country in the world. For this reason, a policy was formulated by which groups could salvage historical shipwrecks in Indonesian waters and 50% of the salvaged cargo would belong to the government. As Flecker (2002) affirmed, the country lacks trained personnel and as the industry is profitable, fishermen look for new archaeological sites now even though they are not trained and do not follow

archaeological standards (Kaiser, 1993). For Flecker (2002), a great deal of information is being lost every day throughout Asia and the deals with the private companies are the only solution for these countries. From UNESCO, however, efforts are made to train people as archaeologists with projects such as the *Training Manual for the UNESCO Foundation Course on the Protection and Management of Underwater Cultural Heritage in Asia and the Pacific* (Manders and Underwood, 2012).

Maritime commercial archaeological companies are also common in Europe and America. Construction or development of ports and harbours require previous analysis and research for archaeological materials. Excavations are executed by archaeologists but paid for by construction companies. The archaeological process needs to be fast since the construction companies are paying the cost. As a consequence, underwater archaeologists argue that commercial recovery do not produce good archaeology and that salvage law, for instance, should not be applied to historic shipwrecks (although some of those shipwrecks are subject to marine *peril* such as fisheries or construction).

Underwater archaeology is an expensive business as Kingsley (2001) claims. He defends that underwater archaeology has different hazardous moral mazes, such as the extreme cost of excavating, cargoes languishing in museum store rooms or the funding of excavations. The author calculates that every month of underwater excavation requires one year of conservation, registration and research on land.

In this line of thought, Fletcher-Tomenius and Forrest (2000) argue that although historic shipwrecks are an archaeological resource, they can also contain cargo capable of re-entering the stream of commerce, be of interest to biologists or they can be an obstacle for the oil and gas industry, for instance. For these authors, archaeologists have enjoyed “disproportionate attention in the debate” (Fletcher-Tomenius and Forrest, 2000: 1) since

besides the archaeological community, other groups have interest in the resource, such as treasure salvage companies and the sport diving community. The authors claim the archaeological community has too much influence in the political arena and legislation has taken a disproportionate account of their user group interest. However, and because salvors have never acted as a group, they have no influence on the political decisions around heritage.

What is more, and according to Kingsley (2003), it has been these private companies that are developing underwater archaeology. For instance, he maintains that deep-water excavation is possible thanks to the company *Odyssey Marine Exploration* that was the first to excavate a deep-water shipwreck. In addition, Kingsley (2003) claims that private companies are incorporating new methods and standards for the future of deep-water excavations. In this regard, and according to Fletcher-Tomenius and Forrest (2000), some salvage companies, like *ProSea* are promoting responsible and professional recovery of deep sea historic wrecks. For them, salvage is applicable but the *International Convention on Salvage* (1989) should not apply, where the salvor has the right to keep the artefacts rescued. The company *ProSea* has also created a *ProSea Convention* with statements suggesting that the State has preferential rights to purchase the salvaged artefacts.

However, that is the main problem in the conflict between archaeologists and private companies: the problem may not be the commercial recovery, but commercialisation of the objects *per se*. Underwater archaeologists claim that artefacts from shipwrecks should never be sold or be part of private collections and that dispersal of collection does not allow scientific study. Treasure salvors argue that other cultural items, such as paintings, can be of private ownership and economic utilisation and should not be

different to underwater items. In addition, they defend that economic benefit can also be obtained from media rights or exhibitions of those objects which do not damage the heritage (Fletcher-Tomenius and Forrest, 2000). As an example, in a case study that Kingsley (2001) analyses in his paper the *Hoi An* and the *Tek Sing*, both shipwrecks have been excavated by private companies to scientific standards and the results have been published. However, the objects on board those shipwrecks were auctioned as treasures, which were denounced by archaeologists as the sale of “primary research data” (Kingsley, 2003). This is the main reason of debate between archaeologists and commercial salvors: the connotation of the word “treasure” applied to shipwrecks, which directly implies that the heritage has an economic value. However, some authors (Hoffman, 2006; Pickford, 1994; or Werner, 2013) still use this word.

According to Coroneos (2006: 112) Australia had already fought and won the battle over treasure hunters in the 1970s. Australian archaeologists do not seem to have to fight against treasure hunters since it seems difficult that shipwrecks with cargo worth millions of dollars are going to be discovered within Australian waters (Coroneos, 2006: 112). This makes shipwrecks unattractive for treasure hunters. However, the problem is not completely solved, since Australia still has the problem of Australian shipwrecks in international or foreign waters (Coroneos, 2006: 112).

However, and as it has been already seen, since there are only 100-200 shipwrecks around the world with worthy fortunes underwater, when those shipwrecks are found, discovered and recovered, then the issue with treasure hunters may be finished. In this case, the fight will not be against treasure hunters or private companies. The fight will have to be with the issues identified in this work: the disappearance of the historical shipwrecks because of climate change, the undervaluation of underwater cultural heritage (and as a

consequence its loss), the recovery, use and destruction of that underwater cultural heritage for other uses or the management of human remains contained in that cultural heritage. These ethical concerns will be the obstacle to success.

1.5. The real enemy: the issues

This dissertation evaluates four primary case studies from which will be drawn some conclusions on ethical concerns and propose solutions. The case studies have been chosen specifically because of the interest they have drawn through conferences and publications among the archaeological community and the political agendas. These four case studies will be devoted to challenge four main pillars on the management of cultural heritage: valuation, use, management and preservation. As Figure 1.1. shows, each one of these concepts will be analysed in relation to a different case study.

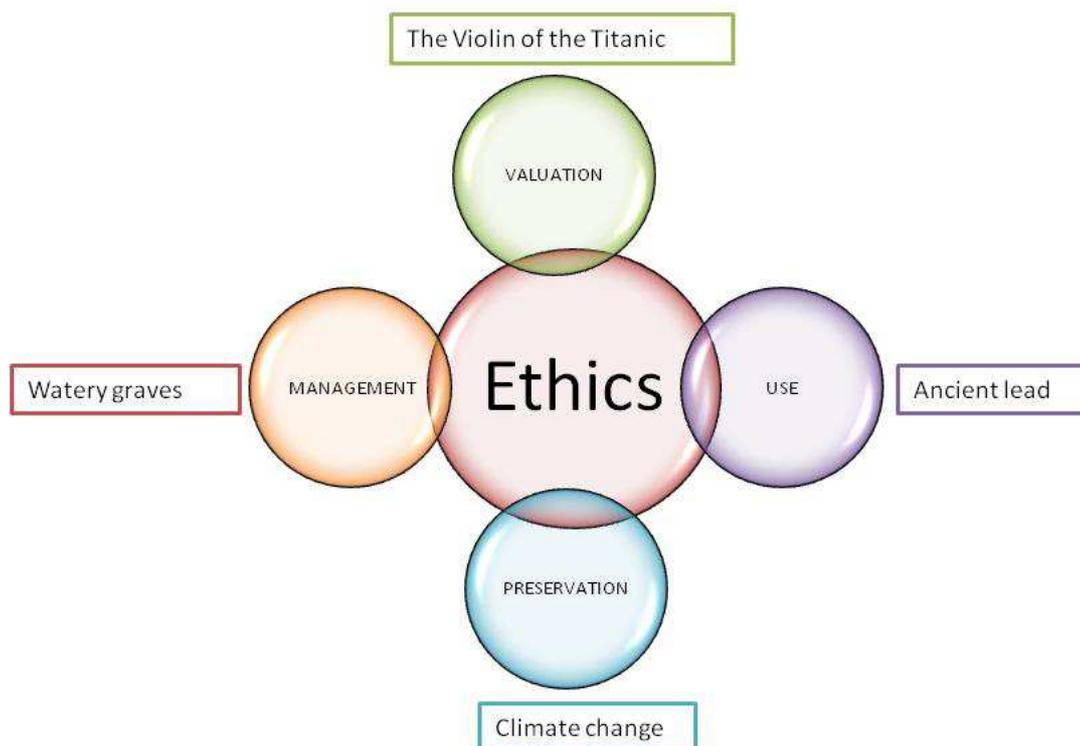


Fig 1.1. The four main aspects discussed and categories used for its consideration

1. Valuation: the violin of the Titanic

A common object that has gained prestige as heritage through a process of recognition of various values by different stakeholders: an historical value by the museum, an emotional value by the media and an economic value (gained because the other values exist) by the auction market.

The violin of the *Titanic*, an instrument that was sold by an auction house for £1.1 million is not recognized to be underwater cultural heritage under the 2001 UNESCO Convention because it has not been underwater for more than 100 years. The law, as a consequence, has been the one that has determined that *it is not* underwater cultural heritage. However, museums and auction markets through their management have given it a value of “heritage”. It has also been the cinema that has enhanced its value through emotion and a fake popular memory. The violin is said to have been played to calm the passengers while the cruise ship was sinking. No passengers of the *Titanic* are alive today. However, the public nowadays remember the sinking through the cinema. For this faked memory of the facts, the violin has reached such a high value. According to Nora (1996-1998) memory is the imaginary representation of historical realities. As a consequence, places or objects are symbolic because they signify the context of identities. As in the case of the violin, the multiplicity of interpretations gives new meanings to the history and history becomes remembrance (Nora, 1996-1998). For this value of identity and remembrance, the violin has reached a high economic value and has been sold. However, as part of the *Titanic* site, should this object not have been protected and kept in the collection as the ultimate symbol for the human tragedy that happened on that night in April 1912 and should it not be able to generate emotions for all those people interested in the story through the media?

This case study was chosen when I read the news of the violin auction in the newspaper and attracted my attention because I am a violinist myself. Then I started to ask questions about its significance and value. It ended up being a topic with more ethical dilemmas than was expected in the first place. It questions the method for awarding values, as well as problems such as authenticity, manipulation of heritage for tourism, feelings provoked by an object and memories implanted by the media and cinema. It also challenges the 2001 UNESCO Convention in relation to the definition of “underwater cultural heritage” as “artefacts that have been underwater for 100 years”. Finally, the chapter will propose some solutions for the violin to be heritage available to all.

2. Use: ancient lead and particle physics experiments

Legal uses of underwater cultural heritage: ancient lead (from shipwrecks that are more than 100 years old) is being used for experiments in dark matter detection. However, this creates a controversy for two main reasons: the uses that would have justified the destruction of this part of the heritage and the amount of information loss, depending on how it is recovered.

The chapter on ancient lead posts the dilemma of using the heritage for uses other than heritage. The simple explanation is: ancient lead is considered underwater cultural heritage but it is needed by physics laboratories and the microelectronics industry, which means that it is being retrieved either by archaeologists (after an agreement) or by salvage companies. The issue is whether any of these options are legal and if they could be a problem for archaeologists. Hoffman (2006: 283) asks: can salvage accommodate the values of archaeology? Maybe this is the only option, i.e., legal retrieve for legal purposes.

This case study attracted the attention of the author when, after giving a conference presentation on protection of underwater cultural heritage, a physicist commented that in

her laboratory ancient lead was continuously used for experiments on particle physics. After studying the topic from the media, the author travelled to the Gran Sasso National Laboratory of particle physics in Italy that was carrying out experiments using ancient lead to see how the lead was managed. After some publications by the author, the topic raised the debate in the press. It established a debate with what it seemed two opposing disciplines: archaeology and physics. However, the main aim of this case study will be to explain the topic unifying the facts of the two sciences, reaching conclusions according to the law and proposing solutions for a common arena where both fields can coexist.

3. Management: watery graves

The chapter deals with ethical issues on the protection of human remains contained in underwater cultural heritage. In this regard, it looks both at those shipwrecks that still conserve human remains and those where the remains have disappeared but were once there. In addition, it deals with the definition of the term “underwater cultural heritage” by the 2001 UNESCO Convention and the lack of recommendations by legal instruments for the treatment of these remains.

The bibliography on human remains contained in underwater cultural heritage is limited. However, the management of human remains in other disciplines (similar disciplines like land archaeology or different disciplines like medicine) is a well discussed topic. This work will try to adhere only to that which is more relevant to the topic: the issue of the valuation of the human remains and the management (or mismanagement) of the shipwreck that contains them. Management of human remains contained in underwater cultural heritage is (as dealing with human remains in any other discipline) a delicate issue, mainly because of the emotional aspects that it carries (Sayer, 2010). However, although the topic may be a highly subjective one, the decision has always to be based on a scientific

approach based on determination of values and inside the archaeological management ethics (MacLeod, 2008). There is a link between the requirements of conservation of the shipwreck and ritual and ethical issues (MacLeod, 2008). As MacLeod (1993) stated, the correct management of the ethics, religious and social implications and also the recovery and preservation of the human remains in aircraft and shipwrecks will contribute to making the public more aware of the real value of this heritage. The establishment of respect for the deceased or the development for the future faces complicated moral questions. It is a tension between traditions and sciences (Teague, 2007).

Although human remains on land archaeology has been a debated topic, in the realm of underwater heritage the bibliography is almost non-existent. However, the importance of the topic has already been highlighted since some nations have already established legal frameworks to protect those human remains. In addition, the term is included in the definition of “underwater cultural heritage” under the 2001 UNESCO Convention. However, the ethical dilemmas around the topic have not been discussed and protocols for management of shipwrecks with or without human remains have not been established. In addition, whilst researching at the University of Queensland in 2013, an opportunity given by *Universitas 21*, I was exposed to a situation which I didn’t know existed: the coexistence in the same country of the most populous Western living population and indigenous groups, both with the same rights over the land, the heritage and the human remains but each with completely different attitudes towards these issues. This allowed me to look at this chapter from a different point of view, taking into consideration traditions and cultures that for being in a Western country I would have never faced. The chapter, as a consequence, hopes to fill the legal and ethical gap on the topic as well as offer solutions introducing three concepts applied for the first time to human remains in base at this variety of cultural attitudes: absent, invisible and intangible heritage.

4. Preservation: climate change and how it will affect shipwrecks.

In the realm of archaeology preservation in situ is usually the first option but not always the preferable or only option. Climate change challenges the norm as it affects underwater cultural heritage, as the chapter will try to demonstrate. It is time to test the “in situ preservation” option and offer new solutions. For this aim, this chapter proposes a new partnership: natural/cultural resources.

The chapter will be looking at the preservation of shipwrecks *in situ*. One of the common agreed principles in the preservation of underwater cultural heritage named by the 2001 UNESCO Convention is the preservation *in situ* (Rule 1). The reason for this is mainly because archaeological objects are better preserved under layers of mud and in saline water. However, seas are changing and climate change may affect not only the marine environment but the cultural heritage lying at the bottom of the sea. It is necessary to consider whether shipwrecks will remain better preserved or on the contrary the effects of climate change will have a more profound impact on them. If the seas are changing and the shipwrecks are in peril there must be a point where we need to deal with the preservation and conservation before we lose them all. Maybe it is necessary to choose what to preserve, how to preserve it and if preservation *in situ* is still the safest and best way for shipwreck conservation.

Climate change appeared to be the topic with fewer ethical dilemmas to be explored. However, after the chapter was developed, it challenged a main principle that the management of cultural heritage has taken for granted: preservation *in situ*. The principle, although widely discussed as suitable for preservation with present conditions, has not been examined under the lens of the future: climate change will challenge the concept since it will create more underwater cultural heritage (as some places will be covered by water)

but it will also destroy some (due to current changes or chemical changes). The chapter proposes the qualification of underwater cultural heritage as a natural resource for its preservation establishing the same common measures against climate change.

1.6. The crew: the ethics

As stated, this work deals with ethical problems raised in underwater cultural heritage field but which are common to heritage management. As Maarleveld (2011: 917) expressed: *maritime archaeology is part of the heritage field that is extremely well suited for the fine-tuning of ethical debate in archaeology*. The reason for it may be that since the field of underwater archaeology is still developing, new fresh dilemmas arise.

However, the topic of ethics in the general field of archaeology is not new: already in 1934 there was a forum for founding the Society for American Archaeology (Wildesen, 1984). In fact, ethics in archaeology is the same issue as other disciplines such as medicine, physics or education have long faced. Ethics may be complex and conflicting since, as Colwell-Chanthaphonh *et al.* (2008) claim, ethical dilemmas usually arise when there is a disagreement. However, as we will see, it is different when talking about ethical benefits or about ethical processes, the first being related to the consequences of the issue and the second one being related to the ethical decision of doing it. This differentiation, that will already be present in philosophical theories, will have opposing outcomes.

Dunnell (1984) identifies three kinds of moral issues in archaeology: the ones that have just been raised, the ones that rose a long time ago but have not been solved and the new ones that are established in new facts. This study adds a fourth one: moral issues that only arise because of interference with the legislation.

1. Moral issues that have just raised: ancient lead. The topic of the use of underwater cultural heritage, not for economic purposes but for experimental scientific purposes, like particle physics experimentation, for the benefit of humanity. The choice is between protecting the past and developing the future. And if we choose the latter, which kind of experiments are worth destroying underwater cultural heritage for? Only experiments for knowing about the future? Only experiments for medical research? Or should any kind of technology also benefit?

2. Moral issues that rose a long time ago but have not been solved: watery graves. The management of human remains and the dichotomy between the age limit for protecting underwater cultural heritage (under the 2001 UNESCO Convention, shipwrecks and human remains underwater for more than 100 years) and the respect for those recent human remains with living descendants. For instance, why a deceased sailor's skeleton that died on board of the *Mary Rose* (which sank more than 400 years ago) is exhibited in the museum and how a sailor of the *USS Arizona* (sank around 50 years ago) is honoured every year by his family.

3. Moral issues that are established in new facts: climate change. The protection of underwater cultural heritage *in situ* might be the best option now but if seas are changing due to climate change and the shipwrecks are in peril there must be a point where we need to deal with the preservation and conservation before we lose them all. Maybe it is necessary to choose what to preserve, how to preserve it and if preservation *in situ* is still the safest and best way for the shipwreck's conservation.

4. Moral issues that only rise because of the interference with the legislation: the violin of the *Titanic*. The definition of heritage and the interpretation of value is a complex issue. The violin of the *Titanic*, a symbolic object, not part of the

archaeological site, but part of a collection, that has not been protected because it falls outside the definition of “underwater for more than 100 years” has been sold and is in hands of a private owner. There are arguments that define it as cultural heritage. But should it have been ever protected?

All these topics are important for our discussion because they all include as a main piece of study some parts of underwater cultural heritage. However, this underwater cultural heritage is heritage because there has been an ethical process that converts an object into heritage by bestowing it with various values. This process will be largely discussed in the Literature Review and challenged through all the four case studies. The Discussion and Conclusions will analyse the results obtained.

1.7. The sails: the law

The *2001 UNESCO Convention on the Protection of Underwater Cultural Heritage* was adopted on the 2nd November 2001 for the protection of underwater cultural heritage from salvage and spoiling, which was largely neglected before on an international level. The UNESCO draft was proposed by lawyers rather than archaeologists and commercial treasure salvors were not consulted (Fletcher-Tomenius and Forrest, 2000). This is why the archaeological perspective dominated the agenda. For Fletcher-Tomenius and Forrest (2000) the 2001 UNESCO Convention has done nothing to resolve the conflict between archaeologists and treasure salvage community. And according to those authors treasure salvage companies also have the right to underwater cultural heritage. In this regard, for Fletcher-Tomenius and Forrest (2000) prohibition of salvage, for instance, is unworkable and is going to be ignored by salvage companies.

According to O’Keefe (2002) the 2001 UNESCO Convention found that defining “underwater cultural heritage” was controversial. And although the United States proposed a definition “of historic or archaeological significance” there was no consensus and the time-limit was decided (Boesten, 2002). The interest of the United States was more for recent history heritage and the time-limit excluded for instance the remains of World War II. The 100 years qualification pretended to refine the concept of “trace” (O’Keefe, 2002). The reason for that figure was a cut-off for purposes of administration, and also that some national legislation, as international instruments, included 100 years on defining underwater cultural heritage. As a consequence, the time-limit became the main filter of the Convention. In this sense, two main issues arise:

- a) a definition under the term of a limit of years is focused more on the object, and not on the information we can obtain from it. However, those definitions are more of a concept of the history of art, and less of an archaeological one,
- b) the time limit does not allow an interpretation on the definition and significance and as a consequence values cannot be bestowed. Without a time-limit, definition could be based on values, and those being awarded by (1) the characteristics of the site or object and/or (2) the interest of that site or object for a community, a State or the international public.

Some authors (Carman, 1995; Carman, 2005) argue that the law shapes what is heritage by defining and protecting it and the 2001 UNESCO Convention it is the best example of this. This contrasts with the attribution of value in other kinds of heritage. For instance, in Jerusalem, Israel, the heritage is shaped by faith, of any kind and every religion shapes it in its own way: for instance, the Last Supper Room, which is sacred for Christians and respected (but used) by Muslims and Jews. No law protects it or preserves it but it has

been a shrine for 2000 years now. As an example to the contrary, in June 2014 archaeologists discovered a 5000-year-old pipeline in Western Iran (Holloway, 2014). However, it is not protected under the 2001 UNESCO Convention because the Convention states that *(b) Pipelines and cables placed on the seabed shall not be considered as underwater cultural heritage.*

The other convention that mentions underwater materials is the 1982 UNCLOS Convention on the Law of the Sea. At that time, maritime archaeology was what the UNESCO 1972 Convention called a “nascent discipline” (UNESCO, 1972b). As a consequence, the 1982 UNCLOS Convention did not give any real importance to this heritage, although it mentioned it in two articles. In addition, it is necessary to bear in mind that it is a law to protect the sea, not a law to protect the heritage and this differentiation will be detrimental to the heritage. For instance, for the protection of the heritage it is important to distinguish between the owners of the hull and the owners of the cargo (Pickford, 1994) but the rights and responsibilities get blurred when dealing with it because of the maritime zones (Maarleveld, 2011). Salvage laws established in this Convention were not developed with regard for archaeology.

However, these two conventions are just one instrument. Other conventions, as we will see in the next chapter, will help to cover the issues that we are discussing. Although these conventions are not considered by the bibliography they can amend the legal vacuums that these two other conventions leave. They may not be specific to underwater cultural heritage but are still valid.

With no laws, there can be no heritage (Carman, 2013b). The law is important to the development of the idea of preserving material from the past. As the author reveals, legislation has a valuable role on definition, identification and preservation and protection

of the heritage: it gives value and meaning to archaeological remains. However, the problem is that the legislative basis for preservation is taken for granted. And those precepts have to be challenged.

As Lixinski (2015) observes, in heritage studies, scholars generally do not distinguish between binding and non-binding instruments and as a consequence do not understand the difference between those who are just “a code of practice” (such as the 2001 UNESCO Convention) and ones that are binding international law and that breaching them brings legal consequences (such as the 1982 UNCLOS Convention). However, although the *2001 UNESCO Convention on the Protection of the Underwater Cultural Heritage* is a code of practice, it is not easy to change: it is naive to think so (O’Keefe, 2002). It took years to approve it. However, it is worth remembering that this Convention has an annex that opens possibilities to improve. In addition, the Convention does not have funding which also facilitates the possibility of updating it. On the contrary, the *2003 UNESCO Convention for the Protection of Intangible Cultural Heritage*, for instance, which has funding (and does not have annexes), would more difficult to modify. The 2001 UNESCO Convention has a real possibility of more easily adapting its precepts if that benefits the preservation of underwater cultural heritage.

I am aware that challenging the 2001 UNESCO Convention is a complicated goal for this dissertation but, as Bederman (1999) asserts, the 2001 UNESCO Convention failings are systemic (for instance the UNESCO ignores the rights of the fishing industry) and philosophical. These philosophical vacuums will serve to establish our hypothesis. Our hypothesis is that legislation has tried and failed to find a proper definition of heritage because it is anchored in old fears. This study, as a consequence, will try to challenge new concepts that the legislation have taken for granted.

1.8. The cargo: the problems

There have been three main problems faced while working on this dissertation:

1. The almost inexistence of bibliography on the topic: the current state of the bibliography on ethical dilemmas on the preservation of underwater archaeological remains is not extensive. In addition, the four topics chosen as case studies are mostly new situations and time has not allowed exploration into this.
2. Narrowing the topic: as a consequence of this shortage on the bibliography, since it was necessary to research other branches, there was a point where everything looked too interesting and worthy of inclusion. One of the challenges of this work has been precisely to limit the research. Working with ethics, laws, values and cultural heritage means setting the boundaries has been complicated; especially with ethics since they are applicable to every scientific/human field and not specific to archaeology.
3. Distinction on each one of my topics with the land discussion: this dissertation aimed to be a discussion on the heritage management debate in general through examples arising in underwater heritage management in particular. However, although a continuous reference to the land field was necessary, the danger was to use land archaeology as an example of underwater archaeology and not the other way around. Land archaeology, for its longevity, has strong-established principles difficult to modify. Underwater archaeology, on the other hand, for being a discipline still forming, has room for establishing new theories and proposing new solutions.

1.9. The canons: the research questions

Based on the already-mentioned reflections, three explicit research questions are defined in this work in order to accomplish two main objectives:

Objective 1: To examine ethical dilemmas challenging the main management pillars that protect underwater cultural heritage

Research question 1. Which are the pillars on which the protection of underwater cultural heritage stands?

Research question 2. Are there case studies that challenge those pillars?

Objective 2: To identify whether current international legislation (and some national legislation) solves these controversies.

Research question 3. Are legislations the driving forces that manipulate the process and define the heritage?

The consequence is that we will look at heritage that has not met the legal recognition of being “heritage”, such as the violin of the *Titanic* and we will also deal with heritage that has been legally recognised as “heritage” (e.g., the “ancient lead ingots”) but that their intrinsic value do not recognise them as such.

1.10. The strategy for the battle: structure

The introduction has tried to summarise the issues that we will find on the following pages of this work. The chapter has outlined the course of this dissertation which is divided into five basic sections: preparing the ship, departing on the journey, the battle, the sinking of the ship and the preservation of the shipwreck.

1. Preparing the ship: Literature Review. A deeper understanding of the material that the introduction has mentioned will be carried out in the Literature Review, where there will be an analysis of the process that starts by defining heritage by bestowing it with a series of values according to the ethics. The ethics will be translated into words by the law, and the law will decide what is and what is not heritage. The process, from there, starts all over again. Given the pivotal role that ethics and values play in the management of underwater cultural heritage, the Literature Review chapter will be mainly devoted to these aspects.
2. Departing on the journey: methodological approach. The chapter will examine the methodology used to assess and reach an understanding of the issues. It will also explain the structure of the case studies, how the solutions have been drafted and which texts have in the main been used.
3. The battle: these chapters will be devoted to the four case studies (I, II, III and IV). Violin of the *Titanic*, use of ancient lead, management of human remains and climate change will be the four studies that will analyse four main concepts on management of heritage: valorisation, use, management and preservation. The case study will all have a basic structure: introduction, explanation of the issue, state of knowledge, legal perspective, ethical dilemmas and conclusions. In addition, at the end of each chapter, a section called “proposal” will examine possible solutions to the issues discussed in the chapter.
4. The sinking: discussion. We will analyse the main theories obtained from every chapter and we will try to evaluate the efficacy that the proposals can have on the protection of underwater cultural heritage.

5. The preservation of the shipwreck: conclusions. In the last chapter this work will draw some conclusions, summarise the main problems and analyse the suggested proposals for future guidelines on the protection of underwater cultural heritage. We will return to statements of the research aims and questions included in this Introduction and will examine how this work has answered them. We will also look at the problems encountered, areas that have not been possible to address and which areas will benefit from this work.

The result of the dissertation will be a series of topics intertwined but in a clear structure of subdivisions for the reader's convenience.

The general debate on ethical aspects on the management of underwater cultural heritage does not offer solutions. For this reason, it is necessary to reset some terms and to build new concepts. At the end of the day, our actions towards the management of the cultural heritage will set a precedent for the future.

This work is a complex task because, as Dunnell (1984: 62) observes,

it is a presumptuous and intimidating task to write on any moral issue within archaeology [...] since it is impossible to argue rightness and wrongness without offending nearly everyone almost all of the time.

However, because these issues are not addressed in the bibliography, it does not mean that they do not exist. The only solution, under our point of view is face them, approach the facts and raise the debate.

Chapter 2. Preparing the ship: Literature review

The major difference between the violin rescued from the *Titanic* and the most expensive violins, the *Stradivarius*, is that the first is an inexpensive factory-made violin with not a special quality sound. However, it became famous (and economically and culturally valued) because it is the last sound of music heard by many of the people who died on board the *Titanic* and as a consequence it has, as part of the story, gained mythical status. Accordingly, the value of the *Titanic* violin has become part of a collective memory, inherited through storytelling (prosthetic memory) and continuous communal interest.

This example shows how values are always attributed to an object: it is the process of attributing to it values that turns the object into heritage. However, as we will see, definition and attribution of values to archaeological and cultural material have changed throughout history. Although all values are legitimate, individuals and organisations emphasise some more than others depending on their needs and goals. However, for being heritage and since heritage belongs to all, this emphasis has to be established according to certain ethics that will ensure that everyone benefits from it.

The management of heritage and its linked concepts such as “culture” have been widely discussed in the bibliography since it has been acknowledged that its preservation is important. For Aplin (2002) this importance lies on its power to locate the present lives both geographically and historically. For the author, heritage implies a gift for future generations. Lipe (1984) argues that “our lives are made meaningful by culture” and that culture is a symbol and a mean of communication. They are a symbol of the common human interest and of the continuity of past, present and future. A heritage object matters

because as Bator (1981) states, the preservation of culture constitutes the humanity's fundamental goal: culture elevates and civilises. And the community trusts the archaeologists to manage and safeguard these nation's cultural assets (Holtorf, 2005). As a consequence some authors maintain that the engagement should not be with the past, but with the future and the present (Colwell-Chanthaphonh *et al.*, 2008). However, and in order to manage these pieces of cultural, the heritage objects are awarded with a value by archaeology, a value that transform a normal object into a piece of heritage that is worth preserving.

Nonetheless archaeology cannot be seen as an isolated discipline as different branches are in juxtaposition to archaeology when awarding a value to an object; for instance, anthropology, sociology, politics, law or management theory (Aplin, 2002). To overlook this juxtaposition will lead to the emergence of dilemmas which are difficult to resolve.

In the specific case of underwater cultural heritage, Baker (1998: 17), for instance, highlighted the great number of interests involved in the study and valorisation of a shipwreck: a technical historian will study the vessel's shape, an archaeologist will record the cargo and passengers, a salvor will look at the items which can be economically valuable and an oil company will see them as an obstruction to a proposed pipeline. In this regard, Kingsley (2011) emphasises the wide scope of industry on the sea, from the expander regime of exploration of sea resources to construction of submarine cables that the management of underwater cultural heritage cannot hog. For instance, pipelines and cables' private companies do not have regulations when dealing with an archaeological site (Perez-Alvaro, 2013b).

However, the study of archaeological sites is important since as Werner (2013) defends human history owes a great deal to maritime activities: “in any preindustrial society, a ship was the largest and most complex machine produced” (Muckelroy, 1998: 23). For this reason, maritime archaeology should be a primary focus of man: not for the study of objects for their own sake but for the insight they give to people (Werner, 2013). This has been one of the main goals of this study: not the study of specific objects but its significance from a sociological point of view.

Since underwater cultural heritage was in danger of natural as well as human threats when the *2001 UNESCO Convention for the Protection of the Underwater Cultural Heritage* was drafted, it established a legal system of protection to avoid specifically those menaces. The Convention came before the discipline had the time to develop. In land archaeology, it was the other way around: the discipline developed for years, and eventually a regulation to protect it was created. In the case of underwater cultural heritage there was insufficient time for that. Therefore the legal instrument left vacuums in valuing, managing and protecting the underwater cultural heritage. In addition, as Kingsley (2011: 224) believes, management of underwater cultural heritage faces “inadequate financial resource and a lack of creativity”. For Fleming (2010), infrastructure development is often seen as the enemy of cultural heritage preservation. New technologies allow both legal and illegal activities that threaten the maritime heritage, but as Flatman (2007: 141) claims, maritime archaeologists are obsessed with technology because the origins of maritime archaeology that already need technology have yet to be researched. For this reason, little attention is given to more “philosophical” issues. However, as Kingsley (2011: 226) states, “nobody wants or can afford another *Mary Rose*”.

At the time of writing this dissertation the bibliography regarding the protection of underwater cultural heritage is limited but is starting to proliferate. The most common bibliography is the one dealing with the legal protection of underwater cultural heritage. The compendium of Dromgoole (1999) and her recent review is indispensable for a law review of some of the most important maritime countries (United Kingdom, United States, Greece, France, Italy, Spain, China, Turkey and Australia, amongst others) along with Boesten's (2002) review of public international law for valuable shipwrecks in international waters. The articles of Forrest (2002), Gibbins and Adams (2001) and O'Keefe (2002) are significant contributions which update the current situation. The book of Professor Strati (1995) is still the "Bible" for the researcher in the discipline and Aznar-Gómez's remarkable study (2004) examines the international legislation and the *2001 UNESCO Convention for the Protection of Underwater Heritage*, with special reference to Spanish national legislation. Although compact, it is thorough and an effective approach to the topic with more than 900 references to the investigations of others. Finally, the recent book of Dromgoole (2013) is the most complete review of the legislation in relation to underwater cultural heritage.

Conservation and preservation of underwater cultural heritage is the second field where the literature is vast. However, the specific field of management of underwater cultural heritage is still scarce and it is necessary to consult bibliography on land archaeology to solve some of the dilemmas.

Figure 2.1. shows how this chapter will be organized and according to which criteria. First, it will look at the bibliography on management of cultural heritage: heritage, values and ethics. Later, we will look at the bibliography on legal aspects of underwater cultural heritage. The chapter will be shaped as a process where heritage is formed by law

and law is a consequence of awarding values according to ethics to heritage. In addition, some other concepts linked to this process will be analyzed, such as identity, emotion, memories, politics and ownership of heritage.

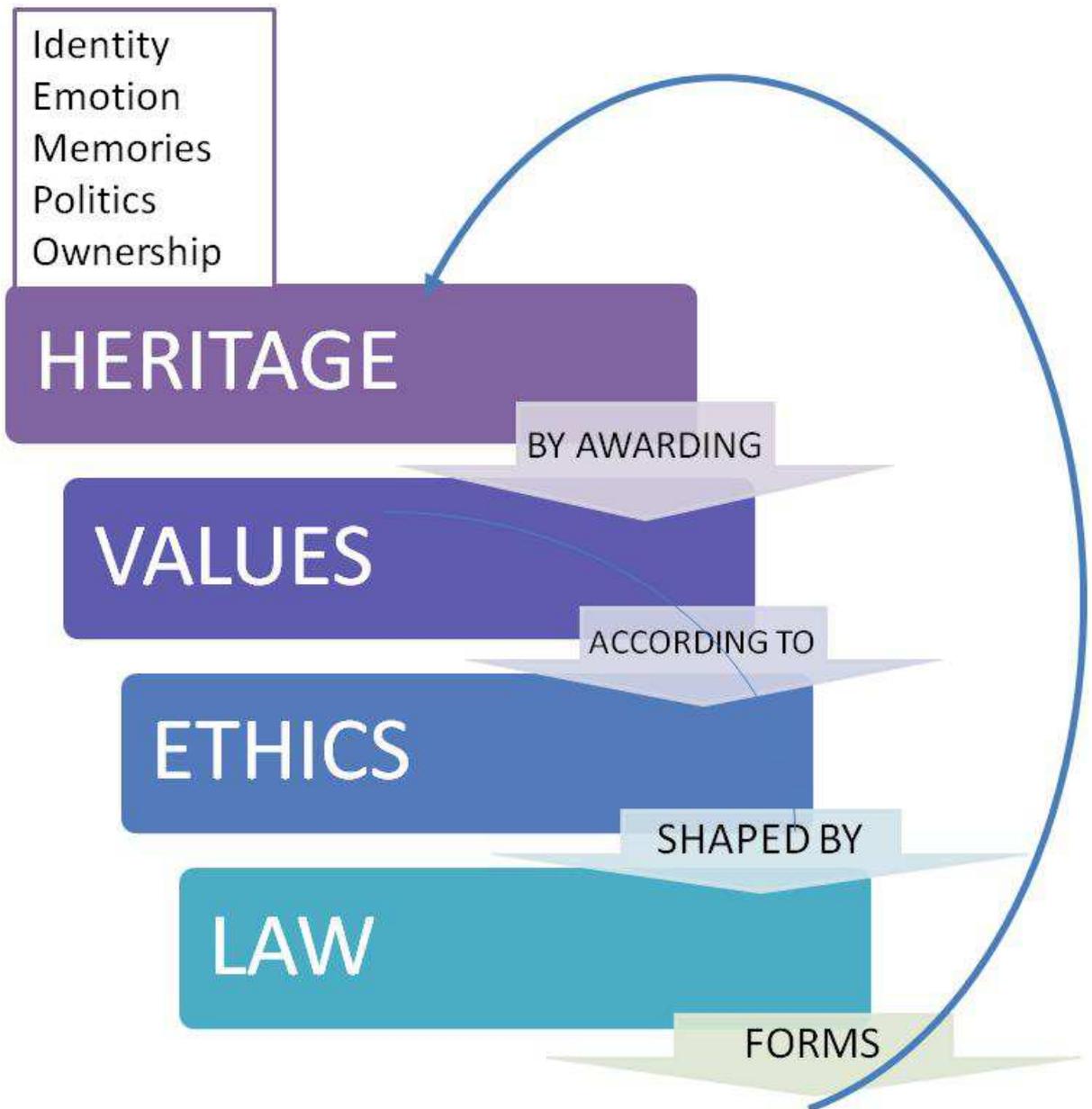


Figure 2.1. Diagram showing the process of heritage formation

2.1. *Heritage*

One of the main points of this work is challenging the concept of “underwater cultural heritage”. However, to obtain satisfactory outcomes we first need to understand the concept of “heritage”. In this regard, there has been a quick expansion of the definition of heritage in the last decades (Harrison, 2013). Many academics have written extensively about heritage and different points of view are taking into consideration.

1. Heritage as *material*: this is the oldest approach. In fact, the idea of heritage as “things” is exemplified by the *UNESCO World Heritage List* that in 2014 included 1007 properties²: therefore “heritage” is defined as “properties”. In this regard, Howard (2003) defines heritage as *what* people want to save, collect or conserve and it is recognised or designated. The *1972 UNESCO Convention Concerning the Protection of the World Cultural and Natural Heritage* claims that judgement on the importance of a site to be listed needs to be made scientifically or objectively but Graham and Howard (2008) believe that this selection in a list excludes others equally important but undiscovered from being heritage. In addition Smith (2006) understands that this misunderstood concepts of heritage as “things” are only useful for making (and interpreting) stories (and ideas) tangible but not for its protection.
2. Heritage as *ideas*: for Aplin (2002) heritage is not only material but mainly ideas and stories. In this regard, groups vary not only in terms of the parts of the story but also the symbols for telling them (Pitchford, 2008). However, as Pitchford states, the closer these stories are to the present, the harder they are to tell, since each group has its own perception of what is important in heritage terms, in addition to the perceptions of each individual in those groups (Aplin, 2002). It depends on a

² UNESCO World Heritage Centre: World Heritage List. Available at: <http://whc.unesco.org/en/list/>

person's background, life experiences and personality, along with the local historical, social and cultural circumstances of the group to which the individual is ascribed. Lenihan (1989) agrees and argues that people see the same event in a different way, according to their psychology and experiences. Heritage, he claims, is therefore a laboratory for analysing society's myths, symbols and images.

3. Heritage as *data*: for Smith and Waterton (2009: 42) archaeology is the basis of heritage management and heritage and archaeological data have a synergy that makes heritage "knowable"; heritage is data for archaeologists and this creates problems for communities, for whom heritage has an emotive dimension, as we will see below.
4. Heritage as *process*: there has been a recent trend towards defining heritage as a "process" rather than a concept. Smith (2006: 1), for instance, defines it as "heritage work": a cultural and social process of renewing memories, which is not only about the past or material things but a "process of engagement, an act of communication and an act of forming meaning in and for the present". The process, as a consequence, consists of the activities undertaken around those things, a process that identify them as symbols and give them a value and a meaning, sometimes even an identity. English Heritage (2008) explains the process as the "Heritage Cycle": if people understand the history of heritage places, they value them, they care for them, they enjoy them and they will understand them more. However, the precept they use as a basis is already misunderstood; for people to understand the history of heritage places, those places have to be pre-defined as heritage; if not, visitors will not go to see them. Other authors have attempted to define heritage and although they have not used the word "process", they still

include the concept. For instance Lipe (1984) had already established this idea of heritage as a process when in 1984 he claimed that all cultural materials are potentially cultural resources but because not all of them can be preserved or studied: we must make choices based on evaluation and re-evaluation according to the needs and fashion of the period. As Carman (2013) defends, only recognition of cultural heritage transforms archaeological deposits into cultural heritage. This evaluation of the material, this process, as a consequence, is what makes them heritage; heritage only exists if it is managed. Ashworth (2007: 8) supports this concept of heritage as a process which defines as “a medium of communication, a means of transmission of ideas and values in order to satisfy various contemporary needs”. He concludes that heritage is socially constructed, “contested along several different axes (the temporal, the spatial, the cultural/economic and the public/private)” and that different meanings are assigned according to those combinations. Maarleveld (2009) more specifically defines heritage as the way it is experienced through this process. Graham and Howard (2008: 2) identify heritage as “the way in which very selective past material artefacts, natural landscapes, mythologies, memories and traditions become cultural, political and economic resources for the present” and they point out that it involves not so much the study of the past but more “the contents, interpretations and representations of the heritage selected according to the demands of the present”. The authors claim that “selection” of heritage is the key that shapes the meaning and importance of the heritage. This selection excludes those who do not subscribe to the meaning awarded to that heritage. All heritage, Smith (2006: 2) concludes, is intangible; in fact, “there is no such thing as heritage”.

In this task of defining heritage, authors have linked the concept with other notions:

1. *Identity*: “identity” seems a concept intrinsically linked to the concept of heritage. According to Graham and Howard (2008: 6), the interrelationships between heritage and identity are “both spatially and temporally variable“, since they are defined by the consumer. Identity is the process of inclusion and exclusion that defines communities and this process is led by heritage (Graham and Howard, 2008: 5). For Ashworth (2007) heritage is a need of the individual and of society to reinforce a socio-cultural identity: it is a contemporary commodity. Ashworth (1994) had previously been more specific by talking about “national identity” that can be shaped through a few selected points of heritage and supporting mythologies. According to Pitchford (2008) museums and other attractions, and the law, are political and powerful resources for the construction of national identities. However, for Prott and O’Keefe (1984) the legislators decides the law may be feasible or desirable but only the cultural heritage managers decide what to preserve as part of this identity. For Prott and O’Keefe, the word “heritage” says that something is cherished and has to be preserved but is both data (for archaeologists) and sense of identity. For Howard (2003), identity is like Russian dolls: we do not have different hats; we have an outfit of clothes, so this is how we have different identities. However, according to the author people need to be represented by their heritage, since “treating everyone as a visitor” neglects a sense of identity (Low, 2004: 400). In fact, the seven volumes of *Les Lieux de Memoire* (Nora, 1996-1998) analyse the way an object of heritage can become an evocative symbol of identification that acts as a trigger for emotions and narratives. For Firth (2002), in fact, the role of archaeology is being applied

to be a soothing balm of nationalism, an idea likened to identity. However, this identity is more difficult to reach on some underwater cultural sites since for instance a ship embodies much greater diversity for the history of many countries, not only one (Smith and Couper, 2003).

2. *Emotion*: this identification of a person with a place or an object is established because the person identifies itself with the place (or object) and feels something related to it. In this regard, Smith (2006) concludes that the “real sense of heritage is when our emotions and sense of self are truly engaged”. In fact, this is precisely the point we will develop in Case Study I: the violin of the *Titanic*, namely, how a common and cheap object becomes valuable heritage through the emotions it has created in people. The emotional value of heritage is felt and it is reinforced through experiences and re-experiences that create a sense of nostalgia (Smith and Waterton, 2009). For these authors, nostalgia is an important issue and the heritage industry sanitise inauthentic versions to create this nostalgia (again, the violin of the *Titanic* and the concept of prosthetic memory that we will see below). According to Russell (2010) heritage is a mixture of intellectual and emotional reasons to a material. Holtorf (2010) claims the same thing: heritage is not valued for the specific information it contains but for the notions it evokes among people.

3. *Memories*: memories, as emotions, are not spontaneous but they need to be actively remembered (Smith and Waterton, 2009): they need a root in a concrete object or site and need to be maintained. As a consequence, memory is negotiated (Stachel, 2006) since it deals with the past but takes

place in the present. As Viejo-Rose (2011) argues, cultural heritage is intrinsically political and symbolic, used *in lieu* of description to evoke memories or emotions. And it is highly selective. In this regard, there is a new concept is worth explaining here: it is the concept of prosthetic memory, which will be extensively explained and exemplified in the Chapter of the violin of the *Titanic* (4.I) in this dissertation. The term “prosthetic memory” was introduced by Alison Landsberg in 1995 to explain the influence of the media on peoples’ memories: it is the process of a media-identification (Landsberg, 1995: 175). As a consequence, the media user feels and remembers scenes of films or television programmes as scenes lived by them. In this regard, this dissertation adapts this concept from the media applied to heritage identification (Chapter 4.I).

4. *Politics*: Ashworth (1994) and Aplin (2002) claim that heritage contains a political component and that political actions mixed with heritage can be either extremely hurtful or extremely positive (Aplin, 2002; McDowell, 2008). Lipe (1984) also defends that humans attach names, myths and affective values to things that become cultural resource and every state develops its policy concerning heritage on the basis of what is worth preserving (Viejo-Rose, 2011). This political action is what results in the creation of law (Carman, 1996), an idea that will be analyzed below. In this regard, some authors have expressed that all selection of heritage (terrestrial or underwater) is a political decision translated by the law. However, Flecker (2002) argued that underwater archaeology differs from terrestrial archaeology in that the former is involved in politics and ethics.

For him, shipwreck policy is formulated with money in mind which does not happen in land heritage.

5. *Ownership*: a vast amount of literature has been written about the ownership of heritage but this study will try to summarise the main concepts. Carman (2005) published a whole volume on this aspect where he presents a range of perspectives on issues relating to the ownership and preservation of archaeology outside of private property. Carman defines archaeology as property and argues in favour of archaeology as common property and as an open-access resource. In this regard, Boyd (2012: 176) introduces a new concept: “cognitive ownership”, “a provocative term, drawing in the presumed force of economic or legal ownership to reinforce the power of an entirely non-statutory ownership, that of personal identification and emotional association with a place”. Scarre and Scarre (2006) also approach the concept in their edited volume where some authors discuss the issue of archaeologists as guardians of heritage, introducing a concept of “stewards” instead of owners since the main idea of ownership is that if you own something you can do whatever you want with it, even destroy it. However, there should be a relationship between individual and collective human and cultural rights (Harrison, 2013). Some authors defend heritage as owned by the public. For Ready and Navrud (2002), cultural is non-excludible (enjoyed by all) and has non-rivals in consumption (two different people can enjoy it at the same time without interfering). They maintain that the decision-making of making the heritage a public good will be based on a sense of duty and moral purposes, on ethics, as we will explain later. For other authors, there are different owners

of the heritage. Young (2006), for instance, identifies four candidates to own heritage: individuals, cultures, nations or all humanity although his hypothesis is that heritage belongs to cultures since a culture is a family resemblance concept. Gillman (2010) defends that the heritage belongs to a particular people and place and then to all humankind. Leaman (2006) admits heritage can be privately owned but he identifies three precepts: (1) legal ownership means possession; (2) legal ownership is never absolute since it belongs to a wider community; (3) human relics are a special category and should not be treated like everything else. In this regard, Maarleveld (2012) expresses differences between the feeling of ownership (which can be disrespectful in large immigration societies, for instance) or the exclusive ownership. Prott and O'Keefe (1984) also remind that some states assert ownership of heritage and some exert control without doing so. However, states usually claim right of ownerships from the moment of discovery (Carman, 2013b): this nationalisation rides over private rights. The author identifies other alternatives such as regulation by allowing private ownership or having use of the land with limitations or control of use. These possibilities will be discussed in the violin of the *Titanic* Chapter (4.I.). However, in this regard, Maarleveld (2008) states that ownership does not have to be identified before taking any action on management of cultural heritage, since meaning comes first.

In heritage management nothing is fixed and everything can change. This is due to the fact that heritage has many uses but also multiple producers (Graham and Howard, 2008: 4), each one of them with multiple objectives. These uses, producers and objectives

are the ones that manage the heritage. According to Carman (1996) and based on the *Venice Charter* (1964), this heritage management can be defined by four basic principles:

1. Heritage is finite and non-renewable
2. Heritage is of public interest
3. Heritage is governed by legislation
4. All the components of the heritage require testing for significance

This last point, the topic of significance on heritage, is what we will be talking about in the next section. However, measuring cultural significance is dynamic and relative and depends on the context and varies over time (Carman, 2002) and, as a consequence, academics have failed to agree on priorities (Coningham *et al.*, 2006). It seems to be more important to preserve the exceptional than the representative. However, for Aplin (2002) there are some criteria to establish significances on heritage: scale (local, regional, state, international, etc.), importance (how important and why) and its uniqueness or representativeness. Coningham *et al.* (2006) argue that uniqueness is tied to similarity. However, the *2001 UNESCO Convention on the Protection of the Underwater Cultural Heritage*, for instance, does not cover just “of special significance”, they also include a definition according to the age. For the *World Heritage List*, on the other hand, to become heritage, the material should represent a masterpiece of human creative genius, interchange human values, be an exceptional testimony of cultural civilisation, be an outstanding example of technological development or be directly or tangibly associated with traditions, ideas or beliefs (Carman, 2002). As an idea, this dissertation would like to set out if the significance in heritage should not be awarded by comparison of material and exclusion of the repetitive ones.

In any case, all the common criteria for the significance of the heritage stated in the *Sofia Charter* (1996) of ICOMOS and 2001 UNESCO Conventions (rare aspects, yield information, demonstrating principal characteristics of a class, high degree of achievement, association to a cultural group or the life or works of persons), are based on values. However, the decisions on awarding values are bureaucratic since values are not an engagement with the past but an interpretation according to the demands of the present and of the imagined future (Graham and Howard, 2008; McDowell, 2008). Heritage has little intrinsic worth but the values placed upon the objects are seen by different lenses (Graham and Howard, 2008). The problem of awarding values is that the objects are selected and the values are created through consumption; they change from one culture to another. For this reason, Howard (2003) claims that heritage is a problem as soon as different people attach values to it.

2.2. Values

Heritage becomes heritage when it is managed and various values are awarded to the material. By assigning values to it, we give it importance. However, the process of assigning values is not that simple.

This process has been largely discussed as Wessex Archaeology (2006) reviews: according to Darvil (1995), archaeological material already had a monetary value in medieval times (as a treasure) but it also raised curiosity as legend and folklore. As the author comments, it was later, in the Renaissance, where the archaeological remains of other periods created an aesthetic curiosity but were also a proof of historical progress, they acquired historic value. In the 20th century, more values (apart from the monetary, the folklore and the historical) started to be created and the categorisation became more complicated, Darvil (1995) claims. “Values are learned and depend on cultural,

intellectual, historical and psychological frames of reference “(Lipe, 1984: 2). As a consequence, valuation is held individually but shared by communities, Darvil (2005) concludes.

Values attributed to land archaeological differ to some extent to values attributed to underwater archaeological material because of the later development of underwater archaeology. In particular, Maarleveld (2011) remarks the different needs that underwater cultural heritage users have in relation to the ones that land cultural heritage users have, for instance because of the fact that the heritage is less accessible. However, for Bator (1981) visibility and accessibility of culture can be postponed but if heritage objects are destroyed they are gone forever. As a consequence, for Bator (1981), the belief that art serves best when it is more visible is a vulgar one. The author, as a consequence, rejects the value of the heritage of being available for all, if this availability destroys it.

In addition, in land, the bases are old concepts and now the demands of the society and the economic market of heritage have changed (Maarleveld, 2011: 932), as this dissertation expects to prove. These new needs are especially noticeable on underwater cultural heritage management. Underwater cultural heritage, given it being a relatively new discipline, still faces the problem of finding its own way, its own definition, its own values and its own problems and therefore problems to be solved. As a consequence, underwater cultural heritage continuously faces new challenges. Moreover, the development of underwater archaeology raises a continual change in all these perceived values. And as a consequence of these many values, constantly in state of flux, all these significances of underwater cultural heritage have created conflicts between groups with divergent perceptions.

2.2.1. Classification of values

Different authors have tried to list and classify values. In general all of them mention the same values but classify them in different categories under different labels, as we will see below. However, since this is not a theoretical study on values, we will summarize just the main authors' theories:

Lipe (1984) distinguished four types of value: (1) *associative/symbolic* that serves as a tangible link to the past and that makes things powerful as symbols or mnemonics; (2) *aesthetic*, in relation to the properties of material (what is intrinsically appealing according to traditional standards of style and beauty); (3) *economic* as a utilitarian value which defines the material as a means, not as an end, and which includes tourism and (4) *informational* inside an intellectual context that will only give the appropriate answers if the right questions are asked. The author also added that it is not possible to preserve everything and that there is a need for continuous re-evaluation.

Darvil (1995) divided the value into (1) *use value* as a more touristic approach, based on demand or "act of consumption" (2) *option value*, the preservation of remains for future generations and (3) *existence value*, the mere factor of the existence of the resource, these last two systems more according to preservation *in situ*. According to this line of thought, Carver (1996) supports the theory of the three systems but adds (4) *academic value*, a system driven by knowledge. This value seems the same as Lipe's informational value.

Firth (1995) studied different value systems, according to which all are influenced by institutions. In addition to (1) *non archaeological values* (commercial, aesthetic, derived from faith, associated to nationality or associated to territory); (2) *archaeological values*, which Smith (2005) sees as a priority, Firth (1995) differentiates between (3)

dominant; (4) *subordinates* and (5) *co-existent values*. This identification of dominant values, subordinates and co-existent values seems to be essential for the preservation of heritage: a hierarchy of values,

Carman (2005b) also analysed the notion of values and examines how the values interact or compete, cataloguing the current value schemes into three values: (1) *accounting school of value*: market and financial value (related to Lipe's economic value or Darvil's use value); (2) *economical school of value* (where sites are evaluated for their significance or importance); and (3) *social school of value*: heritage is assessed as heritage where objects with symbolic value create a "stock of culture". Following this theory, he continues, the legal phenomenon transforms the private domain of archaeological material into a public realm, where it is necessary for the categorisation, quantification and gradation to remain. In other words, the archaeological remains would not need a division and definition of values because the inclusion of it under the law for its protection turns it into heritage and categorized it.

In the specific case of underwater cultural heritage, other theories have tried to define and classify the values although the roots of this classification lie on the general classification of values. Kaoru and Hoagland (1994) divide the types of value into (1) *use value*: derived from actual use, like visual contact with or physical use of and (2) *non-use value*: with intangible benefits because of the experience in the absence of contact. Inside the non-use values, Delgado (1988) has already differentiated between (2.1) *cultural*: the national or local consciousness; (2.2) *aesthetic*: fascination of society and (2.3) *romantic*: the emotional power. Inside "use values", Delgado includes "recreational", "monetary", "historic", "archaeological" and "anthropological".

In Table 2.1. all these theories have been organized and related for the reader's convenience:

LIPE (1984)	Associative- symbolic	Aesthetic	Economic	Informational
DARVIL (1995)	Option	Existence	Use	Academic (CARVER, 1996)
FIRTH (1995)	Non-archaeological values			Archaeological values
CARMAN (2005b)	Social school of value		Accounting school of value	Economic school of value
KAORU and HOAGLAND (1994)	Non-use value		Use value	
DELGADO (1988)	Cultural	Aesthetic	Romantic	Use value

**Table 2.1. Classification and incorporation of values.
Information compiled by author**

2.2.2. Valuation of significance and selection of values

Once that we have established the different classification of values, it is necessary to determine how significant these values are (Harrison, 2013). Figure 2.2. shows the three main concepts linked to the process of formation of heritage: value, significance and importance are dynamic and relative notions that depend on the context:

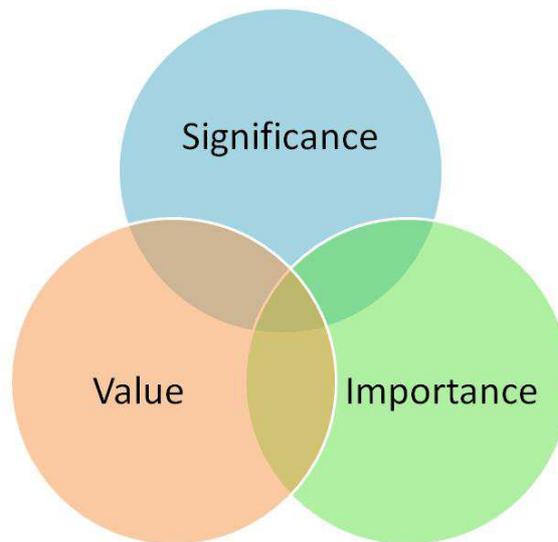


Fig 2.2. Terminological perspective: significance/importance/value

For Cockrell (1998: 86) archaeology is a destructive process, by archaeologists or by treasure hunters and this destruction, acceptable or unacceptable, is difficult to determine since many situations are in the grey area. For the author, therefore, in those situations is necessary to assign values to assess its importance and significance. Those values, according to this author, depend on:

1. Age (it is different to evaluate a vessel that sunk a year ago)
2. Provenience (depending on the place of construction, for instance)
3. Type (e.g. planes instead of vessels)
4. Legality (in international waters destruction is legal)
5. Professionalism (although who are the professionals?)
6. Artifact disposition (depending if it is public owned)

7. Profit motive (just economical?)
8. Transferring legitimacy (private archaeologists paid to oversee treasure hunters)
9. Artifacts as currency (condemned by archaeologists, as we have seen)
10. Practicality (depending on reasons such as humanitarian and environmentalist).

Lipe (1984), however, determines that values are defined by specific qualities such as authenticity, human cognition and context. For him, the process that converts a material into heritage includes (1) a cultural resource base, which are potential heritage; (2) a context, awarded by the economy, aesthetic standards, tradition or common knowledge; (3) an evaluation of this material to be considered as resource and (4) the preservation of those cultural resources through governmental policies or material such as books or museums.

For Nafziger (1999), criteria to value heritage are based on preservation or recovery of that heritage and depend only on significance, urgency and viability. Dunnell (1984) simplifies the classification and for him, there are two sets of values: humanistic (symbolic) and scientific (information). However, the humanistic are essentially political and subject to change and it is difficult to evaluate its significance. Manders *et al.* (2012) define the significance of an underwater place according to the value for past, present or future generations. However, they recognise that assessing sites is highly subjective and often determined by comparing the place against others. They also value a place for its memory value; when applied to wrecks, collective memory is on a wider scale. The aesthetic value, however, is difficult to apply to submerged heritage due to water visibility. Lastly, they remark the economic value, which for them should not determine the significance of the material but it is still important. They assess the significance by intrinsic value (importance, sensitivity, potential, information about the past, historical significance,

scientific significance, aesthetic significance, social or spiritual significance, experience significance, provenance, representativeness, rarity or uniqueness, condition and interpretative potential) or by introducing a new concept; understanding how the objects change their value (dynamics of change, processes, outcomes, significance of the change, magnitude, risk, uncertainty, significance of effects, sustainability of change, limits of acceptable change, regulation and management or indicators and monitoring).

The act of assessing significance embodies assumptions that will change (Dunnell, 1984). According to Okamura (2010), archaeologists have influences on awarding values to heritage for their abilities to research and educate. For Clark (2010), every time archaeologists or other stewardship protect a site, they are making a judgment that something is of value. And since selection and prioritisation of values is subjective each user of the heritage prioritises the values according to their needs or wishes (Manders, 2012). For instance, an archaeologist will value more the information data, a treasure hunter the economic value or a physicist department the use value.

For Okamura (2010), the value of the objects of the past is just immeasurable since it carries a different value for different people.

2.2.3. The issue of the economic value

There is a juxtaposition of different value systems in cultural heritage management (Firth, 2002). However, Dromgoole (2004) claims that the juxtaposition of commercial and cultural values does not exist in the rest of the archaeological world, only on maritime archaeology: one underwater cultural heritage site may have different values (Forrest, 2003). Economic value tends not to be considered in heritage valuation.

Many items recovered are undoubtedly of archaeological importance (Fletcher-Tomenius and Forrest (2000)). However, as the authors remind, retrieved artefacts may also have a high economic value, both intrinsic (such as gold coins) and attributed (such as a unique anchor). Of course, it may also have aesthetic and expressive value, from both a national and universal perspective, like watery graves are a reminder of a national or universal tragedy. Ready and Navrud (2002: 7) define the economic value of a cultural heritage as the value that the consumer is willing to pay, not its price.

For instance, the economic importance of the recent discovery of the vessel *Nuestra Señora de las Mercedes*, a Spanish frigate loaded with over \$500 million dollars worth of gold coin, is an economic landmark on archaeology, both terrestrial and underwater (Aznar-Gómez, 2010). In fact, it is a popular saying in Spain that “scattered around the Spanish coastline lies more gold and silver than in the vaults of the Bank of Spain”, as Aznar-Gómez (2004: 79) claims. This is because many of the sunken galleons were laden with a fortune in gold, silver and other precious materials plundered from colonies between the 16th and 19th centuries (Bass, 2005). In fact, it has been calculated that lying under the waves of the Mediterranean alone there could be sunken treasure worth \$100bn, but the real value will probably never be known (Dromgoole, 2004). Elsewhere, scattered around the globe, in the Atlantic, Caribbean and Pacific, there are far more sunken millions. However, it is still not possible to know how many wrecks are lying at the bottom of the oceans (Dromgoole, 2004). As already explained, Dromgoole estimated that a wreck should worth more than US\$10 million so it is attractive for salvage and only around 100-200 such wrecks can be found on the seabed. So far, only four or five of these vessels have been recovered. This is why shipwrecks are not only archaeological, artistic or historical items but also pieces with a possible high economic value.

The economic value of the heritage has been largely discussed, especially on the field of underwater cultural heritage, and especially in relation to treasure hunters. The main reason to the reject of treasure hunters by archaeologists is because, according to the last ones, treasure hunters are preoccupied to identify what they are specifically looking for and they are frustrated if they discover other kind of vessels (Maarleveld, 2011: 922). The author also posits other problems such as the urge for the identification the material, the collection dispersed with a short description in an auction or the donations of artifacts to those who have supported them in their endeavour. For Coroneos (2006: 120) the main problem is the timing: the more time spent on a site, the less the profit. However, in poorer countries the combination of commercial salvage and archaeology is a model (Flecker, 2002).

Villegas-Zamora (2008: 18) reminds that underwater heritage is now accessible to anyone who can afford it since the old submerged cultural sites are no longer protected by the natural inaccessibility. A concept, she states, must be remembered, namely, technology develops faster that appreciation of values. For her, the romantic idea of shipwrecks has harmed more than treasure hunters. In fact, for instance, Pickford (1994) named his book “the atlas of shipwreck and treasure”, which establishes that material on board of those shipwrecks will be treasures, not information data. However, fighting commercial value is a difficult task since, for instance, the economic value rises when an academic paper related to the material is published (Colwell-Chanthaphonh *et al.*, 2008).

According to Throckmorton (1998: 81) only 1 in 20 salvage companies has any chance of making money. He supports the idea that museums attract tourism as Carman (2002) reminds but that economies supported by tourism do not need to sign with salvor companies. In addition, for Throckmorton (1998: 82), the material with no record that has

not been intelligently excavated has no value. On the other side, he reveals, the salvage boom has cost, for instance, millions to Florida State because of the legal cases. He defends that even if there is a poor country that uses salvage for funding; if they built a museum to attract tourism the economic gain would be slower, but they would earn more. He claims that today's treasure hunters are promoted on Wall Street and the Vancouver Stock Exchange and their investors include some of the wealthiest men in the world. However, according to him, the salvage industry only benefits promoters and lawyers.

The *Nanking* ship (an almost intact wreck) was dynamited to get the Chine blue or white porcelain (Throckmorton, 1998: 82). However, as he illustrates, in the case of the Egyptian tombs, although the material is salvaged, the historical value survives because the tombs are intact, as opposed to shipwrecks. The author calculates that the most inefficient treasure hunt spent \$500,000 for 16 days at sea and that most of the investors are satisfied if included in the adventure because it is exciting. Maybe this is a solution: archaeologists present their archaeology as an adventure getting the fund not only from governments, but from private funders who are excited to pay for that adventure.

However, what will happen with cargoes worth millions of dollars are over; for instance, as in Australian waters (Coroneos, 2006: 112)? This economic value is a risk to the underwater cultural heritage. But it is not the only one and it is necessary to consider other values that had not been raised until now. Underwater cultural heritage evolves and so do its applications. New uses (like its application to scientific purposes such as experiments for dark matter) open new perspectives for its use and its value. If the only goal of categorisation of value is controlling human damaging activities, the risk to lose underwater cultural does not decrease but increases.

2.3. Ethics

In short, the process of awarding values to an object or a place for it to become heritage is an ethical process by which it is decided what is worth to be preserved for humanity to enjoy it and what can be ignored or destroyed. These decisions, as we have seen, will shape the identity, emotions and memories of all.

This dissertation will examine new ethical concerns on the management of cultural heritage that has arisen from and in the development of the underwater cultural heritage field. Although the ethical debate has largely been discussed on land heritage, as Flatman (2007) defends, these ethical dilemmas central to land archaeology have still not been solved by maritime archaeology such as ownership, treatment of human remains, the relative cultural significance of a site or the “heritage offset” (acceptable levels of damage if they provide a broader social benefit, a concept that we will discuss in the ancient lead Chapter (4.II.)). However, land heritage has also something to learn from the new debates raised from underwater heritage.

Ethics are difficult to define but is not a difficulty arising only in the heritage realm. Other disciplines have different ethical debates and some share the same ethical debates. Wylie (2003) defines ethics as a set of standards that guides action and tells you what you should do. According to Maarleveld (2011: 918) ethics is about reflection on what is good and bad and on what is right or wrong. In this regard, for the author, respecting other views is as important as being aware of one’s own position: it must not be seen as “the way things have always been done”. Maarleveld (2011: 918) also claims that ethics aspires to solve situational dilemmas. Ethics can be implicit and unspoken and different groups can have different ethics (Manders, 2012). The main problem of ethics is that they are mutable and cultural and they cannot be negotiated.

There have been three main theories on the philosophical debate around ethics: the consequentialist-based theory (something is good or bad depending on the consequences), the deontological theory (actions are intrinsically wrong or right: you have to do right irrespective of the consequences) and the virtue theory (that questions the character and addresses the qualities people should cultivate such as justice) (Colwell-Chanthaphonh *et al.*, 2008). Applied to one of the topics, for instance, the management of human remains would result, for instance, in the next affirmation: according to the consequentialist-based theory, using human remains for science and development is right because it is for a good end. However, according to the deontological theory, disturbing human remains is wrong, not matter what the consequences or the finality. According to the virtue theory, we should wonder if it is fair to disturb the human remain of an individual in order to benefit all the humanity. However, as Colwell-Chanthaphonh *et al.* (2008: 30) declare: “just because ethical problems do not have clear-cut answers does not imply that all answers are equally good”. To determine the best ones there are some basic rules, intellectual devices and sound strategies.

Archaeology and in general all sciences, are developing and moving into new realms, with fresh debates on new dilemmas (Maarleveld, 2011: 919). Ethics in archaeology matter because they have influential decisions for the future of the heritage (Colwell-Chanthaphonh *et al.*, 2008). However, we cannot forget that archaeology comes from collecting (Colwell-Chanthaphonh *et al.*, 2008): there was first an *ethos* of antiquarianism, then an *ethos* of science and finally an *ethos* of scholarship. By the mid-1950s, some agencies defined minimum standards and after the destruction by World War II it was aimed at safeguarding heritage by protocols. However, in the 1970s the illicit trade was expanded due to global networks of looters. In the 1980s there was a concern for public outreach and archaeologists had to recognise that they were but one group among

multiple publics. In the 1990s, indigenous group started to have influence on the debate on human remains, grave goods, sacred objects and objects of cultural patrimony (Colwell-Chanthaphonh *et al.*, 2008).

Ethics is about good and evil: it is about reflection on what is good and bad, right and wrong (Maarleveld, 2011: 918). Maritime archaeology has already raised a few new issues such as ownership, rights, identification or treasure hunters (Maarleveld, 2011). However, ethics in archaeology do not always refer to issues such as whether looting an archaeological site is right or wrong (Maarleveld, 2011) but to more “grey scale” decisions such as the disposition of underwater human remains for scientific investigations or the use of underwater cultural heritage to build equipment for experimental research (Maarleveld, 2011). In the latter case, the conflict is whether elements of the past should be used for experiments that aim to underpin our future. We have identified, as a sample, various ethical concerns on heritage management:

1. A recent new ethical conflict was recently uncovered when some paintings from Andy Warhol were sold by \$81, 9 millions (Sánchez, 2014). The problem is that the seller was a governmental German bank property to cover a financial gap. An administration member of the bank said “a piece of art has value when is sold”. The same situation happened in Portugal when the State wanted to auction 85 Joan Miró paintings:

[...] Christies cancelled the disputed sale of 85 paintings and other works by the 20th century Catalan master Joan Miró only hours before bidding was due to open. Tension had been building ahead of the London auction as opposition politicians and art lovers in Portugal took legal action to prevent the Lisbon government from selling off the artworks to recoup state assets sunk into the nationalisation of a failed bank (Wise, 2014 [online]).

2. Dangers to cultural heritage by development are shown, for instance, in pipeline construction, such as the BTC Pipeline Project (Paulson, 2006). This pipeline is constructed by agreement of states and private companies. It will move crude oil to market from the Caspian Sea. “The pipeline diameter will be large enough for a human to stand in its interior” (Paulson, 2006: 249). The route traverses many areas rich in cultural and archaeological heritage but this has been identified as a high priority in the planning. There is also a mitigation process and in case of finding unknown cultural heritage sites, the route can significantly change (Paulson, 2006).
3. Reyes (2014) posited this question: *what should Uruguay do with its Nazi eagle?* That illustrated the story of an eagle that was part of the stern of the *Graf Spee*, once one of the most modern battleships in the world. It was recovered by private investors and could fetch millions of dollars at auction. This eagle was a symbol of the German Third Reich with Uruguay being the rightful owner but the salvage company will get 50 percent of the profits if sold. The salvor said that “this kind of controversial piece sells well”.
4. During the process of the case of *Odyssey* against the Spanish Government in the wreck of the *Nuestra Senora de las Mercedes*, Peru and twenty-five alleged descendants demanded Spain, claiming to be the legitimate owner of the Spanish Crown’s cargo, since Peru was part of Spain in 1804. Spain claimed that Peru was Spanish territory (Aznar-Gómez, 2010).
5. Some divers have suggested using sea lions to help explore wrecks (Macdonald, 2008: 11). However, this could create a conflict with champions of animals.
6. Ethical considerations concerning the underwater cultural heritage emerge with the development on politics and on technology. In 2013, for instance, the Chinese

government asserted ownership of shipwrecks in the South China Sea (Page, 2013). An underwater archaeologist working off the coast of the Philippines was expelled by a Chinese marine-surveillance vessel since China claims that the South China Sea has been part of its territorial waters for centuries. However, the sea overlaps with claims of Vietnam, Malaysia, Brunei, Taiwan and the Philippines. Since it was one of the busiest trading routes in the world, it is full of wrecks from the last two millennia. The issue has become political since, as the vice- minister of culture of China recognises, “marine archaeology is an exercise that demonstrates national sovereignty”. The concern is the political agenda will choose the sites to research (Page, 2013). This proves that there is a close relationship between heritage management, archaeology, and national agendas (Maarleveld, 2011: 921).

7. Flatman (2009: 7) identifies other kind of ethical concerns such as involving the military-industrial organisation on underwater archaeological practices. For instance, in Spain the divers from the Spanish Navy will substitute the underwater archaeologists since they affirm to have more training under water (San Claudio, 2013). However, archaeologists claim that they are not prepared for carrying out archaeological research.
8. According to Cockrell (1998: 91) the *SS Central America* discovered in 1989 was found to have beer and soft drink cans on the seabed. The chief scientist thinks those cans can help to kill human cancer cells, so there is no interest in the treasure, but rather for humanitarian environmental reasons.
9. Some documentary makers recovered artefacts from the wreckage (Dougan, 2014) and the community in Australia accused them of disturbing the underwater graves. Some relatives claimed that “it is important for the Chinese custom that the family

gives a good grave to their ancestors” (Cheer, 2014). For them, the shipwreck is more than a shipwreck: it is a graveyard (Dougan, 2014).

10. Although dredging and hydrocarbon extraction can destroy the underwater cultural heritage, they can also create new underwater cultural heritage in the form of abandoned offshore installations (Smith and Couper, 2003).
11. Some shipwrecks are as dangerous for the high level of munitions that they still contain. Some of them contain bombs. Some jars (for instance medical) can have material that exposes archaeologists and divers (Smith and Couper, 2003).
12. Lives of the poor vessels are not well recorded and studied, as opposed to those rich and famous shipwrecks (MacLeod, 2008). As Macdonald (2008: 39) reminds, refugees from Africa sail in bots to reach Europe and poor Asian migrants to reach Australia. Lots of boats get wrecked and passengers drown. The research on this aspect is non-existent.

However, although both disciplines (land and underwater) are linked and common ethical concerns are raised, as Forrest (2003) states, underwater cultural heritage differs from terrestrial cultural heritage in a number of ways. He identifies: firstly, underwater cultural heritage is often very well preserved usually for the layers of sedimentation underwater. Secondly, in the case of shipwrecks, the wreck and its contents can be considered a "time-capsule" so all the artefacts at the site will have the same time reference, improving their contextual interpretation. This is why preservation *in situ* is of paramount concern. Thirdly, the nature of the marine environment dictates the use of techniques and tools differently from those used by archaeologists in terrestrial excavation. In fact, the equipment needed for a deep-sea excavation is extremely complex and expensive and is often unaffordable by governments. This point is of highly importance

because it establishes the reason why the economical value of underwater cultural heritage is more defensible for some groups than in the case of land archaeology. In addition, the chance of finding fortunes underwater is greater. Fourthly, underwater archaeology is a relatively new scientific discipline and it is now developing. As a consequence, the basis that we will set for this discipline on our time will be the guidelines for its preservation for the future generations. On the contrary, the main criterion for the preservation of land archaeology has already been established by previous eras. In addition, maritime archaeology has a power that is not in land archaeology: it is the possibility of common stories of immigration by sea, interracial and intergender ships, and cultural intermixing economies: there were many nations in one ship.

As a consequence, the risks threatening underwater cultural heritage preservation are new (Flatman, 2009: 5) and as a consequence they need new approaches. And although some cargos can cost US \$500 million (Villegas-Zamora, 2008: 22), as said, this economic value is only calculated when the archaeological standards are compromised by the demands of the market under a quick profit: imperative auction houses also trigger the demand. However, Coroneos (2006: 121) points out that “bad” archaeology and treasure hunting is not the only ethical issue. For Flatman (2007b: 141) to reduce ethics in maritime archaeology to treasure hunters is to misunderstand the whole concept of ethics. This is why this study will raise new dilemmas but as Tarlow (2006) announces, posing new cases is fundamental, but complex and controversial.

Accidents are trying to be minimised (Villegas-Zamora, 2008: 21) but ethics involve a continual examination. Having a code of ethical principles such as the *2001 UNESCO Convention on the Protection of the Underwater Cultural Heritage* and not reviewing it, will not solve the inevitable conflicts (Colwell-Chanthaphonh *et al.*, 2008).

2.4. Law

It is not the purpose of this dissertation to review the different legislation (national or international) in relation to underwater cultural heritage. However, this section will look at the concept of “law” applied to heritage and will sum up the main regulations (maritime and on heritage) in order to have a general picture when the case studies identify the main gaps on the legislation that opens up the ethical discussion.

Carman (1995, 1996) introduces the idea of the law as “gatekeeper”, where the material is first “marked” worthy of legal coverage, then it is “re-categorised” and given a value under the law and final valuation awards it with a new value. As a consequence, the law becomes a tool to change the moral status of the material and to change the way in which the material is understood (as we will prove in the case studies). In fact, Maarleveld (2012) claims that heritage is what society chooses to protect by law and administration. The law, as a consequence, should be seen as a vector by which moral changes are made to material (Carman, 1996). Viejo-Rose (2011: 17) argues that “changes in the appreciation of cultural heritage can be observed by looking at a selection of normative instruments developed for its protection”.

Carducci (2006: 68), on the contrary, claims that the cultural specificity of an object is intrinsic while the legal specificity is not given automatically but only if the authorities deem it appropriate. As a consequence, for the author, legal protection is only granted to objects that have been already given a cultural value. Prott and O’Keefe (1984) already discussed the relationship and controversies between heritage and law from a legal point of view, setting the legal principles before the heritage ones, as Carducci (2006) maintains.

Lixinski (2015: 211) claims that the relationship between heritage law and heritage studies is not straightforward and that heritage studies are moving towards a rejection of law because of its “definition” role on heritage. However, for the author, a rejection of heritage law would be a mistake since they both have the same interest: the protection of heritage. As a consequence, Lixinski insists on two bodies that have to be working together. And as Cheek and Keel (1984: 206) remark, “if there is a need of legal decision, the court will consider only legal issues, not cultural, religious or scientific values”.

For English Heritage (2006) the importance of shipwrecks depends on the legislative structure. However, creating a legal framework for the protection of underwater cultural heritage is a difficult task for different reasons such as the definition of the term, the decisions on what is worth preserving, the prioritisation of values and awarding a range of importance to the heritage or taking decisions for the future generation even by not knowing what future generations want.

Legal protection of underwater cultural heritage is always a combination of both international and domestic regulations. Since in general (and as a consequence of being a nascent discipline) national legislations on the protection of underwater cultural heritage are very limited (Aznar-Gómez, 2004), it is necessary to seek international arbitration to solve most disputes. Specifically, when a dispute arises from a foreign shipwreck found in international or national waters, international legislation plays the most important role (Aznar-Gómez, 2004: 24).

As Dromgoole (1999) considers each state has different economic and cultural priorities, so the rules on the protection of the heritage vary. Only with an international regime underwater cultural heritage can be protected. However, international laws are binding only upon the states that have ratified and cannot be enforced against individuals

or agencies unless they are part of national laws (Carman, 2013b). However, states have the obligation of applying domestically those international agreements (Aznar-Gómez, 2004). In addition, as Dromgoole (1999) claims, international developments in law can have positive influences in national legislations. Reasons for not ratifying an international legislation can be because of lack of resources, because they already have laws, because it challenges particular national interest, because they cannot be enforced or because there are Western approaches that cannot match other practices and beliefs. “International law today offers a seriously deficient legal framework for the protection of maritime patrimony” (Aznar-Gómez, 2004: 23). Forrest (2002) believes that the pillaging and desecration of underwater cultural heritage is the absence of a single and punitive regime.

The 2001 UNESCO Convention and the 1982 UNCLOS Convention are both products of their epochs and as a consequence they pursue different goals. The former was recently adopted when underwater remains were known to be indispensable to understand the history but the latter one was adopted when maritime powers were jealous about free navigation and as a consequence their goals were not related (Aznar-Gómez, 2004).

2.4.1. Maritime laws

Maritime laws are not thought to preserve the heritage: the sea law has private interests and the heritage is important for its public dimension (Maarleveld, 2011). However, since before the 2001 UNESCO Convention there was no international law for the protection of underwater heritage, the maritime law was applied to underwater cultural heritage. This is where the problems such as the law of finds or the law of salvage applied to underwater cultural heritage are raised. Under the law of finds, if the shipwreck is owned by someone, the salvor is entitled to compensation, not title. The property has not been abandoned. However, under the law of salvage, if the property is abandoned or if title has been lost

then the salvor is entitled to own the property. Nevertheless, abandonment must be proven (Elia, 2000). However, most conflicts with “treasure-hunters” arise because, traditionally, salvage relates to recovery of goods at sea that are considered "at peril" (usually in danger of being lost by sinking); this is the law of salvage. Treasure hunters apply this maritime principle to ancient shipwrecks and property, which is considered inherently "at risk" (Aznar-Gómez, 2010). That is, a legal provision developed to deal with emergencies (where a vessel can only be saved if it is rescued in a few precious hours) is instead applied to ships which sank decades, centuries or millennia ago. As Aznar-Gómez (2010) investigates, these laws do not apply to most countries but on the ones that do, the court is trying to consider the preservation of underwater cultural heritage. For instance, in the case of the *Titanic*, admiralty courts in the United States insisted that salvors had to comply with minimum scientific standards (Nafziger, 1999). In fact, as the author remarks, the district court determined that the salvor had exercised due diligence to keep the artifacts together.

This legislation of the sea is translated into more than 60 international conventions, relating to maritime issues since 1884, dealing with rights of navigation, working conditions of sailors, shipping, the slave trade, fisheries conservation, environmental protection, and commercial exploitation of seabed resources (Elia, 2000). However, the most important tool for legislation of the sea is the 1982 *United Nations Convention on the Law of the Sea*. Currently there are 130 parties to this Convention (not including the United States). The Convention divides the international waters into a number of zones with different legal regimes: contiguous zone, continental shelf, Exclusive Economic Zone and deep seabed (Area). According to the territorial principle every country has control over its territorial sea: it exercises sovereign immunity in its part of the sea. However, international waters are governed by the legal principle of “freedom of the high seas” (Dromgoole, 2013). Most of the shipping lanes (and as a consequence most sunken vessels) are located

in international waters, where no state can claim sovereign jurisdiction (O’Keefe, 1996). Since the territorial sea area extends only 12 nautical miles from a state’s land out to sea, there is a vast area of sea beyond this boundary with a wealth of shipwrecks technically of “no one”. International law implies that sunken state vessels (for instance, warships and vessels on government services), regardless of location, remain the property of the state owning them at the time of their sinking, unless it explicitly and formally relinquishes its ownership (Aznar-Gómez, 2010). However, on the high seas the applicable principle is the freedom of the high seas for research and recovery of shipwrecks although the cultural or historical precedence of the ship must be taken into account.

The UNCLOS 1982 Convention refers to underwater cultural heritage in only two articles: 149 and 303. The main conclusion of this agreement is that states are obliged to protect archaeological and historical objects found in the sea. However, both articles are vague and ambiguous (Forrest, 2002) and open a legal vacuum (Aznar-Gómez, 2010). Article 149 reads:

Article 149 - 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 [...]

However, for Scovazzi (2006) the main problem is Article 303 that is where the 2001 UNESCO Convention faces its main obstacle:

Article 303.1. States have the duty to protect objects of an archaeological and historical nature found at sea and shall cooperate for this purpose.

Article 303.2. In order to control traffic in such objects, the coastal State may, in applying article 33, presume that their removal from the seabed in the zone referred to in that article without its approval would result in an infringement within its territory or territorial sea of the laws and regulations referred to in that article.

For Scovazzi (2006) it seems that the sanction “removal” from the sea bed means that the object could be destroyed in the very place and would not be infracting any law. It is the case, for instance, of the case of pipelines constructors or some treasure hunters. A second problem of the article for the author is the no clarification of the regimen of the archaeological objects found on the continental shelf or the exclusive economic zone, leading to a “first come, first served” approach.

2.4.2. The 2001 UNESCO Convention on the protection of the underwater cultural heritage

On 2 January 2009 the *2001 UNESCO Convention on the Protection of the Underwater Cultural Heritage* came into force and at the time of writing (December, 2014) 47 States have ratified it (UNESCO webpage³). Maritime power such as the United Kingdom and the United States abstained or voted against the adoption of the Convention (Aznar-Gómez, 2010). Some countries have indicated that they will apply the Annex but they will not become party to the Convention (O’Keefe, 2013).

The most important conclusions of the Convention according to O’Keefe (2002) are the priority of the preservation *in situ*, the rejection of commercial recovery of underwater cultural heritage, since it is incompatible with its preservation. Forrest (2002b) remarked that this rule eliminates recognition of the economic value of this heritage and the principle of co-operation between such interest groups such as scientific institutions, archaeologists and divers. O’Keefe (1996) reminds that the 2001 UNESCO Convention was thought not to deny all wrecks to all divers (as well as among countries). However, as O’Keefe and Nafziger (1994) remembered, the Convention was motivated to avoid further spoliation of the common heritage at sea and as a consequence governments would defy the 2001

³ UNESCO Convention on the Protection of the Underwater Cultural Heritage. Legal instruments. Available at: <http://www.unesco.org/eri/la/convention.asp?KO=13520&order=alpha>

UNESCO Convention by working with commercial archaeologists (Kingsley, 2011). For this author, the elimination of this group with interest in the underwater cultural heritage on the principle of cooperation means that UNESCO put all its egg in one basket.

For other authors (Maarleveld, 2008) the Convention reconciles international maritime law with the principles of mutual respect: for the author, since heritage is of public interest needs to be accessible and of public ownership. However, it can have a private allocation. Some authors (Fletcher-Tomenius and Williams, 1999) defend that the 2001 UNESCO Convention contravenes the *European Convention on Human Rights* (1953) since every natural or legal person is entitled to the peaceful enjoyment of his possessions. They believe that the 2001 UNESCO Contention creates a presumption of abandonment of title unless the owner can rebut. However, the presumption of abandonment would mean that in maritime law there is a transfer of ownership, while on land the law implies an archaeological intervention, never a transfer of ownership. Maarleveld (2007b) concludes that it is unacceptable that all interference is development led.

However, for some jurists (O’Keefe, 2002; Aznar-Gómez, 2010; Forrest, 2002) there are also some weaknesses in the Convention: the vague definition of underwater cultural heritage; issues of ownership and abandonment; question of warships and other state-owned vessels and the determination of the geographical scope of the Convention.

The present study will also identify some ethical weaknesses. The issue of the definition of the term “underwater cultural heritage” is the most problematic, since, the term “traces of human existence” has been criticised as being too broad (O’Keefe, 2013). Article 1 of the Convention says:

“Underwater cultural heritage” means all traces of human existence having a cultural, historical or archaeological character which have been partially or totally under water, periodically or continuously, for at least 100 years [...]

Forrest (2002) claims that the terms “under water”, “culture” and “heritage” are susceptible to different interpretations. The author explores how the definition of “cultural heritage” is too general and creates problems of interpretation: if the definition has been made as a list, it would narrow the items to be protected but if it was as general as it was in the 2001 UNESCO Convention, it would to be considered just a guide. As a consequence, for the author, the definition cannot determine what underwater cultural heritage is but only what is protected under the Convention. He also introduces a new idea: that the broad definition is due to the environment in which the cultural heritage is found rather than what constitutes underwater cultural heritage (Forrest, 2002). For some authors, however, the value in the definition “having a cultural, historical or archaeological character” tries to introduce the “valuable” requirement so a bottle of Coke, for instance, will not be in the definition (Manders, 2012b). Instead, Bederman (1999) questions the term and insists that the definition is so broad that it stretches to all underwater traces of human existence and as a consequence he maintains that the Convention is “extravagant and unworkable” (Bederman, 1999; 334). He states (1999: 333) that it “falsely equates age with historical significance.”

The introduction of an age concept “under water for more than 100 years” has also been a point of discussion on the bibliography. For Forrest (2002) this justification for the age depends on the use of that age by other national and international laws and conventions, like the *1972 UNESCO Convention Concerning the Protection of the World Cultural and Natural Heritage*. The author lists other reasons: that it can protect objects of relative recent origin or that the laws of salvage cannot apply to them. However, Forrest

remarks that the 100-year limit is more an administrative pragmatism. However, there could have been other solutions. For instance, the United Kingdom does not use a minimum age of protection of the underwater cultural heritage but it is based on an assessment on their significance, and in 2012 the Netherlands followed this practice (Manders, 2012b). In conclusion, for Forrest (2002) the time period is just arbitrary and based on administrative pragmatism and should work in favour of the preservation of underwater cultural heritage. Manders *et al.* (2012) observe that although the 2001 UNESCO Convention set the limit on 100 years, the reality and managing underwater cultural heritage is that some sites must be treated more significant than others (Manders *et al.* 2012).

The problem, however, is that the definition gives a blank preservation (Aznar-Gómez, 2004). Maybe the solution would have added a clause on the Annex to include sites or objects of special relevance that have been submerged less than 100 years old, such as the *USS Arizona* or the violin of the *Titanic*. In fact, Forrest (2002) proves that in the early drafts of the Convention there was an article that recognised that the State Party could designate traces of human existence as “underwater cultural heritage” even if they had been under water for less than 100 years. However, the article was not finally included.

The 2001 UNESCO Convention does not supersede UNCLOS. In fact, Article 3 of the 2001 UNESCO Convention states that

[...] nothing in the Convention shall prejudice the rights, jurisdiction and duties of States under international law, including the United Nations Convention on the Law of the Sea. So the Convention shall be interpreted and applied in the context of an in a manner consistent with international law including the United Nations Convention on the Law of the Sea.

If the 2001 UNESCO Convention acts in the shadow of UNCLOS, and both conventions conflict in some issues, it means that the UNCLOS Convention supersedes UNESCO in detriment of the underwater cultural heritage. For instance, UNCLOS Article 303(3) specifically preserves the law of salvage in the various maritime zones to which it applies. Likewise, UNCLOS lists:

Article 311. *Relation to other conventions and international agreements.* [...].

2. This Convention shall not alter the rights and obligations of States Parties which arise from other agreements compatible with this Convention and which do not affect the enjoyment by other States Parties of their rights or the performance of their obligations under this Convention. [...]

6. States Parties agree that there shall be no amendments to the basic principle relating to the common heritage of mankind set forth in article 136 and that they shall not be party to any agreement in derogation thereof.

Despite (or as a consequence of) those two articles for Forrest (2003) it is clear that the more recent treaty (the 2001 UNESCO Convention in this case) will take precedence over the former relating the same matter. He concludes that, accordingly, no conflict may be found between the two conventions. Although this may be true, the present commentary insists that even if the two conventions do not contravene each other, it is possible to assert that they do not complement each other either and as a consequence it opens a legal vacuum that greatly threatens the protection of the underwater cultural heritage.

2.5. Conclusions

Due to the vast amount of topics covered in this dissertation, the bibliography has to be broad and try to cover everything. The chapters on the case studies will try to cover specific cases of the bibliography that has not been covered in this chapter. As Figure 2.2.

illustrates, the process from heritage to legal protection is studied through the four case studies: violin of the *Titanic*, ancient lead, watery graves and climate change. First it is explored if these case studies are considered “heritage” sites and objects, which values have been awarded as a consequence of this consideration, which ethical concerns arise for them being “heritage” and if legal instrument solve these ethical dilemmas or on the contrary, legal vacuums arise.



Fig 2.3. Diagram showing the process of heritage applied to our case studies

The entire topics covered are contingent: museums, auctions houses, heritage, values, legislation, ethics and users of the heritage. All of them are terms applied to the management of underwater cultural heritage and all of them can be applied to each one of the case studies presented in the next few pages.

Bibliography on the general topics is broad. However, bibliography on the specific cases that we are going to study is scarce and needs to be reviewed. This dissertation is located in the developing scholarship on heritage studies and heritage law and derived from this context explained in this chapter, my approach is challenging both theoretical fields by practical cases.

Chapter 3. Departing on the journey: Methodological approach

“Ethics is not about asserting one’s own viewpoint” (Maarleveld, 2011: 919). This has been the real challenge in this work: creating a scientific approach on something so biased as ethics.

In retrospect, and given my background, the topic of this dissertation was easy to choose: the main decision to focus this study on underwater cultural heritage was because the first time I saw a photo of a shipwreck lying at the bottom of the ocean made me decide that all my academic career would be devoted to this endeavour. I discovered that my interest was in the field of cultural heritage studies and after some years of research I decided that I wanted to focus my investigations on the ethical and legal implications on the management of this heritage. However, the study only gained shape as a feasible venture after reaching the audience and the approval of experts after publications and conferences.

This study is mainly framed into the field of cultural heritage studies also known as archaeological heritage management, cultural heritage management, cultural resource management or/and public archaeology (see Carman, 2002; Lipe, 1984; Muckelroy, 1998 among others). Lixinski (2015) suggests that this specific field of heritage studies rose in the second half of the twentieth century. In fact, the author distinguishes between cultural heritage management (preoccupied with conserving and protecting heritage) while heritage studies looks at the practices in their broader context, working with other disciplines, what seems a more appropriated definition of our study. As Lixinski (2015) remarks, cultural heritage management is concerned with “doing the work” of conserving, while heritage

studies comes out pondering the significance of this heritage. This is what this dissertation proposes: questioning the process where the “heritage truth” is formed. As a consequence, this study will be looking at how heritage is formed by not assuming that heritage has an intrinsic value of “heritage”.

It is also worth remarking that heritage studies can only be understood as the junction of various disciplines, such as archaeology, museology, musicology, history or anthropology, as Lixinski observes (2015). Law would comply with the task of being the regulating discipline of all these fields. Therefore, from the first moment it seemed clear that for a complete discussion of the case studies, this dissertation needed to turn into a compendium of disciplines such as underwater archaeology, law, anthropology or museology. The complexity and the different perspectives of the issues exposed required analysing and mentioning every point of view arising from the dilemmas: in addition, all of the factors and complexities of the case studies could only be understood if not only an empirical, but also a theoretical, legalistic and comparative approach, was adopted.

3.1. Empirical approach

During my education, some issues were raised on the process of formation of cultural heritage. However, the construction of this study first came out as an inductive approach: the specific case studies (raised by the news or by real situations in the practices of underwater archaeology) turned into broader generalisations and theories, such as cultural heritage management and preservation. The case studies offered regularities that we observed as patterns and allowed us to formulate some tentative hypothesis that we could explore: the violin of the *Titanic* raised an unexpected price on the auction that led us to consider the reason for such a high price; the article of the ancient lead provoked the interest of numerous journals and the forums on both archaeology and experimental

physics started to comment on the case; the year 2014 was the centenary of the beginning of the World War I and, as a consequence, the destruction of ships and planes created new underwater cultural heritage; and lastly, the numerous platforms on debates on climate change made me question what the future of underwater cultural heritage would be if climate change predictions became reality.

These case studies that were starting to be seen as “case studies” challenged an array of taken-for-granted precepts. In addition, they were both academically viable and beneficial for the development of the discipline and they did not find answers in the bibliography. I started to shape these case studies and after considering the facts, its unintended consequences on the general field of heritage studies needed to be explored. However, the success of these case studies depended on the consideration of other perspectives and on being consistent with the cultural heritage management policies sphere, as Lixinski (2015) suggested.

Every case study had to be seen, as a consequence, from the point of view of the facts and from as many perspectives as we were able to identify. The first efforts had to be dedicated to introducing the case study, explain the issue and establish the state of knowledge, as Kingsley (2011) advised. From there, two perspectives needed to be adopted: a legal perspective and an ethical perspective. And, after concluding the main dilemmas, new proposals had to be suggested. This detailed structure and study would ensure that no personal interpretations were given to the topic. To this end, the empirical approach had to guarantee scientific appreciations which could only be reached if other methodologies were adopted:

3.2. Theoretical approach

Although the case studies had been chosen basically for direct observation from an empirical approach, the tangled issues needed to be analyzed adopting a theoretical approach that would embed them into the current state of the literature. In order to reach this objective, the bibliography on policy and ethics on the management of heritage was consulted and its dependence between its management and its historical, sociological, cultural and traditional particularities was examined. However, each one of the four topics needed specific literature depending on the issue that needed to be challenged:

(1) The violin of the *Titanic per se* had not been previously discussed in the bibliography, although the ethical concerns that this chapter raised had been largely examined: questions on ownership of the heritage, manipulation of the heritage, definition of the heritage or authenticity of the heritage were recurring topics on the bibliography (Carman, 1996; Carman, 2002; Carver, 1996; Clark, 2010; Coroneos, 2006; Flatman, 2007, Lipe, 1984; Maarleveld, 2007b or Scarre and Scarre (2006) among others). However, the chapter adopts a new perspective by evaluating how these recurrent issues impact on the valuation of heritage and how the values are a domino effect: the more valuable an object as heritage, the more economic value it acquires.

(2) The use of ancient lead for particle physics experiments had not been discussed in the bibliography either, although Dromgoole (2013) briefly mentioned it in her study. The topic, however, challenged the legal instruments for its complex definition and on this examination of the legal instruments, the bibliography was broad. However, the chapter had to

explore the ethical dilemmas and issues brought about by two different fields: heritage studies and particle physics. Both points of view had to be taken into account because a dissertation in the field of cultural heritage was logically going to be biased towards the preservation of cultural heritage. However, this bias would be detrimental to the debate and the search of solutions. In order to avoid this, various experts on the field of particle physics were consulted and the Gran Sasso National Laboratory in Italy was visited. The bibliography on particle physics was also considered. This was a difficult task because of the complexity of the language of physics (e.g., Alessandrello *et al.*, 1993).

(3) Human remains as part of the underwater cultural heritage was possibly the topic most investigated in the bibliography of the four case studies. The issue had been discussed from all points of view in different disciplines: medicine, museology or archaeology were just a few of the many fields interested in the ethical and legal consequences on the management of human remains (Bryant, 2001; Cassman *et al.*, 2007; Mays, 2008; Williams, 2000; Gibbs, 2005; MacLeod, 2008). However, in the specific field of underwater cultural heritage the bibliography was narrower and allowed this study to bring new dilemmas and explore new solutions.

(4) In the case of climate change affecting the heritage, the literature on the subject was expanding but little of it pre-dated the 21st century (Daly, 2011). Surprisingly, however, the potential impact of the climate change on underwater archaeology had barely been tackled in the literature. As a consequence, a comprehensive analysis of texts of the effects of climate

change on the oceans (e.g. Fernández, 2013; Rahmstorf and Richardson, 2009 and Sheridan and Sheridan, 2013) on one hand and the preservation of materials in underwater conditions (Florian, 1987; Florian, 1987b; Hamilton, 1997; Hamilton, 2000 among others) on the other hand had to be explored. Unfortunately, the texts on preservation of materials in underwater conditions tended toward the preservation and conservation of materials after being rescued rather than toward the state of the materials still under water. In addition, little attention was given to the effect of currents on submerged heritage.

However, and after examining the most illuminating literature in this regard, it was concluded that since the study was taking the risk of “challenging” ethical implications, not only was the “academic” bibliography on heritage needed to reach unbiased conclusions but also various controversial works had to be explored and commented upon. These were works by those experts in their field who were not well acclaimed by the academic specialists but that, although some would argue that were not underwater archaeologists, were still legal users of the underwater cultural heritage, such as assessors of private companies of underwater cultural heritage exploration or CEOs of those companies (Kingsley 2001; 2003 and 2011; Stemm, 2000 and 2010 among others). This dissertation found out that although they were outside the academic and political spheres (and decisions) because they challenged the “good practices”, it was for that specific motive that they were the ones that initiated more new debates and, although controversial, offered different solutions. They were preoccupied with developing the field in contrast to the academic realm that was preoccupied with preserving the discipline. This contrast offered this study an impartial point of view.

3.3. Legal approach

If the dissertation was to challenge the ways heritage is understood and defined, then it needed to question its reliance on the law. Being from a legal background, I saw an opportunity to analyse the dilemmas not only from the point of view of cultural heritage management but its consideration into the legal realm since, as Lixinski (2015) reminded, heritage had become increasingly controlled and defined by legislation. This interdisciplinary work would allow not only identifying the dilemmas but also analysing its effects and considerations in the legislation. The result is not a legal work but a legal view of ethical aspects.

However, Lixinski (2013b: 407) observes that in international legislation in the field of heritage there is a lot of room for disagreement. In addition, as Bowens (2009) accentuated, the specific legislation related to underwater cultural heritage is a legal labyrinth. The complexity lies on the different “battles” that it is necessary to attend to, among others:

1. The jurisdiction where the law applies: deep seabed and high seas (freedom of the seas), continental shelf (can be protected if extended jurisdiction is up to 350 miles), exclusive economic zone (the uncertainty on freedom), contiguous zone (can be extended) and territorial seas (which differ from state to state).
2. The differences between salvage law and heritage law, which few conventions and commentators distinguish.
3. The questions on ownership (the salvor does not become the owner) or abandonment of ownership of underwater cultural heritage. In this regard, if they are state-owned then they can claim the ownership in international waters but not in

foreign territorial waters or if they are private they can lose ownership because of time or inactivity or lack of proof (Bowens, 2009).

4. The differences between international and national legislations (licences, penalties, exportation, rewards or scope of protection).

As previously said, this study did not intend to be a legal analysis of the legal jurisdiction on the protection of underwater cultural heritage. It aimed to be a work more focused on the ethics, management and values of underwater cultural heritage but based on the legal instrument protecting it. In this regard, an extensive published research on the protection of underwater cultural heritage was found, with an emphasis on analysing its specific legal instruments (Aznar-Gómez, 2004; Aznar- Gómez, 2010; Dromgoole, 2013; Forrest, 2002 and O’Keefe, 2002 among others). However, and after analysing, it seemed that the legal framework was being taken for granted and that the bibliography did not try to challenge it. As a consequence, one of the main aims of this dissertation was trying to fill the vacuum of what the regulations *do not* cover, not by a different interpretation of the law but from a different point of view that challenged the legislation from another perspective: the ethics. For accomplishing this goal, it seemed clear that the dissertation required a social-legal approach, although it was uncertain which specific perspective to adopt.

After an introspective debate the choice of a legal method whittled down. First of all, the perspective adopted should have an approach from what has been called “black letter” methodology or “essentialist”, which concentrated solely on the “letter of the law”. Therefore, the study would reduce the study of law to an analysis of the conventions and legal instruments concerning the underwater cultural heritage (1982 UNCLOS Convention and 2001 UNESCO Convention) and, as a consequence, the dissertation would use primary

sources as a first approach to the topic. Happily, this method brought an unexpected consequence: it brought out new questions that would challenge the underlying system.

However, this methodology only allowed the study to explore the law from a “theoretical” point of view more than “in action”. It overlooked the social implications which were deemed to be so necessary on an ethical debate. As a consequence, and in order to overcome this issue, another co-existent approach from inside the legal method was adopted: a social methodology which would allow the analysing of the impact of the law in action and the role of policymakers on its adoption. As Schiff (1976: 287) pointed out, the relationship of the law to a social situation was necessary to understand that situation:

according to a socio-legal approach, analysis of law is directly linked to the analysis of the social situation to which the law applies, and should be put into the perspective of that situation by seeing the part the law plays in the creation, maintenance and/or change of the situation.

This approach was more appealing to me, given my cultural heritage management point of view and allowed me to work not only on a “pure” law study. It also allowed the study to evaluate how the drafting of these legal instruments impacted (and changed) the preservation of underwater cultural heritage. This approach also raised other ethical concerns different to the ones considered in the first place.

A last legal approach was adopted using as secondary sources material that has been already published in relation to the law: legal commentators were essential for me to understand both the critiques and prizes that the legal instruments originated. This material was ample and allowed me to explore different points of view: although legal instruments were this study’s spinal column, the main books used as a secondary source would be

manuals, training or commentaries on these instruments by the main experts in the field, such as O’Keefe, Carman, Maarlevald, Forrest or Aznar- Gómez just to mention a few.

The result has been a mixed legal methodology with both quantitative and qualitative research. The specific ethical questions that were investigated under the legislation point of view allowed a quantitative research through a pure examination of the legal instruments. However, the search for “why” and “how” in the specific concerns allowed a qualitative research examining the references of existing literature complementing, as a consequence, the pure analysis of the law.

3.4. Comparative approach

After reviewing the literature and establishing the case studies, the dissertation had to suggest proposals for solutions on the issues considered, since the main criticism of the literature review was the lack of solutions: the literature review mainly identified “what not to do” but little thought was dedicated to providing remedies.

The solution to this question was an interdisciplinary study of other fields. Other disciplines also face ethical dilemmas and some were more pro-active than cultural heritage policy makers on looking for solutions. Comparison of underwater cultural heritage with other disciplines (other than land heritage as most of the bibliography suggested) guaranteed a view of a broader picture: underwater cultural heritage could benefit from the lessons learned in other disciplines. With this aim, papers of different fields were consulted: medical, physics, chemistry or biology commentators and scientists offered solutions to their controversies, e.g., Alessandrello *et al.* (1993); Florian (1987); North and MacLeod (1987); Pearson (1987); Magnusson (1992). Some of these solutions

could be applied to our case studies and some of those policies could be adopted by this study, which could bring benefits for the preservation of underwater cultural heritage.

This comparative approach with other sciences, however, not only benefited cultural heritage policymakers but also offered a window on cultural heritage management to other disciplines. Introducing the language of other fields into the language of cultural heritage would allow there to be a better understood topic that could have vice versa benefits. These benefits were especially noticeable in cases where cultural heritage and other sciences have to work side by side; for instance, in the use of ancient lead for particle physics experiments or in implanting preservation measures on both the natural and cultural heritage due to future climate change. Allowing the understanding by other disciplines guarantees not only respect towards yours but also offers you a new point of view full of possibilities.

Unifying these various approaches has led to the conclusions that every case study has reached. In addition, the solid background of the literature review has allowed the proposals at the end of each chapter to come out naturally. First, it seemed logical to allude to laws that I knew to offer a solution in the case of the violin of the *Titanic*: a private object with a heritage (public) value. Second, the discussions with colleagues in other fields presented me with the case of the animals' protocol that we will explore. Third, the presentation of papers on human remains in various conferences generated a debate where the shipwrecks with no remains of human bodies were the most discussed issue. Finally, the proliferation of forums for climate change agendas with special attention to oceans but not attention whatsoever to underwater cultural heritage offered me an old solution: combining forces.

The next chapters, as a consequence, are the product of combined methodological approaches that aim to offer solutions that can be taken into account for the future of the management of cultural heritage.

**Chapter 4. The battle:
four Case Studies**

I. Valorisation:
the violin of the *Titanic*

I. Valorisation: the violin of the *Titanic*

A common object that has gained prestige as heritage through a process of recognition of various values by different stakeholders: an historical value by the museum, an emotional value by the media and an economic value (gained because the other values exist) by the auction market.

I.1. Introduction

The story of the *Titanic* is well known: the White Star Line vessel RMS *Titanic* collided with an iceberg on the night of 14-15 April 1912 in the North Atlantic Ocean; 1,500 persons perished (Aznar-Gómez and Varmer, 2012). Only 340 bodies were rescued back in 1912, and as a consequence 1,160 might still remain at the bottom of the ocean (Willis, 2008, 112).

Wallace Hartley was one of the victims (Figure 4.I.1). He was an English violinist assigned as a bandmaster of the *Titanic* in 1912.



Fig 4.I.1. Wallace Hartley, violinist of the *Titanic*.
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According to some sources, Wallace Hartley played his violin (“the violin”) to help calm passengers while the *Titanic* was sinking:

One famous tale of stoic heroism on board the *Titanic* was that the ship’s band did not abandon their instruments and take to the rafts but rather, recognising the importance of music in maintaining an air of calm, continued playing even as the water lapped over the bow (Willis, 2008: 112).

Wallace played his favourite hymn “Nearer, My God, to thee”, a 19th century Christian hymn, with his eight members band. After playing, he placed the violin into a leather case and strapped it to his back (Telegraph Reporters, 2013). The violin was still strapped to him when his body was recovered as number 224 on April 25th 1912⁴, days after the sinking. Figure 4.I.2 shows the current preservation of the violin and the case.



Fig 4.I.2. The violin of the *Titanic*.
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⁴ Henry Aldridge & Son website. Available at: <http://www.henry-aldridge.co.uk/>

It was his fiancée, Maria Robinson, who gave him the violin as a gift and engraved “For Wallace on the occasion of our engagement, from Maria” on a silver hallmark on the tail of the violin⁵. After the sinking, she requested its return because of the emotional connection (Telegraph Reporters, 2013). It was 2006 when it was discovered in an attic: after the sinking, the violin was indeed returned to Hartley’s fiancée. After she died, her sister gave it to the Bridlington Salvation Army, who then gave the violin to a local music and violin teacher. He got married to a woman, who was the mother of the last owner of the violin before it was sold (Telegraph Reporters, 2013). Through all these owners the violin could not be played, since the instrument still today has two long cracks from the water moisture (which would not allow it to be played) and only two original strings of the four.

This chapter is aimed at asking questions about the significance of this particular violin and consequently the way it should be treated as part of an universal history and if it should be protected, for instance under the 2001 UNESCO Convention and exhibited to the public. This chapter also considers ethical aspects of how an inexpensive violin has become heritage and an auctioned object. We will also look at the ethics around the preservation, conservation and transformation of the violin: if the effect of hearing the sound of the violin would be more beneficial than only being able to see the violin since its sound can be in this case part of a collective memory. As Graham and Howard (2008: 4) observe, music is not heritage but may become so. In this regard, Smith (2006) concludes that the real sense of heritage is when our emotions and sense of self are truly engaged. Often, when we hear something, it triggers our feeling and thinking. In this specific case it might be difficult to identify the sound of the violin but just by knowing that the sound is that from the violin that played on in the moments of distress, i.e. the sinking of the ship,

⁵ Henry Aldridge & Son website. Available at: <http://www.henry-aldridge.co.uk/>

could change the way it is felt and the emotional attachment with that sound may become more intense. As explained in the Literature Review (Chapter 2) and remembered by McDowell (2008: 50), heritage creation is a dynamic process: people reinvent signs and symbols to articulate heritage and as icons of identity (McDowell, 2008: 40). The attachment with the story through sound could make the visitor feel a sense of identification with an archaeological sound, an object and a part of the history. The sound of the *Titanic* violin would be part of a collective or even better a prosthetic memory inherited through story-telling and continuous communal interest.

I.2. Issue

One of the most expensive violins in history, the *Lady Tennant Stradivarius*, was sold by its private owner through Christie's New York in April 2005 for US \$2.03 million⁶. Its main quality was its sound. *Stradivarius* violins are known for their brilliant sound quality: they produce both expressive sound and high volume. Its sound is usually the main value that is ascribed to a violin⁷. Sound spreads emotions. Other values, such as an aesthetic quality or scientific significance, are not what violinists are looking for when playing a violin. As a consequence, the economic value attached to those instruments appears to be mainly based on their sound. The fact that they are old, rare and have a name also bestows them a value, but the economic value would not be so high if they could not be played. In fact, not many *Stradivarius* violins are kept in museums, and those that are, can be borrowed by renowned violinists (*Stradivarius Trust*, 2001). In this regard, the violins

⁶ Forbes website. Available at: http://www.forbes.com/2006/04/10/expensive-musical-instruments_cx_mr_0411musicinst.html.

⁷ There are many theories on the quality of the *Stradivarius* sound. This may be due to 17th Century radiation included in the wood, the varnish that has been used or simply because of the way the violins have been built. In a recent study, however, scientists conclude that there is no difference in the quality of sound between the *Stradivarius* violins and those recently built. See <http://content.time.com/time/health/article/0,8599,1878425,00.html> ; <http://www.bbc.com/news/entertainment-arts-13856203> ; <http://blogs.discovermagazine.com/notrocketscience/2012/01/02/violinists-cant-tell-the-difference-between-stradivarius-violins-and-new-ones/>

belong to private organizations but it is their sound that is shared for the benefit of humankind.

The *Titanic* violin was sold for \$1.7 million on the 19th October 2013 (Nyberg and Carter, 2013) in an auction in Wiltshire, England hosted by the auction house *Henry Aldridge & Son*. The price was almost as high as the most expensive violin ever sold, the mentioned *Lady Tennant Stradivarius*. However, the difference between the Stradivarius and the *Titanic* violin is that the latter is an inexpensive German factory-made violin which would not have had a high special quality sound, the main feature of an expensive violin. However, it reached such a high price because it played the last piece of music heard by many of the people on board the *Titanic* and as a consequence it has, as part of the story, gained a mythical status. In fact, according to a poll released by the Marist College and Sea Research Foundation⁸ to the question of *What do you find most interesting about the history of the Titanic*, the 37% answered with the story of how passengers and crew handled the disaster. Other answers were the fact that the ship was unsinkable (29%), the artefacts (15%) or the grandeur (11%).

Through its management and interpretation, the object has become heritage (Smith, 2006). And since it has reached the status of being “heritage” (historical and emotional values), it has also increased the economic value. This progression from an ordinary object to an object with a high economic value only because of its historical and emotional value and its lack of protection by the law due to the absence of a consideration of values in the legislation is the main argument of this chapter and will be discussed below.

⁸ The Legacy of the Titanic: Over a Century Later. Marist Poll and Sea Research Foundation. 2013. Available at http://www.searesearch.org/sites/searesearch.org/files/Sea%20Research%20Foundation-Marist%20Poll_Titanic%20Report_March%202013.pdf

I.3. State of knowledge

The wreck of the *Titanic* was discovered in 1985 by a joint French-U.S. expedition led by Jean Luc Michel of the French Research Institute for Exploration of the Sea (IFREMER) and Robert Ballard of the Woods Hole Oceanographic Institution. In 1987, Titanic Ventures Inc. and IFREMER returned to the site and salvaged some artefacts. It has been estimated that less than 1% of the total number of artefacts at the site have been recovered (Aznar-Gómez and Varmer, 2012). However, the salvors of the *Titanic* are forbidden by law to sell anything (Bass, 2005).

The *Titanic* and its cargo are now under the umbrella of the 2001 UNESCO *Convention on the Protection of the Underwater Cultural Heritage*, since they have now been underwater for at least 100 years (UNESCO, 2001). Even more, the wreck has become a symbol of the Convention (Guerin, 2012). In this regard, not only the objects, but also the site itself are considered underwater cultural heritage (Boesten, 2002).

However, the violin is a different case since it was recovered only 10 days after the ship sunk⁹. As a consequence, it has not been under water for more than 100 years and furthermore was not illegally salvaged. Being 100 years under water is what the rules of the 2001 UNESCO Convention demands for inclusion, even if the ship to which it is related has been under water for that long. Therefore, even if the violin could be considered *cultural heritage* strongly attached to an underwater cultural heritage site, from a number of different perspectives which will be discussed below, it is not *underwater cultural heritage*, according to the definition of the 2001 UNESCO Convention. This questions the treatment of those objects belonging to the same event, even the same archaeological site (here the ship), and even the same collection, but which were salvaged a long time ago.

⁹ Henry Aldridge & Son website. Available at: <http://www.henry-aldridge.co.uk/>

The result of this ambiguity leaves objects that have not been under water that long, but that are part of the shipwreck complex unprotected, as it is the case of the violin that was being played while the *Titanic* was sinking, which gained a symbolic status through time, but that it is now in hands of a private collector.

However, according to the poll by the *Marist College and Sea Research Foundation*¹⁰ to the question *Do you strongly agree, agree, disagree, or strongly disagree that the site of the Titanic should be designated as an international memorial?* 54% agreed and 27% disagreed. And what is perhaps more significant, six in ten Americans (60%) think that artifacts taken from the *Titanic* should not be allowed to be auctioned.

1.4. Legal perspective

The *Titanic* was a British vessel that sank beyond the jurisdiction of even the nearest coastal state, Canada (Nafziger, 1999). There are only four states (Canada, France, the United Kingdom, and the United States) with a *clear, indisputable link with the Titanic, its crew and appurtenances, and the passengers aboard* (Aznar-Gómez and Varmer, 2012).

The problem is that the wreck of the *Titanic*, even though a symbol of the 2001 UNESCO Convention and under water for more than 100 years, is not automatically protected by the Convention, although it falls under its umbrella. To achieve this, the associated countries (or at least some of them) need to ratify the Convention. According to Aznar-Gómez and Varmer (2012: 101)

[...] problems arise when dealing with the application of the Convention *ratione personæ* as Canada, the United Kingdom and the United States are not all parties to

¹⁰ The Legacy of the Titanic: Over a Century Later. Marist Poll and Sea Research Foundation. 2013. Available at: http://www.searesearch.org/sites/searesearch.org/files/Sea%20Research%20Foundation-Marist%20Poll_Titanic%20Report_March%202013.pdf

the Convention. France ratified in February 2013 and Canada confirmed its intention to ratify the Convention, when voting in favour of its adoption. However, both the United Kingdom and the United States have expressed concerns about the Convention and will not likely ratify the Convention unless and until those concerns are addressed.

As a consequence, if the objects belonging to the site, and the site itself, are to be preserved, it is necessary to look at other conventions and agreements that the relevant countries involved with the *Titanic* are party to:

1. UNESCO Conventions: the various UNESCO conventions deal with all particular aspects of heritage, such as intangible, underwater, archaeological or natural heritage (Carman, 2013); some of these conventions are overlapping or can be combined. However, these international treaties are not law but set of agreements between nations (Carman, 2013) and as consequence cannot be enforced against individuals or agencies such as auction houses. In this regard, and although the violin may not be considered as being protected under the 2001 UNESCO Convention, under the *1970 UNESCO Convention on the Means of Prohibition and Preventing the Illicit Import, Export and Transfer of Ownership of Cultural Property* the violin is defined as *cultural property* since it falls into the category of section (k) “articles of furniture more than one hundred years old and old musical instruments”. The violin is more than 100 years old, although it has not been under water more than 100 years that is what excludes it from the umbrella of the 2001 UNESCO Convention. As a consequence, the transfer of ownership through its sale in an auction house would not be permitted under Article 3 of the 1970 UNESCO Convention:

The import, export or transfer of ownership of cultural property effected contrary to the provisions adopted under this Convention by the States Parties thereto, shall be illicit.

All four states with the verifiable link with the *Titanic* are parties of the 1970 Convention¹¹. It is also worth mentioning the *1972 UNESCO Convention convening the Protection of the World Cultural and Natural Heritage* which deals with natural and cultural heritage sites of outstanding universal value (Dingli, 2006). However, the issue is the same: the dilemma of declaring the violin of “universal value”.

2. Other articles in the 2001 UNESCO Convention: the 2001 UNESCO Convention encourages the signatories to keep the collections together. Article 18.4 states:

A State Party which has seized underwater cultural heritage shall ensure that its disposition be for the public benefit, taking into account the need for conservation and research; the need for reassembly of a dispersed collection; the need for public access, exhibition and education; and the interests of any State with a verifiable link, especially a cultural, historical or archaeological link, in respect of the underwater cultural heritage concerned.

However, the Convention does not state if “dispersed collection” means *only* those objects that have been under water for more than 100 years and are, as a consequence, under the umbrella of the Convention and “defined” as underwater cultural heritage.

Article 14.4 of the 2001 UNESCO Convention also states that “a State Party [...] shall ensure the need for re-assembly of a dispersed collection” and Rules 33 and 34 express that the material raised shall be kept together and intact as a collection “as far as possible” (O’Keefe, 2002). The debate is if these articles include only items of the collection which *are* underwater cultural heritage as defined in the Convention of 2001 or whether it is a broader term and includes the re-assembly of any object, part of the site or event, and not only those considered to

¹¹ State Parties to the 1970 UNESCO Convention by Regio. Available at: <http://dosfan.lib.uic.edu/usia/E-USIA/education/culprop/unesco02.html>

be protected under the rules of the Convention as a collection which would include, in this case, the violin¹².

Anyway, and as O’Keefe (2002) confirms, the main issue is that the 2001 UNESCO Convention is not retroactive, so it does not apply to events which took place before it entered into force. As a consequence, these articles would not be applicable to the recovery of the *Titanic*.

3. Other international agreements: the *European Convention on the Protection of the Archaeological Heritage* (Valetta Treaty, 1992). The Agreement defines archaeological heritage in its Article 1:

1. The aim of this (revised) Convention is to protect the archaeological heritage as a source of the European collective memory and as an instrument for historical and scientific study.
2. To this end shall be considered to be elements of the archaeological heritage all remains and objects and any other traces of mankind from past epochs:

¹² It is worth mentioning that, in this regard, the four interested countries also consider the reassembly of collections in their legislation: (1) US Federal Regulation states that an artifact collection “should not be subdivided and stored at more than a single repository” (36 Code of Federal Regulations 79.6 (b) (2)) Available at: <http://www.ecfr.gov/cgi-bin/ECFR?page=browse>; (2) The Guide to the Management of Movable Heritage Assets in Canada, Government of Canada (Guide to the Management of Movable Heritage Assets. Available at: <http://www.tbs-sct.gc.ca/pol/doc-eng.aspx?section=text&id=13872> emphasizes the need to “keep heritage items in their original place and context whenever possible or, if this is not possible, keep the items in managed collections”; (3) France is also a country with an interest in the shipwreck, since the Liner called at Cherbourg (France). Under French legislation, there is no age criterion in the definition, but includes “all assets of prehistoric, archaeological or historic interest” (Law No. 89-874 of 1 December relating to maritime cultural assets (*Journal officiel de la République Française*, 5 December 1989, 15033-15034). Available at: <http://www.un.org/depts/los/LEGISLATIONANDTREATIES/STATEFILES/FRA> However, a court decision (*Tribunal correctionnel*, Brest, 25 October 1994, *Ministere public*, p. 10, unreported) defined maritime cultural assets as “remains of a glorious and tragic event in the history of our country”. In this sense, the violin of the *Titanic* would fall into the terms of this legislation; (4) In the UK, Southampton was the departure point of the *Titanic*, the Protection of Wrecks Act 1973 (Protection of Wrecks Act, 1973, c. 33) includes any objects contained or formerly contained in [a vessel of historical, archaeological or artistic importance]. The violin was formerly contained and as a consequence, falls within the scope of this legislation. Members at the International Congress of Maritime Museums in 1993, including the National Maritime Museum, Greenwich, agreed that “artefacts from underwater sites are integral parts of an archaeological finds complex which should stay together for research and display” (Hosty, 1995).

- i. the preservation and study of which help to retrace the history of mankind [...]
- ii. which are located in any area within the jurisdiction of the Parties.

3. The archaeological heritage shall include structures, constructions, groups of buildings, developed sites, moveable objects, monuments of other kinds as well as their context, whether situated on land or under water.

The broad definition “as a source of the European collective memory” generates debate on the various values of the violin which we will tackle later. However, the violin retraces the history of mankind, it is a moveable object and it is situated now on land. France and the United Kingdom are parties to this Convention.

4. Specific agreement: at the present time, the subject of the *Titanic* is waiting for an agreement to come into force between the four countries. The UK ratified the agreement in 2003 and the United States in 2004 (Varmer, 2006). It is worth remarking that in the agreement, project authorizations are necessary for entry into the hull so human remains are not disturbed and any activity aimed at the artifacts outside the hull are also regulated (Varmer, 2006).

At least two countries had to ratify the Agreement for it to take effect (Agreement, 2000). Article 2 of the Agreement states that:

RMS Titanic shall be recognised as:

- (a) a memorial to those men, women and children who perished and whose remains should be given appropriate respect, in accordance with this Agreement; and
- (b) an underwater historical wreck of exceptional international importance having a unique symbolic value.

However, the Agreement only applies to:

[...] all artefacts recovered from *RMS Titanic* after entry into force of this Agreement
[...] (Article 3)

Despite this article which gives the Agreement a non-retrospective character, this chapter poses the dilemma of if the violin, due to the fact that it is (a) a memorial to those who perished which deserves appropriate respect and (b) may have the highest symbolic value of all the items associated with the *Titanic*, should have been preserved as an exception under the Agreement, even though the collection of artefacts rescued in the first excavation have already been dispersed to various museums and private collectors.

Deciding if the violin should have been protected for having a universal value is, once again, a consideration of the various values. As already mentioned, Carman (1996) states an object becomes “heritage” when it is covered by a body of law. However, in this case, the violin has transformed from transient (an inexpensive violin) to durable (a \$1.7 million symbolic violin) just for its recognition as a symbolic object by the community (Thompson, 1979) despite not being acknowledged by the law. As a consequence, and although according to Carman (2013) law plays an important role in the definition, identification, preservation and protection of the heritage, the law has failed to protect an already heritage object because of a gap in its definition.

1.5. Ethical dilemmas on valorisation

This section of the chapter will be aimed at examining how the violin has transformed from being an object without value to a piece of heritage of such an economic value and the implications of this transformation. As Smith (2006) observes, heritage is about the negotiation of values. In fact, the values of the violin have changed before, during and after the sinking.

The violin is often recognised as the main symbol of the *Titanic*'s tragedy. Auctioneer Alan Aldridge described the violin as the "rarest and most iconic" piece of *Titanic* memorabilia (Kennedy, 2013). Its meaning is so strong that some survivors affirmed having heard the hymn being played (Howells, 1999: 128) while they tried to stay alive. Thus, some of the value ascribed to the violin comes from its uniqueness, representativeness and historical significance, and were the initial reasons for having the violin exhibited at *the Titanic Branson* and *Titanic Pigeon Forge* in the United States and after that at the *Titanic Belfast Museum*. Other values ascribed to the violin are being a symbol of faith and survival enhanced by the media and the cinema, as we will see below. However, and as a consequence of these previous values, it is the economic value that has been paramount in the sale of the violin to an anonymous private British buyer: the guide price for the violin was \$500,000 and finally reached \$1.7 million¹³. The question is if this economic value would have been so high if the media and the museums had not enhanced the other values of the violin.

Hooper-Greenhill (1992) affirms that in the same way advertisements select and manipulate images, heritage managers can manipulate objects to create relationships and associations and create identities. As Smith (2006) subscribes, heritage is the use of the past to construct memories and identities. The economic value of the violin has been subjected to this interpretation as an historical and emotional symbol. As said, the wreck of the *Titanic* was discovered in 1985, when some objects were retrieved. Cameron's film of the *Titanic* was released in 1997¹⁴. Finally, the violin was sold by an auction house in 2014. As a consequence, and in this process, we have distinguished three groups that have subjected the violin to interpretation and as a consequence have enhanced the different values (Figure 4.I.3) : (1) museum curators, that have worked for the public benefit of the

¹³ Henry Aldridge & Son website. Available at: <http://www.henry-aldridge.co.uk/>

¹⁴*Titanic*, 1997. [Film]. Directed by James Cameron. USA: Paramount Pictures.

heritage, (2) movies and media that has given a prosthetic value to the violin, and (3) auction managers taking advantage of the valuation of the violin by the museums and the media, have given it an economic value and sold it to a private owner.

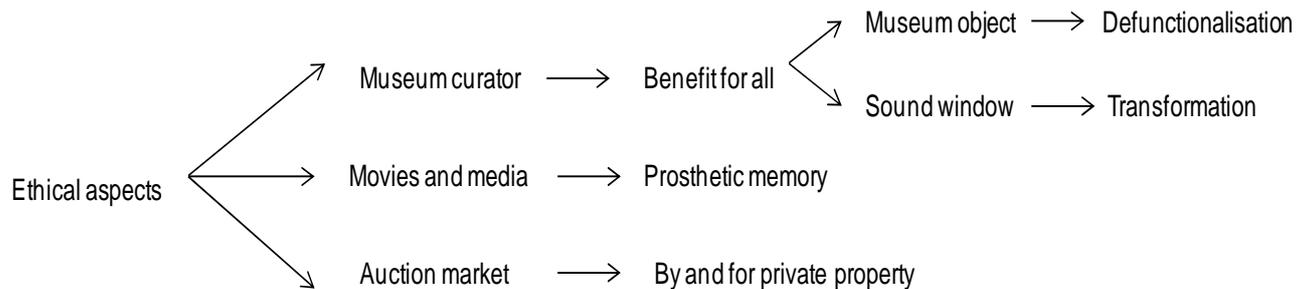


Fig 4.I.3. Organization of the ethical dilemmas of the chapter

1.5.1. Museum curators: values for the benefit of all

McLean (2008: 283) believes that museums are the most fertile heritage area in which to undertake valuation work since the display is represented and interpreted and the heritage is negotiated through the exhibition itself. In this sense, for instance, the difference between treating an object as a museum object or as a funerary object will change the way the spectator will feel when getting closer to the object (Hooper-Greenhill, 1992). It will manipulate the spectators' approach to the object because as Holtorf (2010) defends, heritage is not about education about the past but story telling in the present.

Howard (2003) asserts that museums use temporary exhibitions to tell different stories. Nevertheless, for Hooper-Greenhill (2000) museums face this big challenge: the *reconceptualisation* of the museum/audience relationship through the collections that the

museum holds, since individual objects have ambiguous meaning. The author asserts that here is not only one way to interpret objects and as a consequence, to understand the process of heritage and its interpretation it is necessary to study the relationship between the *seen* (object) and the *seer* (observer). In short, interpretation of the violin can be considered from the point of view of the curator (how objects are displayed alongside images and texts) and from the point of view of the visitor (its own knowledge and with his feelings). The choice of curators to produce the feelings is not accidental, but it has been proved to be effective (Aplin, 2002). The question is if leaving the objective information about the object and for the visitor to interpret would be less attractive.

Although of no scientific interest, I would like to present an example that can help understand this concept. Recently, in a Contemporary Art course I taught (sometimes a difficult subject to teach because first you have to convince that Contemporary Art *is* art) I showed a painting by a Spanish artist, Manuel Millares, named *Fallen Figure 1*, painted in 1970 (Figure 4.I.4.).



Fig 4.I.4. Fallen Figure 1
©[Museo Reina Sofia, Madrid]. Source: author's photo

The painting did not have any effect on the students (all adults) who claimed no identification with the painting, even when I told them the title of the piece. However, when I explained that the clothes that were used on the painting to represent the figure were the clothes used to wrap the dead people in their region, suddenly the painting was given a fresh meaning, the students felt a connection with it and for most of them it became one of the most emotional and representative paintings.

This random example proves the opportunity that the curator or owner of an object has to manipulate the public connection with the object: heritage gain meaning through interpretation and there are more than one possible interpretations (Aplin, 2002). The result is that heritage is not only about the past or about material things, but it is a “process of engagement, an act of communication and an act of making meaning in and for the present” (Smith, 2006): for the author, objects are useful just for making stories tangible. As a consequence, and as Lipe (1984) suggests, our present-day understanding of the violin (or de Millares’ painting) is conditioned by new information extrinsic to the resource itself. Those who interpret are responsible for the message, the content and how the material is presented (Aplin, 2007).

As a consequence, interpretation can distort the information and can be caught up in the manipulation of history (Lipe, 1984). Since a museum focuses on the past it can fall into the trap of romanticizing that past. However, museums can avoid manipulating stories by being honest about the past and by balancing the past with images from the present (Pitchford, 2008). If the violin is treated as a funerary object, the public will identify themselves with the history and story of the object. If treated as a museum (or a gallery) object, the visitor will look at it as a piece of art. This reinforces the idea that all heritages

are intangible (Smith, 2006). Because heritage is a process, and not an object, this process includes bestowing the object with a value and a meaning.

The *Titanic* has become an icon all around the world due to its proximity to mankind through emotions. The fact that the public has been able to understand the pre-wreck nature of the ship, as well as behaviour during the sinking and the subsequent salvage (Gibbs, 2006) has been crucial for the emotional association with the shipwreck. However, emotions are a dangerous measuring stick with which to award an object with a value (Smith, 2006). It depends on how much we want to insist on the emotional or spiritual value.

Connected to this emotion is the heroic role of the band of the *Titanic*, which played on while the ship sank. The violin and the sound of the violin in combination with the melody originally played are prominent symbols. However, deciding (1) if it is the violin *per se* (museum object) or (2) if it is the music played by the violin (sound window), that would generate the emotions and the attachment on the spectator will have two different outcomes:

a) if it is the violin that needs to be preserved, the violin will suffer a process of a defunctionalisation, to be considered an untouched museum object and not a violin whose main feature is to be played. However,

b) if it is its sound that needs to be preserved, the violin needs to suffer a process of transformation, since its current condition does not allow it to be played.

1.5.1.1. A museum object: defunctionalisation

The violin is *not* an archaeological object and it does not provide information about the archaeological context. It does not add any new facts about the site since it was never part of it. However, although not part of the archaeological context, the violin is part of the overall *Titanic* collection and a visual window to the past. To preserve it, from an aesthetic history of art point of view, as a museum object, it should remain as it is. The violin may have already ‘suffered’ (minor) stabilisation treatment to enable it to be sold in an auction and may therefore have been transformed from its original state into that of conservation.¹⁵ However, the usual policies on standards of conservation tend to leave the object as authentic¹⁶ and untouched as possible:

The traditional definition of the role of the conservator involves the examination, conservation and preservation of cultural heritage using any methods that prove effective in keeping that property in as close to its original condition as possible, for as long as possible [...]. Critical points are those of minimal intervention and reversibility, though the ideal of the latter is not always achievable in reality (Viduka 2012: 3).

The violin would be preserved as a window to the past: look and remember, but do not touch (Manders *et al.*, 2012).

In this case, the violin would be defunctionalised. It would not act anymore as a generator of sound but would be re-evaluated and assigned as an aesthetic object. Lipe (1984) affirms that the value of a cultural item may not be identical to its resource value in

¹⁵By original state we mean the state in which it was when it was found again in 2006.

¹⁶It is beyond the scope of this article to fully engage in a discussion of authenticity and the attempts made to understand it over the years. In 1994, the Japanese government organized with UNESCO, ICCROM and ICOMOS the Nara Conference on authenticity drafted by 45 representatives from 28 countries. Its main conclusion is that the term “authenticity” differs from culture to culture and that “it depends on the nature of cultural heritage, its cultural context and its evolution through time” (Article 13, *Nara document on Authenticity*, 1993). However, and agreeing with Howard (2003) there are different kinds of authenticity: for instance of creator, material, function, concept, history, ensemble, context, experience and style. In this regard the violin would always stand as “authentic”, for one reason or the other.

its original context. However, some relationship to the original context has to be retained. A violin is not just an object; it is not just an artefact: it is a musical instrument, the function of which is generating music. Its main value is often intangible and symbolic. If the object is defunctionalised by not playing and just exhibiting it, it may lose meaning, significance and, as a consequence, an important part of its value.

1.5.1.2. A sound window: transformation

Musical instruments are the only items found by archaeologists that can help us understand the sounds of the past. For Hooper-Greenhill (2000) knowledge of an object includes handling, smelling, hearing and seeing. However, hearing is one of the five senses (sight, hearing, taste, smell and touch) rarely experienced in archaeology. When we have it is rare and unique.¹⁷ In fact, as far as we know, only a few other violins or parts of violins have been found in shipwrecks: like the two (and a bow) on the *Mary Rose* (1545), four on the *Kronan* (1676) and three on the *Maple Leaf* (1864) (Montagu, 2005; Yllana, 2013). However, these instruments, in their present state, cannot be played.

The issue is that if we consider the object to have a sonority value, then the object has to be played, and as a consequence must pass through severe *Luthier*¹⁸ modifications, which may require an almost entire reconstruction, such as changing the strings, the pegs, refinishing the wood and possibly changing the tailpiece where the fiancées' inscription is located. As Figure 4.I.5. illustrates, some strings are missing, there is no bridge and two cracks are visible on the sound box . However, any modification of the violin, even the small bridge that holds the strings, would create a change of sound (Yano and Minato, 1992).

¹⁷ A sixteen century trumpet was excavated from the *Scheurrak SOI* wreck in the Netherlands. A replica has been made which gave scientists the opportunity to investigate its sound and the different tones produced by the several mouth pieces discovered (Van der Heide, 1994).

¹⁸ *Luthier* is a craftsman who makes and repairs stringed instruments.

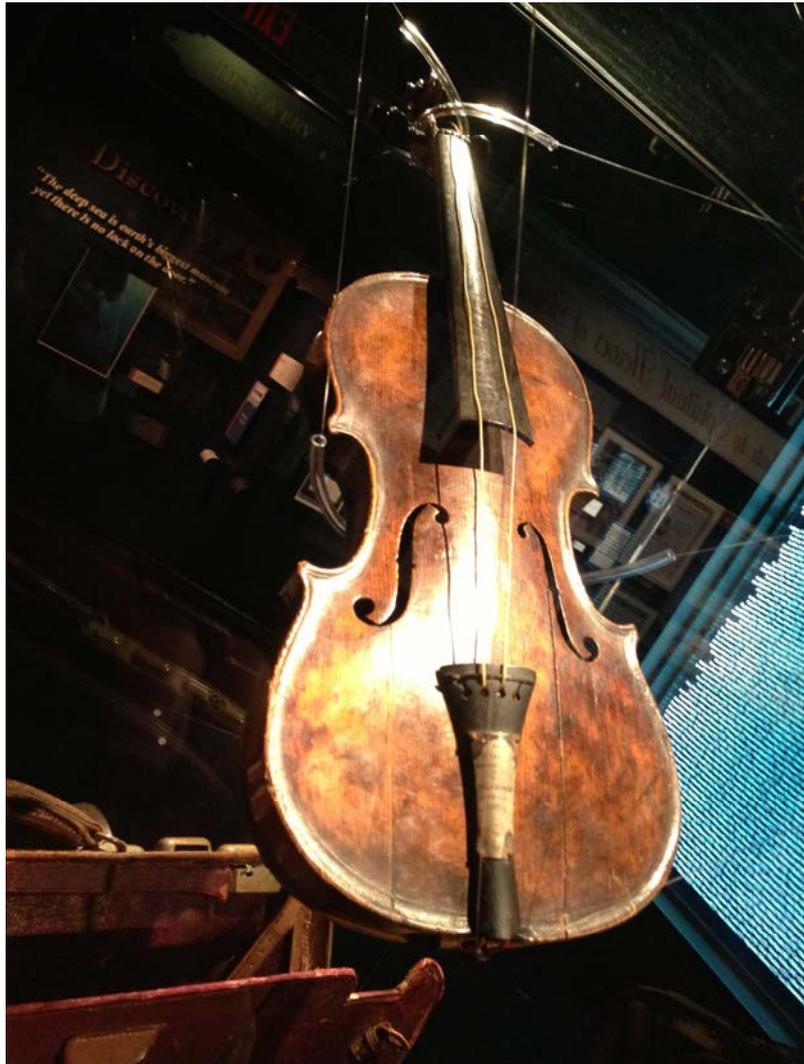


Fig 4.I.5. Current state of preservation of the violin of the *Titanic* ©[Titanic Attraction]. Reproduced by permission of Titanic Attraction. Permission to reuse must be obtained from the rights holder.

However, restoring the object would emphasise its value through music, which is rare in a cultural object. Music can play a role in individual memory. It can inspire past situations, atmospheres and emotions. But it also can inspire a feeling of collective identity (Stachel, 2006). Being able to play "Nearer, My God, to Thee" again with that violin, the last song played on the violin while the *Titanic* was sinking, could be a tribute to the victims of the shipwreck (according to Stachel (2006) the choice of a piece plays a role in stimulating a specific feeling). If there were survivors, listening again to the same melody

from the same violin would have generated countless emotions. Would these emotions be the same when playing the same melody with a different violin?

It may be that it is not the sound of the violin but the melody played (a sad melody, but still a melody of hope) the key point in generating emotions. Would this be more if this specific music were to be played by the real violin that played the music in the original event? The question is then, if playing the same song with a different violin would provoke the same level of emotions. Knowing the authenticity of the violin, knowing that the violin is the one that played on board of the *Titanic*, would it change the level of emotion? Would playing this melody on the original violin add more value to it? It is the same case as the painting already mentioned with the clothes of the dead. The question is if this would justify the severe modification that the violin would require. The public benefit would have to be considered.

1.5.2. Movies and media: prosthetic memory

Other sinking such as the *Luisitana* or the *Andrea Doria* also resulted in the death of passengers in similar circumstances but their stories have not been so well known (Howard, 2003). The reason is that although there are no witnesses to the sinking (as they are all dead), the *Titanic* has still had a power of attraction to those who have lived the event through the media and the cinema. The traumatic event of the *Titanic* has been lived by society through various films and especially Cameron's film in 1997¹⁹. In fact, in October 2014 the jacket that Di Caprio was wearing in this film in the scene of the bow of the ship with the actress was auctioned by \$70,000 (Scarpellini, 2014). This suggests that contemporary society identifies with the tragedy, even through the media. It is what has been referred to as prosthetic memory which Robert Burgoyne defines as "the way mass

¹⁹*Titanic*, 1997. [Film]. Directed by James Cameron. USA: Paramount Pictures.

cultural technologies of memory enable individuals to experience, as if they were memories, even through which they themselves did not live” (Burgoyne, 1997). Landsberg (1995) has largely studied the term “prosthetic memory” applied to the media and adds that prosthetic memory “derives from a person’s mass-mediated experience of a traumatic event of the past”. And, although “prosthetic” memories complicate the distinction between memory and history, it is also, in the opinion of the authors, an emotional link to the past, a form of identification, a way to embrace the past as yours, which is what cultural heritage is about. Landsberg (1995: 175) explains that prosthetic memories are those that do not come from a “lived experience” in a strict sense: they are implanted. As Bedir (unknown) remarks in his analysis of Landsberg’s article, “the present is influenced by the experiences of the past and consequently shapes the outcomes of the future”. The mass media is a privileged arena for the creation of prosthetic memories. The film *Titanic* has been able to create prosthetic memories of the event for perhaps three main reasons: (1) the appealing (and virtually unknown) world of shipwrecks and sunken treasures (2) it is one of the highest-grossing films of all time and (3) is part of the history that shocked the world.

The sound and music people have heard and know from the various *Titanic* films, especially the music during the scene of the sinking of the ship, generate emotions (Stachel, 2006) as a symbol of not only the sinking but also of the generosity of the human spirit in moments of crisis, as the violinist, knowing he was going to die, kept playing to calm the rest of the passengers. It is therefore both a symbol of faith and also a symbol of helplessness (almost Kafkaesque). It represents that there was nothing else that can be done but wait to die. Obviously this experience is different from that of the survivors of the *Titanic* disaster but just as genuine. The viewer of the violin would again identify himself

with the tragedy through the media and remember the event as one actually lived through (Landsberg, 1995: 175).

1.5.3. Auction market: values by and for private property

The consequences of contemporary classical collecting have been largely discussed e.g. Chippindale and Gill, 2000 or Gill and Chippindale (2007) or Kaiser (1993). Auction houses also play a crucial role in world art. They are the driving force of a market which daily moves millions of pounds (Watson, 1997).

The history of the art market spans two thousand years. Auctions were held in ancient Babylon before the birth of Christ and house contents sales were popular in ancient Rome, where speculation became an important phenomenon between collectors (Learmount, 1985). It is possible too to find in the Middle Ages an art trade, especially in religious objects. In the 12th century, art fairs became popular, for instance the ones in Notre Dame Cathedral, Paris. After d in the 14th century we find how signatures appeared for the first time in paintings. This reflected the artist becoming more important. As a consequence, the first forgeries appeared, dating from the 17th century. During the end of the 18th century, soon after the French Revolution, art auctions came to be held in taverns and coffee houses. Such auctions were held daily and catalogues started to be printed to advertise the items available. In some cases these catalogues were as elaborate as the works of art themselves, containing considerable detail about the items auctioned (Learmount, 1985: 24).

Nowadays, auction is a sales technique which has a special magnetism. As Learmount (1985: 18), stated, this is because no fixed price structure exists and the seller can think he can obtain a high price and the buyer thinks he is going to acquire a bargain. As a result of this, Kaiser (1993: 347) identified the species of “loot-consumer”, the

acquisitor, whose interest in antiquities is not in the object itself but rather in the profits of speculating in the market, this is the economic value of the object. Hence auction houses are a way to collect objects. For this reason, they are not (or they should not be) in charge of awarding values to heritage objects because they are motivated only by economic gain. In fact, they only sell objects that already have a value.

The violin was found strapped to the back of Wallace Hartley. The reasons why he had done so may be many: he wanted to die with it since it was a gift from his fiancée, he hoped to be rescued with it so both his body and the violin could be returned to his fiancée, he did not want the violin to be lost in the depths of the ocean (there is an emotional link of a violinist to his instrument), it was his most precious and valuable possession (Yllana, 2013), he could trust on being better seen for rescue or he thought about using it to float on since the wooden item and the case would help his buoyancy in the water (Telegraph Reporters, 2013). These are all possibilities but we will never know the real reason: the possibility that prevails in our minds depends on the degree of emotion and drama we want to place on the object and its story. But this would have an effect on how we treat the object in the present. If Wallace Hartley thought of the ocean as his grave, he may have wanted the object to remain with him. If the body were rescued and reburied, the violin could have been reburied with him. Similarities can be drawn with Egyptian burials (where the deceased would be buried with their most precious belongings) or the flutes in the graves at Jiahu (the oldest playable instruments found) (Zhang *et al.* 1999).

For this reason, as a private object that has always been transferred through private hands and sold by private owner to private owner, the violin stands between the idea of public property and private ownership. It also challenges the concept of *property* as appropriate for the heritage.

Property of heritage according to law has been largely discussed (for instance, see Carman 2005). According to the *Hague Convention on the Protection of Cultural Heritage in the Event of Armed Conflict* (1954), cultural property is “movable or immovable property of great importance to the cultural heritage of every people”. As Forrest (2002) observes, it has to be important to all humankind, rather than be of value. However, the term “property” has been criticized since in the common law system it has a politico-philosophical weight and it is fundamental to protect the rights of the owner such as to have exclusive rights to alienate, to exploit, to exclude others and even to destroy it (Forrest, 2002). The violin, originally in private ownership (the fiancée) has finally been sold to another private owner. As such, he has the right to exploit and even destroy the violin. But if the violin is of “public interest” it should be visible and enjoyable by all.

Robert Ballard, the discoverer of the *Titanic*, stated that he wished he had claimed the site (Gosk, 2010 [online]) so nobody could own it:

When I found the *Titanic*, I went to the courts, and I said, “Well, can I own the *Titanic*?” And they said, yes. It's an abandoned shipwreck. All you have to do is go down and retrieve one object such as a saucer or plate or something, come into the courts, and we'll make you the owner. But we'll make you the owner under one condition, that you remove it from the bottom of the ocean. ... I was opposed to that.

1.6. Conclusions

For Smith (2006) the real sense of heritage is in the act of passing on and receiving memories, emotions and knowledge. Talking about emotions in tourism, Robinson (2012: 21) claims that any engagement with the world and its peoples is an emotional engagement, including tourism. The tourist wants to experience sensations, feelings and emotions. The emotions of the tourist need to be challenged: moments of joy, sadness, anger or fear are necessary for a closer experience with the heritage (Robinson, 2012: 22).

These emotions, memories and knowledge are engaged when the various stakeholders change, influence and manipulate the applicable values

Figure 4.I.6. illustrates the process that has been explained in this chapter: from an inexpensive violin to an expensive piece of heritage by bestowing a series of values as a consequence of its specific circumstances; from the tragedy, to the discovery of the shipwreck and through the media and the auction market.

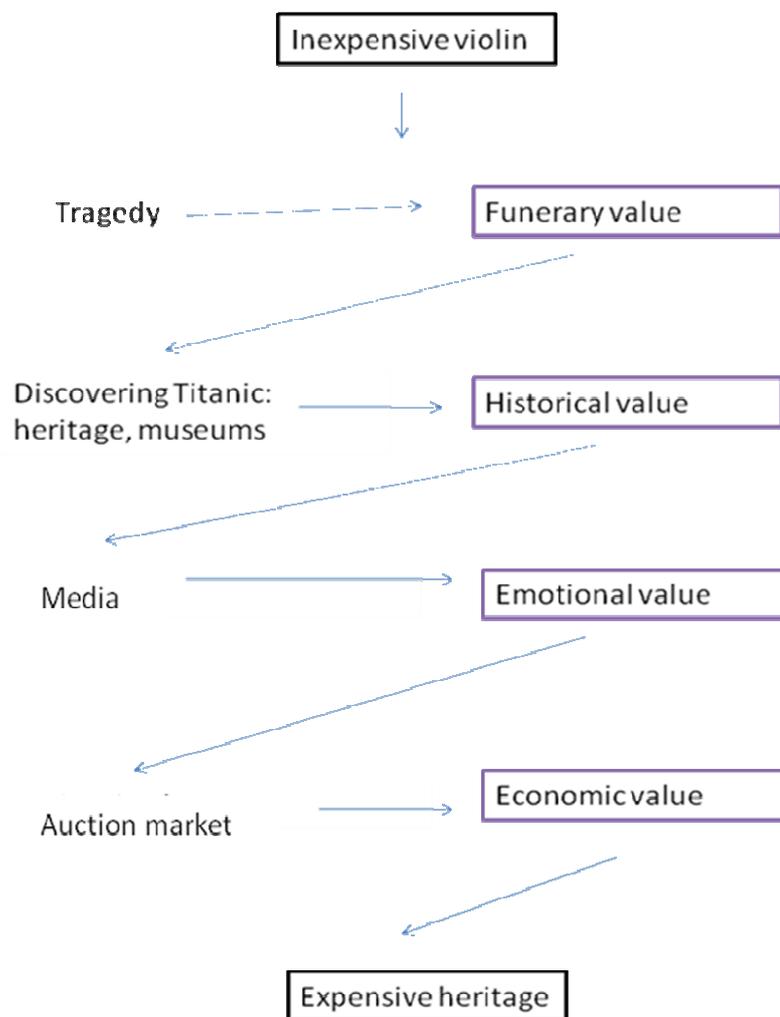


Fig 4.I.6. Process of moving from an inexpensive violin to expensive heritage

Depending on who takes the decision on the various values, the violin will be considered differently. It will also influence whether it is considered as cultural or private property. The interpretation of these values will change the way the audience will see the violin and how they will feel around the violin (Hooper-Greenhill, 2000). In this regard, we have seen that the violin has moved from an inexpensive violin to a violin with high economic values. This economic value has been reached because of the other values that were awarded by the museums and the media and cinema. The violin can be considered a personal object (a funerary item taken by Wallace Hartley into his grave, the ocean) or as an object with a value of a much larger story, a symbol and a historical document of the tragedy of the *Titanic*. However, it is necessary considering whether these values are real or have been manufactured by the cinema through a prosthetic memory: if the audience feels an emotional and historical connection with the story that the cinema has told, not with the real one.

The violin is in private hands and as a consequence is private property. That should not be a problem if the violin were not now be considered heritage. What this chapter has tried to prove is that an item with no importance is now considered an object “with universal value” by a process that has finally considered it heritage. If this is the case, acknowledgement of this power by legislation is what will make the violin protected and available to all. However, the legal gap that this chapter tried to close is the fact that an item that was part of a collection in an underwater cultural heritage site but that has not been under water for more than 100 years is not protected by the 2001 UNESCO Convention. And the ambiguity on the Article 18 on collections does not specify what to do with those items, which belong to a site, but are not considered part of the site. As a consequence, this legal vacuum has to be covered by with other agreements that consider the violin cultural heritage and that protect it. Maybe the interested states could recover the

violin and make it available for all. It could also remain in private hands but be available for visits. However, these options would only be useful if the violin were worth protecting.

I.7. Proposal

The dilemma of awarding values to the violin by the various stakeholders has resulted in the violin changing from an inexpensive violin to a really expensive piece of heritage. What seems clear in this chapter is that due to its uniqueness the violin should be enjoyed by all. However, it is unclear if the violin has to be returned to the public domain or remain private owned (Figure 4.I.7).

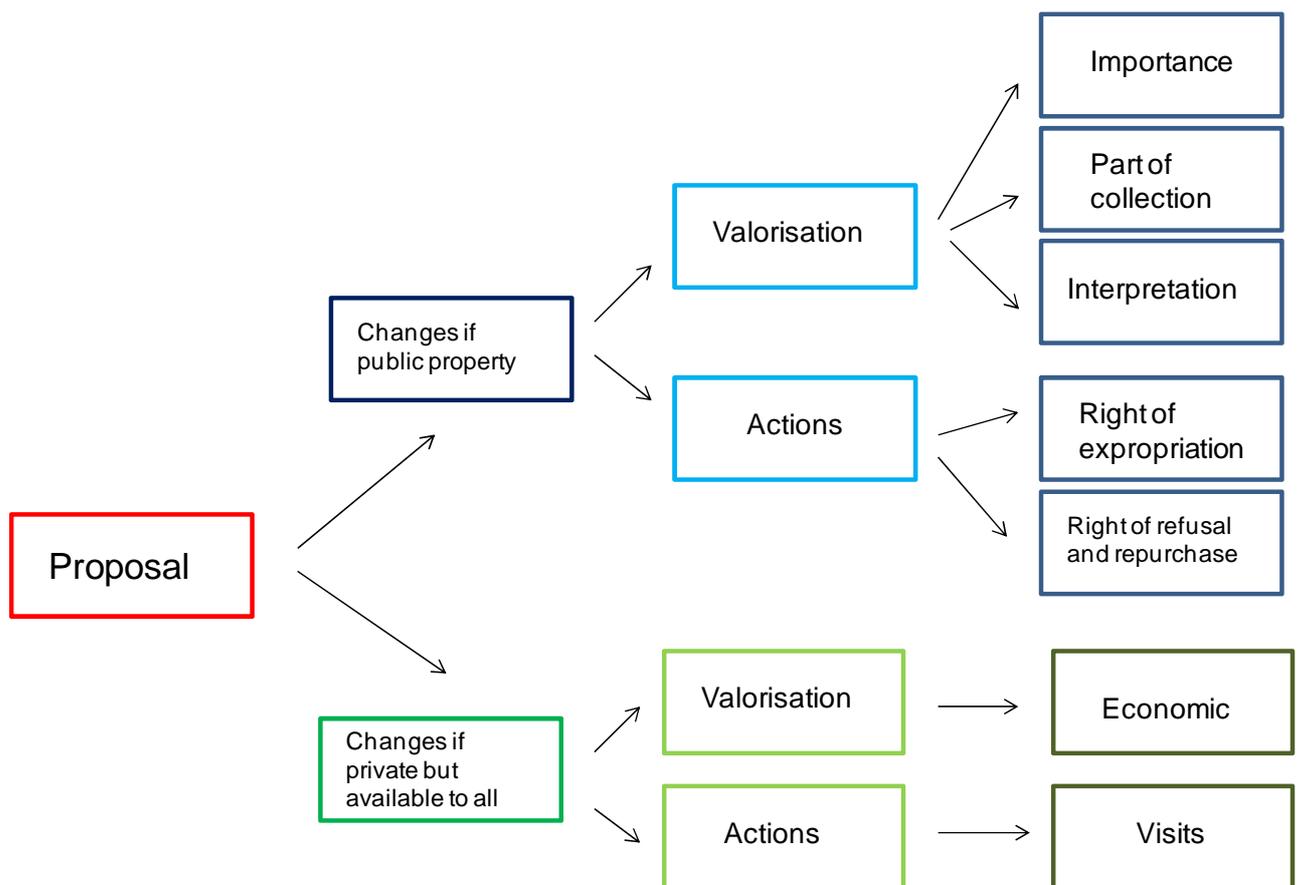


Fig 4.I.7. Proposal on the violin of the *Titanic*

1.7.1. Necessary changes if the violin is considered to be public property:

1.7.1.1. Valorisation

- *Claiming the violin for its importance, not for the time it was under water*

The violin belongs to the ship *RMS Titanic*, which is underwater cultural heritage according to the *UNESCO Convention for the protection of the Underwater Cultural Heritage* (2001). However, the violin was taken out of the water only 10 days after the sinking of the ship and is not. It is also excluded from the Agreement between the four countries with a verifiable link to the ship for not being part of the archaeological site. However, the violin of the *Titanic* may not be considered underwater cultural heritage under the scope of the 2001 UNESCO Convention but it is clearly cultural heritage of considerable importance, representativeness and uniqueness (Aplin, 2002).

Following the already mentioned idea by Carman (1996) of the law as “gatekeeper”, the violin, for not being “marked” worthy of legal coverage, has been recategorized and revalued as an “economic piece of heritage” since it has been sold in an auction house. The law has changed the moral status of the violin (symbolic, historical) and it has changed how it is understood. The personal gain of a collector has overshadowed the universal value of the violin because the law established an arbitrary number of “100 years under water” that decided that the violin was not underwater cultural heritage and as a consequence would not be protected. The combination of other laws can fill that legal vacuum (Aznar-Gómez, 2004), revaluing the violin again as cultural heritage under its already established importance.

- *Claiming the violin as part of the collection and establishing its protection due to the reassembly of the collection*

Since it is not included within the scope of the 2001 UNESCO Convention, it can be separated (depending on the interpretation of “collection”) from the main collection. It was even sold to a private buyer although it was possibly the most iconic item of memorabilia within the sunken vessel (Kennedy, 2013).

- *Claiming the violin for its different interpretation of values, choosing that most applicable*

The violin can be interpreted, transformed or manipulated to reach the audience by (1) leaving the violin as much as possible in an untouched state complying with the conservation and preservation rules, defunctionalizing the object and granting the violin with an *aesthetic value* (2) awarding the violin with a memorial (and *funerary*) *value* even it has been decontextualized or (3) transforming the object to enable it to be played, stressing it as a symbolic object and underlining the *emotional value* of sound and the power of prosthetic memory, even if it means transforming the object. The question is what value should be pre-dominant for the violin for the most accurate interpretation.

1.7.1.2. Actions to take

- *If it is finally decided that the violin should be public property, the states could obtain ownership exercising the right of expropriation*

In all legal systems, the rights of the individual have been limited in favour of the public interest if the property is of great importance (Forrest, 2002). According to Osborn’s Concise Law Dictionary (Woodley, 2009) *expropriation* is defined as “compulsorily

depriving a person of his property by the state (perhaps without compensation)” for a purpose deemed to be in the public interest. If the four countries with an interest in the *Titanic* decide that the violin has a high importance as a collection and as such, it should be of public benefit they could expropriate it from private property and make it available to all. In fact, some countries have the right to acquire property (“nationalization” of the cultural heritage), that according to Carman (2013) has advantages like the full control over the fate of the property, but it “rides roughshod” over private rights.

- *If the right of expropriation seems excessive, “the right of first refusal” and “the right of repurchase” could be applied*

By “the right of first refusal”, if a property of national interest is on the market, the authorities have the right to be notified of the sale and its terms, and to acquire that property before any other interested party. This could be applied to the next sale of the violin. However, if there is no notification of the sale, or if the terms are different to the market sale, the authorities have “the right of repurchase”. It means that authorities can buy the property on the original terms even if it has already been sold, which would be the current case of the violin if the states interested in the *Titanic* would sign an agreement of protection of the objects with retrospective scope. Applying these two rights, the violin could be for the benefit of all. Thanks to “the right of first refusal” and “the right of repurchase” the State could have priority in acquiring the object if it so wanted.

1.7.2. Necessary changes if the violin is to be considered to be private property, but it is acknowledged it has to be seen for all:

1.7.2.1. Valorisation: economic value

The violin became (common) cultural heritage from the moment the *Titanic* was

discovered, researched and consequently gained an interest in society (Carman, 2013). And it has been this recognition of the object as cultural heritage what has awarded it with an economic value. This economic value has to be respected because it means that the other values are acknowledged.

1.7.2.2. Actions to take: conditions for visits

Prott and O’Keefe (1984: 190) specify that to regulate the protection of an object it is not necessary to own it. On this basis, an alternative to expropriation of the object could be to keep the right to own private property but with some obligations by the owner, for instance allowing the study by researchers or allowing visits by the general public. In this regard, this study has found an example of local legislation that could be applied to international regulations. The *Ley 9/1993 del Patrimonio Cultural Catalán* (Law of Heritage of Catalonia, 1993), expressly states that if an object is of “national interest” the owner is obliged to show it to the public and allow researchers to examine it:

SECCION TERCERA. REGIMEN APLICABLE A LOS BIENES CULTURALES DE INTERES NACIONAL

Artículo 30. Acceso a los bienes culturales de interés nacional

1. Los propietarios, poseedores y titulares de derechos reales sobre bienes culturales de interés nacional están obligados a permitir:

- *a) El examen y estudio de los bienes por los investigadores reconocidos por alguna Institución académica, con la presentación previa de una solicitud razonada, avalada por el Departamento de Cultura.*

[...]

- *c) La visita pública de los bienes, en las condiciones que se establezcan por Reglamento, al menos cuatro días al mes y en días y horas previamente señalados.*

THIRD SECTION. REGIME FOR CULTURAL PROPERTY OF NATIONAL INTEREST

Article 30. Access to cultural property of national interest

1. Owners and holders of real rights over cultural property of national interest are obliged to allow:

- a) The examination and study of property by recognized researchers of any academic institution with the prior presentation of a reasoned application, supported by the Department of Culture.

[...]

- c) The public visits of the property, under the conditions established by regulation, at least four days per month and on days and hours previously reported.

The option of categorizing the violin as “of interest” would benefit the owner, in the sense that the violin could be included in national or world heritage lists. This prestige would reevaluate the violin and its economic value would increase in a future sale. This would be in benefit of the owner, which could be more open to a condition of visits under this premise.

The violin of the *Titanic* is now in the hands of an anonymous collector (who may or may not be a private individual or a museum) who must decide whether to exhibit it, not exhibit it or maybe even restore it to functional order. However, the violin being in private ownership poses the issue of public property because of its importance (Ashworth, 2007.) Given its importance this valuable object should not be excluded from the public domain by a private owner. The violin of the *Titanic*, if adjudged to be of “international interest” or “historical interest” could be subjected to a similar article in the agreement, making it available to all.

II. Use:

ancient lead

II. Use: ancient lead for dark matter experiments

Legal uses of underwater cultural heritage: ancient lead (from shipwrecks that are more than 100 years old) is being used for experiments in dark matter detection. However, this creates a controversy for two main reasons: the uses that would have justified the destruction of this part of the heritage and the amount of information loss, depending on how it is recovered.

II.1. Introduction

There are two major directions in underwater cultural heritage management: preservation for knowledge and market place for profit. However, there is a dilemma when something falls in the middle.

Underwater cultural heritage management is mainly concerned with preserving the historical and archaeological values of sites and artefacts against the forces of development and the commercial market. However the use of underwater cultural heritage artefacts for purposes other than historical research raise questions about the ethical management of these heritage sites and artefacts.

The controversial question has been recently raised considering that underwater cultural heritage could present a double value: the inherent historical value of the objects and the unique chemical and physical properties of the materials that constitute the object (Perez-Alvaro and Gonzalez-Zalba, 2013). A prime example of this duality is ancient lead. Lead from the Greek and Roman eras that has been under water may provide information on early metallurgical processes as well as commercial routes and ancient manufacturing

companies. However, ancient lead also retains extremely high levels of purity which is difficult to achieve by modern materials or commercial means.

In 2011, 120 archaeological lead ingots from a Roman shipwreck over 2000 years old (Nosengo, 2010) were transferred to a laboratory for experiments in particle physics by a museum in exchange for funding for excavations. The ancient lead, having been underwater for 2000 years, presented levels of radioactivity 100,000 times lower than modern lead (Perez-Alvaro, 2013). The Laboratory of Gran Sasso signed an agreement with the Museum of Cagliari to have access to the lead. Figure 4.II.1. presents one of the ancient lead ingots that the laboratory acquired from the museum and it is currently stored in one of the laboratories warehouse.



**Fig 4.II.1. Ancient lead ingot on the warehouse of the Laboratory of Gran Sasso
Source: authors' photo.**

There are at least seven other laboratories around the world using ancient lead obtained from underwater cultural heritage sites for their experiments. However, not all

laboratories have signed an agreement with a museum and some have bought the lead from private companies (Ananthaswamy, 2010).

The fact that underwater cultural heritage recovered for experiments that will benefit mankind (although it will be modified or even destroyed by those experiments) introduces a new ethical dilemma for the management and the protection of underwater cultural heritage (Perez-Alvaro, 2013). However, as Figure 4.II.2. illustrates, the issue is not only its uses but also the way the heritage is recovered (private companies or archaeologists) and which of the uses should be allowed.

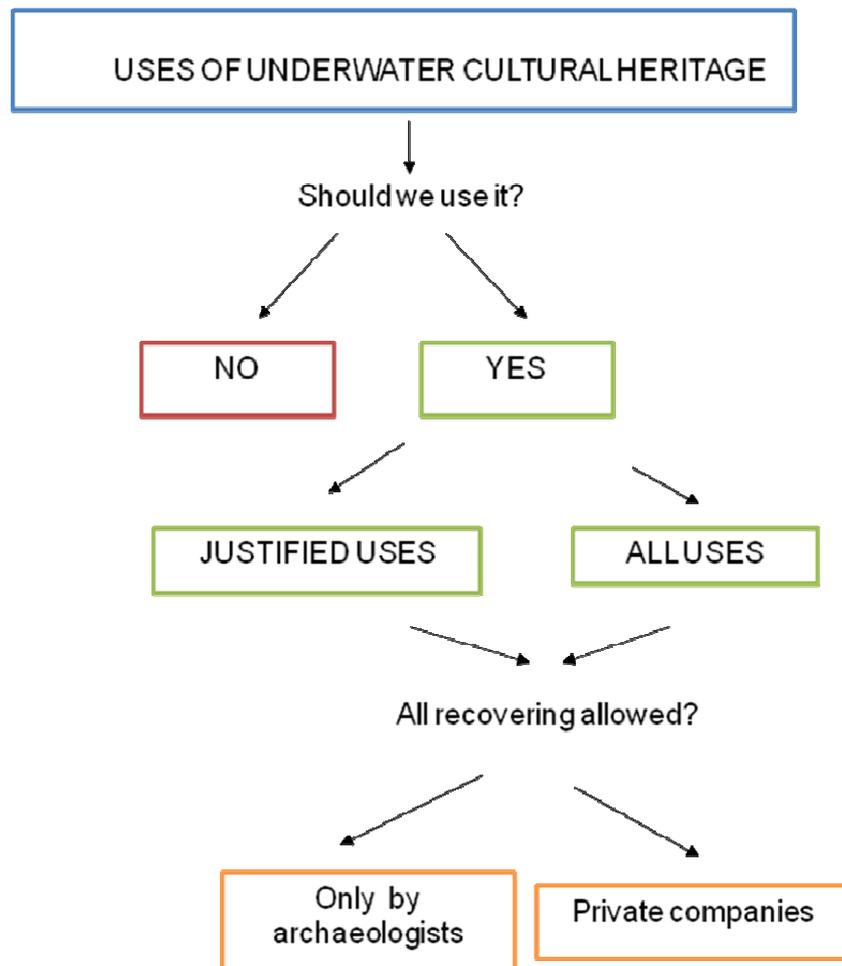


Fig 4.II.2. Structure of the ethical concerns of this chapter

This chapter aims to state the cases from both sciences (particle physics and cultural heritage management) in order to create a debate based on facts. The first part will set out why irrevocably altering or damaging that part of heritage *does* matter. The second part will explain why the use of ancient lead is necessary and the significance of particle physics. The third part will be devoted to analyzing the legal framework to explore which uses are allowed by law. Then, a brief review of the duality of the ethics around the debate will be evaluated. Finally, the chapter will suggest a solution which is a common ground where both preservation and use of the underwater cultural heritage fit.

The debate has created curiosity in the press (Pringle, 2013; Moskowitz, 2013; Gwynne, 2013), and it has become a topic for opinion. However, the debate is complex and requires a sound understanding of all the issues before reaching any conclusions.

II.2. Issue

Underwater cultural heritage is under threat from various menaces such as natural deterioration or illegal salvage (Manders, 2004; Aznar-Gómez, 2010). However, it also faces what we call “legal threats”, such as:

1. “Clean” energy provided by wind, wave solar and other “renewable” energy facilities and their construction (Flatman, 2007: 86). The construction of new platforms and facilities is an increasing concern regarding underwater cultural heritage since climate change is a menace to the environment and clean energies are developing for this reason.
2. The laying of submarine cables and pipelines (Perez-Alvaro, 2013b), that has been largely forgotten by literature and legislation. However:

Thousands of kilometres of submarine cables lie on or under the seabed carrying telephone calls and internet data (only 1% of telecommunications are established via satellite). In 2013, 283 cables are active with 29 new routes planned (Perez-Alvaro, 2013b: 56).

The dilemma is what would happen if one of the routes for laying cables were planned to go through an underwater cultural heritage site. There is a no legal regulation for protecting those submerged places. The quandary is if the protection of these sites should require diverting these routes with resulting in a longer and more expensive route. Some underwater cultural heritage sites can have large areas, for instance, the submerged part of the village of Port Royal, in Jamaica with an area of 13 hectares (28.6 acres) (Hamilton, 2006).

3. Construction of ports and developments in harbours.

4. Fishing. As Dromgoole (2013) mentions, some types of fishing (especially bottom trawling: Figure 4.II.3. illustrates how the net is dragged), could cause damages to possible underwater cultural heritage lying at the bottom of the ocean.

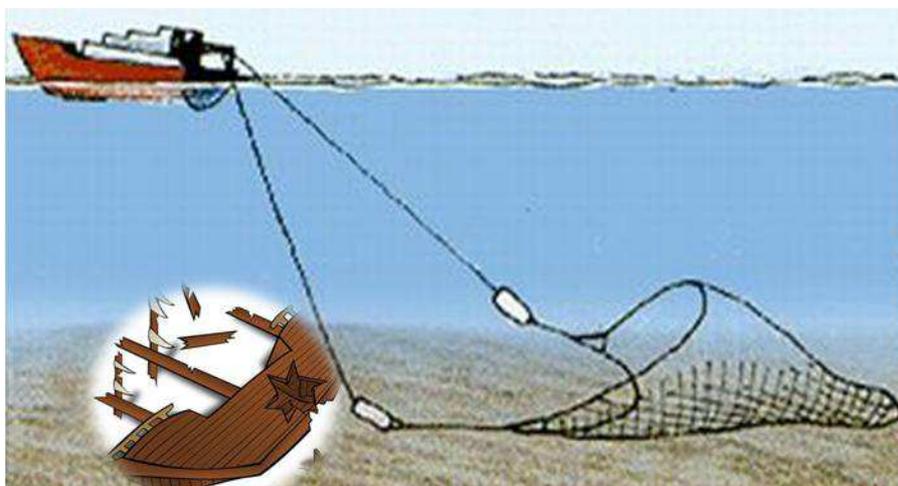


Fig 4.II.3. Bottom trawling.

Figure adapted by the author from the one available at: <http://www.greendiary.com/ecology-devastating-bottom-trawling-demands-ban.html>

5. Legal uses of underwater cultural heritage, such as the one that concerns us in this chapter: recovery and use of ancient lead for particle physics experiments.

This chapter proposes what we have already mentioned in the Literature Review (Chapter 2), that Flatman (2007: 86) has defined as “offset” heritage i.e. acceptable levels of damage to the underwater cultural heritage if it provides a broader social benefit such as the destruction of the ancient lead for physics experiments that will benefit mankind.

However, it is not only the use that will be challenged in this chapter but also how it is recovered. Some laboratories have been known to get the ancient lead not through agreements with a museum but from private companies. Ananthswamy (2010: 36) commented on a particular case:

The CDMS (Cryogenic Dark Matter Search) team had to find old lead [...]. An Italian colleague mentioned that he had been using lead taken from two-thousand-year-old Roman ships that had sunk off the Italian coast. The CDMS team located a company that was selling lead salvaged from a ship that had sunk off the coast of France in the eighteenth century. Unaware that they were doing anything illegal, the researchers bought the lead. The company, however, got into trouble with French customs for selling archaeological material. Illegal or not, the lead worked.

An archaeological site preserves traces of history that allow interpreting the role a material played for hundreds, even thousands of years. Therefore, methods and techniques used in every excavation must be as non-destructive as possible. They require a project design which includes an evaluation of previous or preliminary studies, a project statement and objectives, a method statement, anticipated funding, an expected timetable, a safety policy and a programme for publication (UNESCO, 2006). And what it is more important it results in a record of the material. Excavating archaeological sites without following these steps may cause irreparable damages or loss of information to the archaeological record (Dowman, 1970: 28).

Every item in an archaeological context can provide unique information. However this contextualised information is not renewable and if not recovered during the archaeological process may be lost for good. An artefact recovered during a recorded archaeological excavation is important for two main reasons:

a) we know where it was found: it has a *provenance*

b) we know what it was found with: it has a *context*.

For Bator (1981: 25) a piece of archaeology without a provenance “is of limited historical significance”. For this reason, the main difference between recovering the objects by private companies and archaeologists is the documentation and interpretation of those objects. However, archaeology is more than what is immediately evident under the excavator’s spade (Ceram, 1966: 24). It has come to mean the study of past human societies and their environments through the systematic analysis of material culture or physical remains. Archaeology is not which objects we obtain but how we interpret them according to their archaeological context, where they have been found and according to the material and data that we already have. As a consequence, every find in archaeology is followed by interpretation. Renfrew and Bahn (2008: 17) state that archaeology is partly the discovery of the items of our past, partly analysis and partly the exercise of the imagination and interpretation by experts in the topic. Archaeology is the sum of discoveries in the field, research methods and especially questions, ideas and theories.

However, according to Dowman (1970: 28), even official archaeological excavations are often as harmful as illegal excavations. In countries with a vast archaeological wealth such as Greece, Italy or Spain, a new form of archaeological excavation has emerged: salvage archaeology. Renfrew and Bahn (2008: 561) remind us that this kind of archaeology is due to the growth of the building market. These countries

are constructed on archaeological remains, so when a development company tries to build on virgin ground, they usually find archaeological fragments. Typically the government is informed, the works are stopped and the company has to pay for archaeological excavations in order to determine whether these remains should be conserved. However, Neumann *et al.* (2010: 31) warned that these works are often executed as fast as possible leading to a lot of mistakes. Archaeologists have damaged thousands of pieces. The only important issue is to finish the work because the development company does not want to lose money. For this reason, some authors argue (see for instance Carman (2013)) that archaeology creates destruction. However, for the author, when we destroy, we also create. As a consequence, for the author, the question is not how to prevent destruction but what is created by destruction.

According to Muckelroy (1980) there are 538 known wrecks on the Mediterranean Sea and of these 407 dated from the Roman Empire. He maintains that only Roman items can be found underwater (e.g. ingots) since on land they would already be melted down (the lead is transformed into ingots only for transportation). In this regard, underwater archaeology makes a contribution that land archaeology cannot. However, for Stemm (2000) there is a difference between the objects of life aboard the ship such as for defence and navigation (cultural artifacts) and the ones that were transported on the ships as cargo or freight (trade goods). Ingots would fall into the last category.

In fact, for the heritage agency in the UK (English Heritage, 2006) one of the primary philosophies is to conserve a representative sample for future generations. In 261 BC, the Romans produced 100 *quinqueremes* and 20 lighter *triremes* in 60 days “from the tree” (Baker, 1998: 19). For instance the shipwreck from the experiment agreed with the Museum of Cagliari carried more than 1000 ingots (33 tonnes of lead). Of those, the

experiment uses 120 lead ingots, each weighing about 33 kilograms (Nosengo, 2010). Only 20% of the whole amount would be used. There are around 9 laboratories around the world needing ancient lead for their experiments. Each experiment uses approximately 8 tonnes of this lead. This makes 72 tonnes of ancient lead used at least every 5 to 10 years. Figure 4.II.4. illustrates how the ancient lead ingots are accumulated in the Laboratory of Gran Sasso.



**Fig 4.II.4. Ancient lead ingot on the warehouse of the Laboratory of Gran Sasso
Source: authors' photo.**

The main problem for heritage managers is that although the recovery of the ingots is carried out by archaeologists, in some cases laboratories have paid for the archaeological excavations in exchange for the ingots (Nosengo, 2010). For these laboratories, the use of underwater cultural heritage by the physicists should not be viewed as a commercial transaction, since heritage also belongs to them, so it should not give anything in exchange.

This exchange is what gives the heritage an economic value. For instance Principle No. 3 of the *Ethics Protocol of the Society for American Archaeology* (SAA, 1990) shows the main justifications of archaeologists against the commercialization of objects belonging to an archaeological context:

Principle No. 3: Commercialization. The Society for American Archaeology has long recognized that the buying and selling of objects out of archaeological context is contributing to the destruction of the archaeological record on the American continents and around the world. The commercialization of archaeological objects - their use as commodities to be exploited for personal enjoyment or profit - results in the destruction of archaeological sites and of contextual information that is essential to understanding the archaeological record. Archaeologists should therefore carefully weigh the benefits to scholarship of a project against the costs of potentially enhancing the commercial value of archaeological objects. Whenever possible they should discourage, and should themselves avoid, activities that enhance the commercial value of archaeological objects, especially objects that are not curated in public institutions, or readily available for scientific study, public interpretation and display.

However, this final idea (the use of ancient lead can be justified for the purpose of scientific study) generates controversy and will be discussed below. According to Carman (2002) underwater cultural heritage has to benefit archaeology and science more generally. However, physicists must prove that the experiments are worthwhile and there are not commercial aims involved.

Both archaeologists and physicists justify their research priorities and these research priorities depend on different points of views. However, establishing an ethical case for the use of ancient lead shows that both areas of research may be justified under Western philosophical ideas (applicable also to archaeology). Two main theories applied to this case are worth mentioning. On the one hand, the consequentialist/utilitarian theory defends that what makes an action right or wrong is the effect it has in the world (which means the loss of the underwater cultural heritage because of the experiments) is what makes it

questionable. On the other hand, the deontological theory defends that it is the intrinsic quality of an action that makes it right or wrong, (Wylie, 2003). The use of underwater cultural heritage for research experiments does not make the action wrong, since its use is by and for the acquisition of knowledge, no matter the consequences (which is the loss of underwater cultural heritage).

In any case, there is a fine line between those who defend that destroying the past is “wrong” and those who claim that knowing more about the future is “right”. The moral imperative linked to significant decisions is the conservation of archaeological resources (Dunnell, 1984). In each instance of significance, the archaeologist is caught in a moral dilemma and as a consequence it is necessary to explore the consequences of the dilemma. Principles taken for granted in cultural heritage management are being challenged (Wylie, 2003).

II.3. State of knowledge

The research on dark matter detection aims to underpin some of the most fundamental properties of the universe. It has been demonstrated experimentally that ordinary matter, i.e. elements of the periodic table, constitute only 17% of the total matter of the universe whilst the remainder is attributed to dark matter (Komatsu *et al.*, 2011). The understanding of the origin of the remaining 83% of the matter present in the universe remains one of the most fundamental open questions to human kind (Perez-Alvaro and Gonzalez-Zalba, 2014: 56).

The research on dark matter aims to shed light on one of the most fundamental questions that modern astronomy, in particular, and humanity, in general, can ask: what is our universe made of? A deeper understanding of the properties of dark matter could clarify the origin of the universe and the impact these new particles will have on its evolution. However, direct observation of its existence has remained elusive so far due to

its particular properties, as it does not emit radiation and only interacts weakly with ordinary matter.

Therefore dark matter detection experiments require extremely sensitive equipment to distinguish a dark matter event from other particles such as cosmic rays (fast-moving particles that continuously shower the Earth from deep space) or even the intrinsic radioactivity of environmental materials (Perez-Alvaro and Gonzalez-Zalba, 2014). Particle physicists have to shield dark matter detectors from unwanted sources of spurious signals. First of all, as Figure 4.II.5. illustrates, experiments are conducted a few kilometres deep underground to reduce cosmic ray flux.

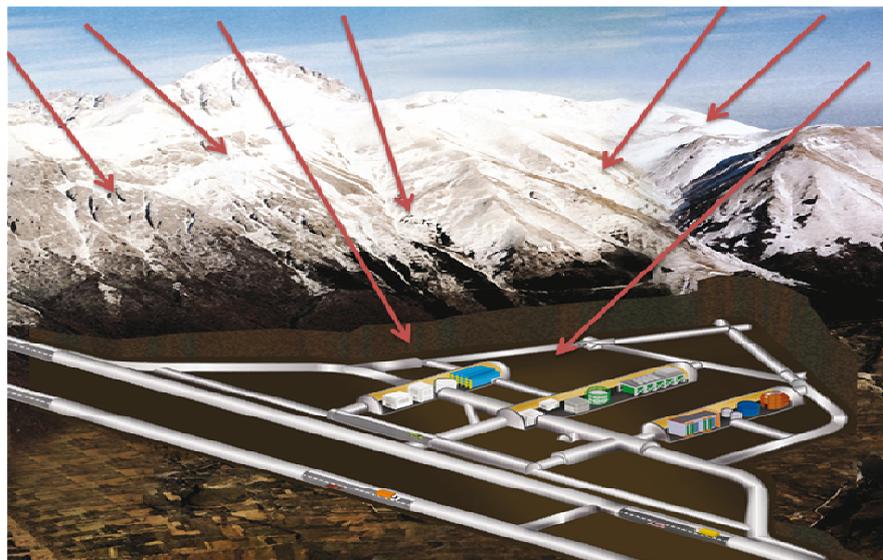


Fig 4.II.5. Configuration of underground laboratories. Source: LNGS.
Available at: <https://www.mpp.mpg.de/english/research/experimental/gerda/>

Next, a layer of polyethylene is used to reduce cosmic ray neutron radiation. Then a commercially available low-radiation lead aims to reduce gamma radiation. Ancient lead comes next to reduce the radiation from commercial lead and finally a radiopure inner layer of copper that shields the dark matter detector from the residual ancient lead radiation (Lang and Seidel, 2009).

In modern experiments, normally a 10 cm thick layer of ancient lead surrounding the detector is required for adequate shielding, as Figure 4.II.6. tries to illustrate. This protection layer is engineered by melting ancient lead ingots to the required shape. In the particular case of Gran Sasso's CUORE experiment this will mean a total amount of four tonnes of ancient lead bricks (Perez-Alvaro and Gonzalez-Zalba, 2014).



**Fig 4.II.6. Image at the Laboratory of Gran Sasso showing the shielding
Source: authors' photo.**

Lead is the material par excellence in radiation rich environments as a shielding for damaging radiation. It can be found in nuclear power plants but also in more common environments such as hospital X-ray chambers (Smith *et al.*, 2008). Lead's properties, independently of its origin, of its large atomic number, low intrinsic radioactivity, good mechanical properties and reasonable cost make it an excellent shielding material. In short, it efficiently absorbs unwanted background radiation that could generate spurious signals in the detector.

However, freshly mined and processed lead has a finite level of intrinsic radioactivity. This level of radioactivity is unsuitable for state-of-the-art dark matter searches and therefore methods to reduce it are necessary. The most problematic radioactive impurity present in lead is one of its unstable isotopes, lead-210 (^{210}Pb), which decays into the stable isotope lead-206 (^{206}Pb) through a series of radioactive transitions. The presence of ^{210}Pb can severely affect the sensitivity of experiments searching for dark matter candidates (Lang and Seidel, 2009).

The reason for ancient lead preserved under water to present lower levels of intrinsic radioactivity is for two main reasons:

- (1) Due to the natural decay of ^{210}Pb into ^{206}Pb . Half of the ^{210}Pb content decays into ^{206}Pb in 22.3 years and so on after it has been processed and purified (for example as by the Greeks or Romans 2000 years ago) (Lee, 2000). As a rule of thumb, the longer since it was originally processed the lower its intrinsic radioactivity.
- (2) Seawater does not purify lead but it helps in the decay process explained above. First of all, the overburden of water prevents the chemical contamination of lead by for example radioactive elements present in the atmosphere such as radon. Moreover, the cosmic ray flux that showers the earth continuously is greatly reduced at these depths. Cosmic rays can activate stable lead into radioactive elements reducing the rate of decay. Although there are artificial techniques available to reduce the radiation content of modern lead to the same level as that has been in seawater for centuries, it cannot achieve the level of purity of ancient lead samples (Alessandrello *et al.*, 1993).

Alternatives to the use of ancient lead in particle physics experiments have been proposed such as lead from cold ores (Alessandrello *et al.*, 1993) or microelectronics grade lead (Lee, 2000). Moreover, there is an artificial technique available to reduce the radiation content of lead but it cannot achieve still the level of purity of ancient lead samples such those salvaged from Oristano (near Sardinia) and Silvia (salvaged near Biserta) with a quoted age of approximately 2000 years. This technique is known as laser isotope separation and can reduce the original content of ^{210}Pb between 10 and 100 times. However, the ultimate ^{210}Pb in this ultra-purified lead is still ten times greater than in ancient bricks (Danevich, 2009). Moreover, this process is expensive and currently limited in capacity. As a consequence, each sample of salvaged lead must be analysed and benchmarked against the commercial grade ultra-low-alpha lead. Only if it is demonstrated that the level of purity required by each individual experiment is lower than what commercial sources can provide, ancient lead should start to be considered for use.

II.4. Legal perspective

The law needs to catch up with new developments (Trubek, 1972). Underwater cultural heritage is a field which has evolved mainly in the last 20 years. The general “demand” for historic shipwrecks has grown, increasing their economic value (Kaoru and Hoagland, 1994) and the conflict between different users. However, two conventions to preserve the underwater cultural heritage were implemented more than 30 years ago (UNCLOS) and more than 10 years ago (UNESCO). The use of cultural heritage for purposes other than archaeological knowledge has not still being contemplated by legislation. The law needs to adapt to new changes, either by the implementation of new agreements or the creation of new annexes. We will examine these two main regulations that cover the protection of underwater cultural heritage which challenge the ethical concerns arising from this issue.

II.4.1. 2001 UNESCO Convention

Although experiments of particle physics or other kind of experiments are not expressly mentioned or regulated by the 2001 UNESCO Convention, some aspects mentioned in various articles can be interpreted on this direction:

II.4.1.1. Benefit of humanity

Article 2.3. States Parties shall preserve underwater cultural heritage for the benefit of humanity in conformity with the provisions of this Convention.

Since there is no definition of the term “benefit of humanity”, it is unclear what it means. On the one hand, the term “humanity is usually applied to making the territories of the Antarctic and the outer space (including the Moon) enjoyed for all and exploited by none. No countries can own the Antarctic or the Moon. In recent years, nevertheless, the United Nations has tended to apply the concept to environmentally vulnerable sites (Tenenbaum, 1990). For instance, the management of the Antarctic under this common heritage principle establishes parks dedicated to environmental protection and ecosystem preservation where no exploitation is permitted (Tenenbaum, 1990).

On the other hand, the term “benefit” can have different meanings: economic, educational, emotional or cultural. If dark matter searches are defined by Revol (2007) as “the expression of human curiosity: of the need to understand the structure of matter, life, the structure and evolution of the universe, which are the main subject of fundamental research, so that we can decode our past and predict our future”, dark matter searches seem to have a benefit for humanity. The experiments, as a consequence, would be allowed under this article.

II.4.1.2. Preservation in situ

Article 2.5. The preservation *in situ* of underwater cultural heritage shall be considered as the first option before allowing or engaging in any activities directed at this heritage.

Preservation *in situ*, as we will see in the climate change chapter (4.IV.) is the first option, but not the only option. This means that although underwater cultural heritage has been traditionally thought to be best preserved *in situ*, and it should be seen as the first option, its recovery would not be contravening this article of the Convention. As a consequence, the recovery of the ingots for the experiments is not forbidden.

II.4.1.3. Scientific interest

Rule 2. Annex. [...] (b) deposition of underwater cultural heritage should not prejudice the scientific or cultural interest or integrity of the recovered material [...]

For Maarleveld (2012) the “scientific value” is different from the “scientific interest”. The dilemma is that both, dark matter experiments and archaeological knowledge are of scientific interest. The difficulty is which scientific interest should prevail.

II.4.1.4. Trade of ingots in exchange for funding excavations

Rule 2. Annex. [...] Underwater cultural heritage shall not be traded, sold, bought or bartered as commercial goods. [...]

According to Dromgoole (2013), commercial exploitation of underwater cultural heritage using methods that do not involve the sale of underwater cultural heritage (or other exchange) are not an infringement, unless they result in the dispersal of the material (Dromgoole, 2013). However, it is the exchanging of ingots as a *quid pro quo* in the transaction what is not allowed under the 2001 UNESCO Convention (Maarleveld *et al.*, 2013):

All archaeological activity can be governed by commercial principles, as long as the activities are authorized in conformity with the Convention, and as long as the finds that belong to the site are not part of the commercial equation.

This is the main Article that the recovery of ingots would be contravening since the ingots are the objects that are of interest in the commercial equation.

II.4.1.5. Commercial exploitation

Article 7. Underwater cultural heritage shall not be commercially exploited.

The term “commercially” is here arguable. If the use of our experiments were to be executed by private companies to enrich themselves even if the publication of results and the share of knowledge would be for the benefit of the humankind, their final goal would be, at the end of the day, economic. However, if the experiments are carried out by national laboratories that aim to share their knowledge and make it available to all, the commercial exploitation connotation would not exist.

II.4.1.6. Integrity of the material

Rule 2. Annex. [...] (b) the deposition of underwater cultural heritage [...] provided such deposition does not prejudice the scientific or cultural interest or integrity of the recovered material [...]

The melting of ingots is an irreparable loss of underwater cultural heritage. Ingots are of great value for study to archaeologists as a manifestation of ancient Rome's manufacturing and trading powers. In the case of the agreement between the Museum of Cagliari and the laboratory, before melting the ingots, the inscriptions on each one of the ingots was removed and sent back to the museum for conservation and exhibition (the trademarks contain the names of various firms that extracted and traded lead). As a consequence,

although the object is destroyed, most of the information is preserved. A different situation would arise in the case of the recovery of ingots by private companies.

II.4.1.7. Archaeological recovery of the material

Article 18.1. Each State Party shall take measures providing for the seizure of underwater cultural heritage in its territory that has been recovered in a manner not in conformity with this Convention.

In the case of the shipwreck that archaeologists excavated for the laboratory, the archaeologists concluded that the ship could have been deliberately sunk to prevent it from being seized by the enemy since it was anchored and close enough to the coast for the crew to swim ashore (Nosengo, 2010). As a consequence, if the shipwreck is so close to the shore that a man can swim to it, it could occasionally suffer the problem of disturbance by divers or treasure hunters. In this case, the recovery of ingots by the museum would have already been necessary even without an agreement with the museum. In addition, since it was carried out by the archaeologists, it is supposed to have followed archaeological standards. However, if the recovery is carried out by private companies, the method is controversial.

II.4.1.8. Keeping collections together

Article 18.4. A State Party which has seized underwater cultural heritage shall ensure that its disposition be for the public benefit, taking into account the need for conservation and research; the need for reassembly of a dispersed collection; the need for public access, exhibition and education; and the interests of any State with a verifiable link, especially a cultural, historical or archaeological link, in respect of the underwater cultural heritage concerned.

The UNESCO Manual (Guerin and Egger, 2011) states in Article 34 that the archive has to be kept together “as far as possible”. If the ingots are separated from the main collection this would be contravening this article of the Convention.

II.4.1.9. Activities incidentally affecting underwater cultural heritage

Article 5. Activities incidentally affecting underwater cultural heritage: Each State Party shall use the best practicable means at its disposal to prevent or mitigate any adverse effects that might arise from activities under its jurisdiction incidentally affecting underwater cultural heritage.

It seems that at the time of the drafting of the Convention, the negotiators thought that regulating all the activities in the maritime zone would be too complex (O’Keefe, 2002). O’Keefe believes that the article is aimed at reaching a balance between continuation of the activities and protection of the underwater cultural heritage and to remember that States have as an imperative prevent or mitigate the adverse affects of these activities. Recovery of ingots can be mitigated by States if agreements enforce archaeological standards.

II.4.2. 1982 UNCLOS Convention

This Convention also covers some concepts expressed in the articles which affect indirectly the use of ancient lead:

II.4.2.1. Right of salvage.

Article 303.3. Nothing in this article affects the rights of identifiable owners, the law of salvage or other rules of admiralty or laws and practices with respect to cultural exchanges.

As mentioned in the Literature Review (Chapter 2), salvage is an old concept of maritime laws which rewards the salvor when recovering objects from the bottom of the seas. According to Forrest (2003), archaeologists believe that the application of law of salvage

has three main consequences for underwater cultural heritage: (1) the granting of ownership of artifacts to salvors *in lieu* of a salvage award, (2) the splitting up of collection, and (3) the excavation techniques required to minimize commercial costs and maximize the salvage award. He also highlights:

[S]alvage law is at odds with the preservation of underwater cultural heritage. This does not mean that underwater cultural heritage does not, or should not, embody an economic value only that salvage law as the means of realizing that economic value, is inappropriate because it causes an imbalance between the realization of the economic and archaeological values of the underwater cultural heritage.

The 2001 UNESCO Convention already condemned the law of salvage stating:

Article 4 –Any activity relating to underwater cultural heritage to which this Convention applies shall not be subject to the law of salvage or law of finds, unless it:

- (a) is authorized by the competent authorities, and
- (b) is in full conformity with this Convention, and
- (c) ensures that any recovery of the underwater cultural heritage achieves its maximum protection.

As a consequence, and although the recovery of ancient lead by private companies would be protected under the umbrella of the law of salvage of the UNCLOS Convention, the 2001 UNESCO Convention would not agree with this practice. However, as we saw in the Literature Review (Chapter 2), UNESCO acts under the shadow of UNCLOS, and as a consequence, the law of salvage is used by private companies in order to recover ancient lead from a shipwreck.

II.4.2.2. Marine scientific research

The other term that would present a contentious issue under the law is *marine scientific research*, which is covered by Part XIII of the Convention. Does it relate to scientific marine research *about* the marine environment, executed *in a* marine environment or *using*

the marine environment? (Perez-Alvaro and Gonzalez-Zalba, 2014b). This distinction could change the protection of underwater cultural heritage against or in favour of its use for other purposes. Part XIII of the Convention states that all states have the right to conduct marine scientific research in the case of territorial seas, Exclusive Economic Zones and the continental shelf with the consent of the coastal State and freely in the high seas in the Area. If the recovery of underwater cultural heritage for scientific purposes is considered marine scientific research, it will be free for all the States in the Area and high seas and under the permission of the Coastal States in the rest of the maritime zones.

In principle, the negotiations of this Convention lead us to think that exploration and research of underwater cultural heritage were not considered scientific research. However, the Convention was negotiated when underwater archaeology was still a newly formed discipline. Nowadays, new uses of the oceans have been addressed and technology has allowed the discovery and reaching of deeper shipwrecks which changes the panorama and the definition of marine scientific research.

In order to establish if the use of underwater cultural heritage for dark matter experiments is marine scientific research, we need to establish if:

- (a) dark matter experiments using objects belonging to the sea are “marine scientific research”;
- (b) underwater archaeology is marine scientific research.

However, establishing these concepts is a difficult task since UNCLOS does not define marine scientific research. At most, the Convention makes passing references to scientists “studying the essence of phenomena and processes occurring in the marine environment and the interrelations between them” (Article 243) and projects “carried out in

accordance with this Convention exclusively for peaceful purposes and in order to increase scientific knowledge of the marine environment for the benefit of all mankind” (Article 246.3). Both definitions could well include both, dark matter experiments and underwater archaeology. A study by the Convention of the Biological Diversity (1993) secretariat and the UN Division for Oceans and the Law of the Sea developed the following approach:

Marine scientific research could be defined as an activity that involves collection and analysis of information, data or samples aimed at increasing humankind’s knowledge of the environment, and is not undertaken with the intent of economic gain.

Soons (1982) interprets marine scientific research to be defined as increasing man’s knowledge of the marine environment, with the marine environment *as an object*. He exposes that marine geology and geophysics deal with the deeper structure of the ocean floor and its physical properties (which is what dark matter deals with). In Churchill and Lowe’s opinion (1999), marine scientific research may also help to explain more about the earth generally. Dromgoole (2010) defends that the term encompasses scientific research directed *at* the marine environment, rather than *in* it. However, Oxman (1988: 353) establishes that

[a]lthough the Convention does not define marine scientific research, the provisions of Part XIII establish that the articles relating to marine scientific research deal with the search for knowledge about the natural marine environment or, in the words of article 243, "phenomena and processes occurring in the marine environment and the interrelations between them."

Soons (1982) establishes a list of what should be considered as marine scientific research (Figure 4.II.7.): physical and chemical oceanography, marine biology, and marine geology and geophysics, the last one being the most applicable on dark matter. For the author, archaeology would also be marine scientific research, since a geophysical survey

could be used to analyze potential petroleum reservoirs and mineral deposits, locate groundwater, find archaeological relics or determine the thickness of glaciers.

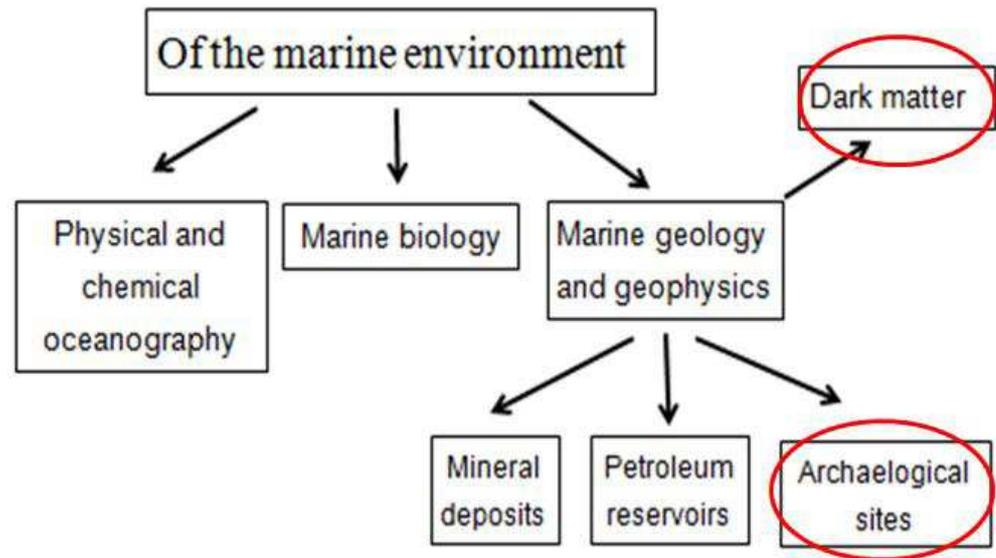


Fig 4.II.7. Soons' (1982) marine scientific research ideas. Information compiled by the author.

In other words, both underwater archaeology and dark matter research are part of geophysical research and as a consequence, are included in the definition of marine scientific research. The experiments on dark matter research aimed to discover the origins of the universe are protected under the umbrella of Part XIII of the 1982 UNCLOS Convention.

However, Article 263.2 (responsibility and liability) of the Convention establishes that States are responsible for the acts of juridical persons or competent international organizations in any damage done by marine scientific research. As a consequence, in reference to underwater archaeology marine scientific research, the State will be responsible for the illegal recovery of any archaeological objects carried out by private

companies even if it is intended for marine scientific research other than dark matter experimentation.

II.5. Ethical dilemmas on use

The deal between the Museum of Cagliari and the laboratory opens a new window not only for the realm of physics, but especially and mostly for the realm of underwater cultural heritage management. If this interchange is licit and beneficial both for the dark matter discoveries and for the preservation of underwater cultural heritage it is a matter, again, of prioritizing values. Maybe, it is not a matter of eradicating one of the values. It is possible that of all the competing values inherent in cultural heritage, the archaeological and historical evidence derived can take preference, which is not to say that the others should be ignored.

However the case of the use of lead for particle physics experiments is only one of the various examples of how laboratories in different industries deal with the issue and recovery of the lead. In this regard, we are now going to discuss the main dilemmas surrounding the case: the extent of the uses of underwater cultural heritage and the different means of recovering this heritage.

II.5.1. Use

Opening the door for the use of underwater cultural heritage to all those that need it, only to some or even to none, is the first ethical dilemma to consider.

II.5.1.1. No uses allowed

For some authors, giving away any underwater cultural heritage in favour of scientific experimentation of any kind would open a window to a market difficult to regulate: “where does it all stop, if we accept that evidence of our past can be converted into something that

people can buy and take home?” (Pringle, 2013: 804). This is, as a consequence, a matter of valuation of this heritage, which has been discussed in the Literature Review (Chapter 2). Some other arguments against its use are:

(1) Decision on excavations. Usually, selecting an archaeological site to excavate depends both on the importance of the site and on the degree of danger that the site faces if disturbed (Manders *et al.*, 2012). If sites start to be chosen depending on the quantity of lead in them, it will only lead to investigation for profit, and not for knowledge.

(2) Information on the future. Since ingots are melted, they are destroyed. However, in the future, new developments in knowledge and technology could obtain new information from them if they still existed.

(3) Future lead. Currently manufactured lead cannot reach the same amount of purity as ancient lead. However, maybe in the future it will. In addition, new material can be manufactured to reach the same properties.

(4) New materials. Tungsten is a material that can be purified to similar levels of radioactivity (Danevich *et al.*, 2003). Currently it is not commercially available and production costs are undetermined. However, such experiments could take place in the future.

These arguments would rule out the possibility of using underwater cultural heritage for experimentation in science. However, not all decisions are black or white as we shall proceed to assess.

II.5.1.2. Only justified uses allowed

Research on dark matter aims to answer one of the most important questions that modern astronomy, and humanity, is facing: what is our universe made of? This question is expected to be answered by understanding the properties of dark matter.

However it is not only this science that needs ancient lead to build a shield against radiation. Perez-Alvaro and Gonzalez Zalba (2014) post other examples:

The scientific interest in pre-World War II steel from historical submarines and battleships has transcended its historical interest to be used in other domains, for example, medical research: 65 tons of steel from USS Indiana, scrapped in 1962, was used for shielding at an Illinois Veterans Administration hospital, and another 210 tons went into building a shielded room for in vivo radiation measurements at a Utah medical centre (Lynch, 2007, 2011). Equally, steel salvaged from Scapa Flow shipwrecks has been used in low radiation detectors (Butler, 2006).

Even if shipwrecks from the World War II are still not underwater cultural heritage for not being under water more than 100 years, they will become so in 30 years. In addition, they are tombs of deceased sailors. However, the quandary is if it is more important to preserve those shipwrecks and show respect to the deceased than developing medical technologies that could help to save lives in the future.

The debate of archaeologists as “owners” of underwater cultural heritage has been largely discussed (Scarre and Scarre, 2006; Carman, 2002). The Society for American Archaeology recognizes archaeologists as “stewards” of the cultural heritage (SAA, 1990: 11):

Principle No. 1: Stewardship. The archaeological record, that is, *in situ* archaeological material and sites, archaeological collections, records and reports, is irreplaceable. It is the responsibility of all archaeologists to work for the long-term conservation and protection of the archaeological record by practicing and promoting stewardship of the

archaeological record. Stewards are both caretakers of and advocates for the archaeological record for the benefit of all people; as they investigate and interpret the record, they should use the specialized knowledge they gain to promote public understanding and support for its long-term preservation.

Therefore archaeologists have a responsibility to use their influence and specialized knowledge to protect heritage as stewards of the heritage. In this regard, it is worth comparing the situation with politicians. If politicians are stewards of a country, and theoretically they are prepared academically, professionally and by experience to be so it would be unimaginable that this task were going to be taken by an unqualified plumber or an unqualified writer. Heritage, following this example, should be managed by experts in the field and this should not lead to problems of ownership of this heritage.

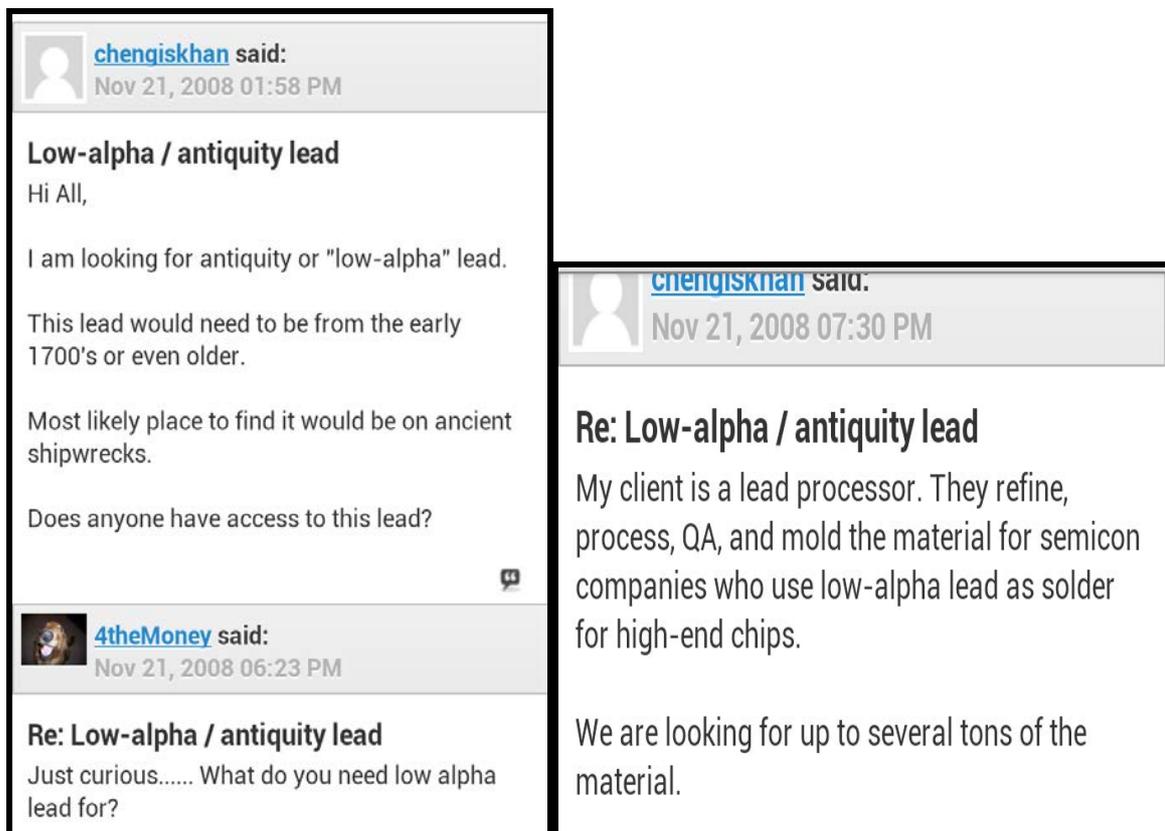
As a consequence, it is necessary not to confuse “stewards” with “owners”. There is a good example in the case of the Human Genome experiments that have proprietary rights to the researchers but are intrinsic to every human being and as a consequence should be seen as Common Heritage of Humankind (Sturges, 1998). The Human Genome faces, as well, the same problem as underwater cultural heritage: it cannot be researched if it does not attract investors and allow them to make a profit. The crossroad is research with funding or survival without it. The Human Genome has chosen the first option: being funded, allowing a profit, but being for the benefit of humanity (Sturges, 1998: 223). Researchers are only stewards of the human genome as archaeologists are on the heritage.

II.5.1.3. All uses allowed

The use of ancient lead is becoming popular not only in dark matter experimentation but in other scientific fields such as microelectronics (Tong *et al.*, 2013) and low background detectors (Perez-Alvaro and Gonzalez-Zalba, 2014). The quandary, as a consequence, is

not the use of ancient lead for dark matter experiments alone but the growing use of this material for other kinds of experiments from medicine to microelectronics.

Although dark matter laboratories may produce an economic benefit at the end of their research (sponsorships, scholarships or publishing) their primarily goal is not motivated by profit but by knowledge. However, other industries in search of ancient lead, such as the microelectronics industries (Perez-Alvaro and Gonzalez-Zalba, 2014), being private, aspire to gain an economic profit: their knowledge will not necessarily be for the benefit of humanity. Figure 4.II.8. illustrates part of a conversation in a forum on low-alpha lead. As it shows, the interest by the buyer is on high-end chips and they are for several tones of the material likely to be found on ancient shipwrecks.



The image shows a screenshot of a forum thread. The first post is by user 'chengiskhan' on Nov 21, 2008 at 01:58 PM. The post title is 'Low-alpha / antiquity lead'. The text of the post reads: 'Hi All, I am looking for antiquity or "low-alpha" lead. This lead would need to be from the early 1700's or even older. Most likely place to find it would be on ancient shipwrecks. Does anyone have access to this lead?'. The second post is by user '4theMoney' on Nov 21, 2008 at 06:23 PM. The post title is 'Re: Low-alpha / antiquity lead'. The text of the post reads: 'Just curious..... What do you need low alpha lead for?'. The third post is by user 'chengiskhan' on Nov 21, 2008 at 07:30 PM. The post title is 'Re: Low-alpha / antiquity lead'. The text of the post reads: 'My client is a lead processor. They refine, process, QA, and mold the material for semicon companies who use low-alpha lead as solder for high-end chips. We are looking for up to several tons of the material.'

Fig 4.II.8. Image I of a forum on low-alpha lead declaring other uses
Available at: <http://www.minelabowners.com/forum/showthread.php?t=25099>

It is necessary to evaluate and weigh the loss (of humanity) against the gain (of knowledge). If the balance in some industries will not gain enough knowledge to justify the loss, ancient lead should not be used.

II.5.2. Recovery

The debate is not only around the loss of cultural material, but also around how the material is recovered to avoid the loss of information. The other ethical concern is the way that the underwater cultural heritage is recovered for those experiments.

II.5.2.1. By private companies or black market

As said, there are around nine laboratories around the world needing ancient lead for their experiments (Perez-Alvaro, 2013). And only one has been known to reach an agreement with a museum.

Ancient lead has a market whether recovered legally or recovered illegally. There is a general concern because sources are not only limited to shipwrecks but also other sources such as lead obtained from water pipes in ancient Roman cities or lead on the roof of old churches. AFAIR, for instance, is a company that offers to re-roof old churches free if they can keep the old lead removed (Perez-Alvaro and Gonzalez-Zalba, 2014). However, according to Lee (2000), a third of low alpha lead is obtained by sea salvage companies from the sea, for instance *Aloveo* and *Sea Recovery Ltd*. In fact, the private company Odyssey Marine Exploration operates in the same business (Channel, 2009): “turning lead into gold” is their motto. Private companies have identified or located about 600 tonnes of ancient lead (Lee, 2000). Commercial salvors target materials whose sale will give them a benefit well above the cost of recovery (Fenwick and Gale, 1998) and ancient lead has

been discovered to be one of these materials: easy to track with metal detectors and expensive to sell.

The main issue according to Throckmorton (1998: 81) is that the most inefficient treasure hunt spent \$500,000 for 16 days at sea. As a consequence, private companies have to hasten their recovery in order to gain an economic benefit.

However, it is not only dedicated private companies in this business. Just by a quick search on Google with the words “low-alpha lead” it is possible to find forums for the sale and purchase of ancient lead. Figure 4.II.9. shows the conversation on one of these forums on low-alpha lead. The seller has access to more than 3.5. tons of this material for \$21/pound.

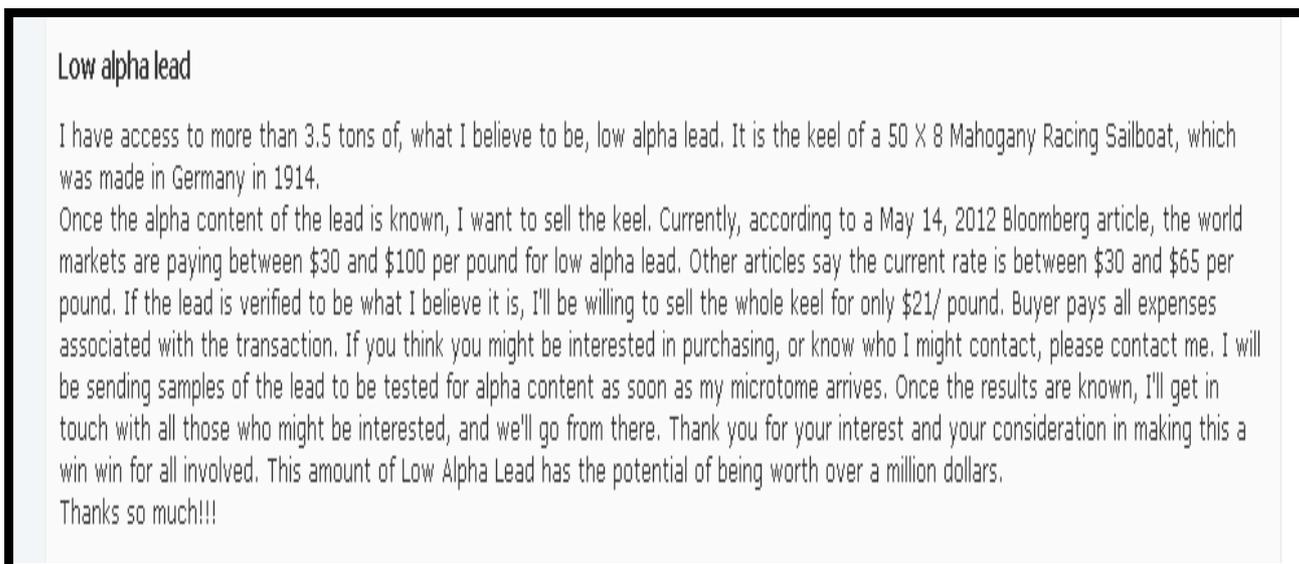


Fig 4.II.9. Image II of a forum on low-alpha lead black market
Available at: <http://www.alloyavenue.com/vb/showthread.php?7341-Low-alpha-lead>

As a consequence, and as we have demonstrated, this market is becoming more appealing for more groups and industries (Pringle, 2013).

II.5.2.2. By archaeologists

Archaeologists study the wreck to get the maximum information about the wreck site as there is usually only one opportunity to record it accurately (Fenwick and Gale, 1998).

The vessel used for the experiments in Grand Sasso was found by a scuba diver in 1991 30 meters deep. It was a *navis oneraria magna*, built between the year 80 and 50 BC. The vessel came from Cartagena (Spain) and it was heading to Rome. Besides the ingots of ancient lead, other artifacts were found, like amphorae and anchors. Every ingot had an inscription: *Carulius Hispalus*, corresponding to an Italian family that exploited mines in Spain (M.R.E., 2010). This information has been obtained because the shipwreck has been properly studied and recorded by archaeologists and objects on board have been recovered and analyzed.

Study and documentation of the shipwreck site are essential for the recovery of information (Villegas Zamora, 2008: 20). The archaeological practice is a process that reconstructs the puzzle of history. For instance, the position of objects sheds light on the circumstances of the wreck. As a consequence, the archaeological context is essential for obtaining information. Only the adequate process of study, analysis and excavation guarantees the correct interpretation of the objects. And even if the procedure is followed, recovering and destroying the object (even if due record is kept) still eliminates evidence of our past that new technology in the future could re-interpret or re-discover.

When the cargo from the shipwreck was discovered, the Museum of Cagliari did not have enough funds to research the archaeological site, so it was thought that Italy's National Institute of Nuclear Physics (INFN) contributed 300 million lira (US\$210,000) to the operation. In exchange, a proportion of the recovered lead (a 20%) would become

available for the physicists' experiments (Nosengo, 2010). However financing underwater archaeological research in exchange for material recovered was controversial (INFN, 2010).

Funding archaeological research is not the main issue. Archaeological research is a largely commercialized practice and the source of income has passed from governments to the private sector (Aitchison, 2009). The problem is that even if the archaeological record is perfectly executed, the exchange results in the loss of ingots (underwater cultural heritage objects). A similarly controversial issue rose with the agreement between the UK Government and the marine exploration company Odyssey that stated that the objects found on the Sussex shipwreck would be shared between the parties (Government and private company) with the artefacts of cultural significance going to the Government (Dromgoole, 2004). The company, however, would keep "trade objects", such as coins. It was said that museums would not be interested in a large volume of coins (Dromgoole, 2004).

In this regard, some authors (Stemm, 2000) differentiate between cultural artifacts and trade goods (replicated items), under considerations such as age, rarity and condition (Stemm, 2000). For him, these objects could be sold if properly excavated and recorded, for instance coins or ingots (a 1000-ingot shipwreck cargo, 300 already recorded being used and destroyed). In addition, it has also being established that lead was only in the shape of ingots for transportation on the ship (Gale, 2001). They were "half products" and not final products that needed to be preserved since they were going to be transformed into something else.

II.6. Conclusions

Ancient lead can reach unprecedented levels of low intrinsic radioactivity necessary for dark matter researches. A combination of natural radioactive decay, ancient ore refining and preservation under water have reduced the ^{210}Pb intrinsic radioactivity by a factor of 100,000 when compared to freshly mined lead. For a given initial level of purity and preservation conditions, the more time that has passed since it was originally processed, the lower its intrinsic radioactivity. Current manufacturing capabilities cannot achieve comparable radioactivity levels but approach the required experimental limits.

This chapter has aimed to raise awareness on the use of ancient lead for particle physics experiments in particular but also for other sciences in general and its consequences from a particle physics and from a cultural heritage perspective. The state of the dilemma lies in the fact that although the use of underwater cultural heritage on scientific experiments is an irreversible process, some of the uses may not be contravening any Convention. As a consequence, two main concepts have been highlighted as the main ethical conflicts on the issue:

(1) Use: it is necessary to set boundaries and to decide which science “deserves” a part of the past. It might be decided that underwater cultural heritage is not a stock for any kind of experiment or that only experiments aimed to cure diseases will be allowed. It might instead be decided that if the experiments offer answers for the knowledge of mankind are justified, or that it is worth widening the range of experiments to include businesses such as microelectronics. And this would entail the risk of allowing any kind of industry to use underwater cultural heritage (Perez-Alvaro and Gonzalez-Zalba, 2014).

(2) Recovery: it needs to be carried out under archaeological standards: archaeology fundamentally obtains information about the history of humankind. Only archaeological methods and techniques for analyzing and excavating an archaeological site will guarantee as full as possible an interpretation of the objects recovered. Even if accepted procedures are followed by archaeologists and experts, the fact that the ingots have to be melted and lost in order to conduct particle physics experiments destroys evidence. Technological advances in the future could produce more information from these items. As a consequence, following the archaeological procedures on the recovery of the ancient ingots mitigates the damage, but there is still damage. On these grounds, the use of ancient lead bricks from underwater cultural heritage sites to perform experiments that require lead to be melted and destroyed, may result in the loss of knowledge in two different ways:

(2.1.) Current loss of information, which is avoidable: if laboratories obtain ancient lead from private companies whose protocol is getting the lead without keeping an appropriate archaeological record, knowledge about our past and about our history is being lost. For those companies, the more time spent on a site, the less the profit: it is “the dollar over the data” (Coroneos, 2006: 120), and as a consequence they pay no attention to archaeological data or to gathering information. Once the objects are decontextualized, the information, which is non-renewable, is lost (Gerstenblith, 2007). If the laboratories, instead of looking for private companies, were to reach an agreement with a team of archaeologists, at least this process of gathering information and understanding the context of the pieces would follow the archaeological process.

(2.2.) Loss of information in the future: it is necessary to keep it up to a minimum. Even if the archaeological process is followed, the lead ingots are melted by the laboratory. In the future, with more information, more scientific development and more archaeological data, new theories, knowledge and interpretations can arise from the analysis of ancient lead from shipwrecks, such as commercial trade routes. However, if this material is destroyed, we will lose the chance to obtain that information.

On these bases, the legal analysis of both, the 2001 UNESCO Convention and the UNCLOS Convention have now reached different conclusions, illustrated in Table 4.II.1. As we can see, the archaeological recovery of the ancient lead for particle physics experiments is the only case that complies with most of the precepts established by both the 2001 UNESCO Convention and the UNCLOS Convention. However, four main concepts are contravened on this option: the preservation *in situ* (that, as explained, is a desirable option but not the only option), the use of the ingots as transaction material, the integrity of the material that is melted and destroyed and the idea of keeping the collections together. On the other hand, the recovery of ancient lead also for particle physics experiments but by other means other than archaeological, does contravene every main concept of these two conventions except that the experiments are still for the benefit of humanity and of scientific interest, and they can still be considered “marine scientific research”. However, it is the use of ancient lead for other purposes other than for scientific interest (especially for those uses that generate an economic profit) the ones contravening each one of the eleven concepts that we have established as essential in the management and protection of underwater cultural heritage and that are supported by the various articles of the Convention.

	PARTICLE PHYSICS EXPERIMENTS		OTHER USES FOR ECONOMIC PROFIT
	ARCHAEOLOGICAL RECOVERY	NOT ARCHAEOLOGICAL	ANY RECOVERY
1. Benefit of humanity	✓	✓	X
2. Preservation <i>in situ</i>	X	X	X
3. Scientific interest	✓	✓	X
4. Not trading objects in exchange for funding for excavations	X	X	X
5. No commercial exploitation	✓	X	X
6. Integrity of the material	X	X	X
7. Archaeological recovery of the material	✓	X	X
8. Keeping collections together	X	X	X
9 Legal activities but incidentally affecting the heritage	✓	X	X
10. Avoidance of law of salvage	✓	X	X
11. Marine scientific research	✓	✓	X

Table 4.II.1. Table of legal dilemmas and its compliance

However, as we have seen, the ethics around the issue become blurred when talking about “right” or “wrong” ownership or stewardship, or commercialization or scientific study of the underwater cultural heritage. If the international community allows corporations or private laboratories to make decisions regarding the use of underwater cultural heritage as a source of experiments, the decision of these institutions would be based on economic principles. Only under the umbrella of the States or the international community would the use of the material be purely for knowledge.

The scientific community in need of ancient lead also has to have their efforts directed to create new materials with the same properties. Ancient lead is a non-renewable source. However, renewed mass-production techniques or alternative materials, such as tungsten, could be explored if these activities were to expand. However, sometimes it is necessary to admit that the heritage may suffer some loss to the benefit of another kind of knowledge. It is what has been called “offset” heritage. However, its use, also acceptable, has to be regulated.

The establishment of a protocol on ethically accepted scientific experiments using underwater cultural heritage would represent an effort to begin discussions. The worldwide community can then proceed to make decisions about a balance between heritage and science in relation to its collective ethical beliefs. Our proposal is to configure those moral concerns in a legal protocol to limit the use of underwater cultural heritage for scientific purposes and, when used, to manage it under archaeological standards, with archaeologists as stewards.

II.7. Proposal

This study proposes an implementation of a protocol establishing certain rules for the use of underwater cultural heritage for scientific purposes. There is a danger of uncontrolled activities on shipwrecks to extract ancient lead for particle physics experiments. Even if the problems can be resolved by adopting a case-by-case evaluation, there is a possibility of an increase in the use of the material for other kinds of experiments. As a consequence, a jurisdiction should regulate it so the extraction and use of the heritage could be conducted in a regulated form, in the same way that the use of animals is controlled for biological experiments.

Our proposal will be to apply a similar protocol to that on experimentation with animals. The European Union established the *Council Directive 2010/63/EU Act* (Directive, 2010) to protect animals used for experimental or scientific purposes by ensuring that they are adequately treated and that no unnecessary pain or suffering is inflicted. The reason for choosing the protocol on animals is because it is applicable to our purpose, for the following reasons:

1. In both scenarios the elements will be used for scientific experimentation. The final aim of these activities is the search for new knowledge. Ultimately the animal or the underwater cultural heritage object is lost during the process.
2. Like scientific experimentation with animals, dark matter is a new frontier that may result in beneficial knowledge for humankind. The search for knowledge and new discoveries advance more rapidly than the ethical protocols or the laws regulating them.

3. There is a need to comply with the intent of international collaboration.

Establishing a protocol assures that every nation is contributing to science and heritage likewise.

Four main articles of the protocol for the protection of animals could be applied in the case of the underwater cultural heritage:

a) Purposes of uses:

Article 5. Purposes of procedures.

Procedures may be carried out for the following purposes only:

- (a) basic research;
- (b) translational or applied research with any of the following aims:
 - (i) the avoidance, prevention, diagnosis or treatment of disease, ill-health or other abnormality or their effects in human beings, animals or plants;
 - (ii) the assessment, detection, regulation or modification of physiological conditions in human beings, animals or plants; or [...]
- (c) for any of the aims in point (b) in the development, manufacture or testing of the quality, effectiveness and safety of drugs, foodstuffs and feed-stuffs and other substances or products;
- (d) protection of the natural environment in the interests of the health or welfare of human beings or animals;
- (e) research aimed at preservation of the species;
- (f) higher education, or training for the acquisition, maintenance or improvement of vocational skills;
- (g) forensic inquiries.

The animals' protocol clearly establishes the purposes where the use of animals is allowed. In the same way, a protocol for uses of underwater cultural heritage should list the specific cases where its utilization is allowed, such as treatment of disease or research aimed at preservation of other underwater cultural heritage.

b) Competence of professionals:

Article 23. Competence of personnel

[...] 2. The staff shall be adequately educated and trained before they perform any of the following functions:

- (a) carrying out procedures in animals
- (b) designing procedures and projects;
- (c) taking care of animals
- (d) killing animals

Persons carrying out the functions referred to in point (b) shall have received instruction in a scientific discipline relevant to the work being undertaken and shall have species-specific knowledge.

Staff carrying out functions referred to in points (a), (c) or (d) shall be supervised in the performance of their tasks until they have demonstrated the requisite competence.

[...] 3. Member States shall publish, on the basis of the elements set out in Annex V, minimum requirements with regard to education and training and the requirements for obtaining, maintaining and demonstrating requisite competence for the functions set out in paragraph 2.

Personnel managing underwater cultural heritage should be educated and trained before rescuing any underwater remain. In addition, any archaeological excavation should be authorized and decided by the State administration. In all cases the use and preservation of shipwrecks as a source for experiments shall be monitored by a competent authority to prevent avoidable damage or destruction.

c) Complete release of information about the experiments:

Article 13. Choice of methods:

[...] 2. In choosing between procedures, those which to the greatest extent meet the following requirements shall be selected:

- (a) use the minimum number of animals;
 - (b) involve animals with the lowest capacity to experience pain, suffering, distress or lasting harm;
 - (c) cause the least pain, suffering, distress or lasting harm;
- and are most likely to provide satisfactory results. [...]

Experiments should be regulated and the amount of material necessary for the experiments should be reported to authorities. In addition, information stating the specific shipwreck to be researched, the kind of cargo carried and the team of experts that are going to carry out the excavations should be declared. Archaeologists, on the other hand, shall only provide the material if the shipwreck has been archaeologically studied, recorded and excavated.

d) Grace of necessity of the material (only if absolutely necessary):

Article 4. Principle of replacement, reduction and refinement

1. Member States shall ensure that, wherever possible, a scientifically satisfactory method or testing strategy, not entailing the use of live animals, shall be used instead of a procedure.
2. Member States shall ensure that the number of animals used in projects is reduced to a minimum without compromising the objectives of the project. [..]

Underwater cultural heritage should only be used if there is evidence that the activity is absolutely necessary and there is no other way of obtaining the same scientific results. Experiments must only take place if there is no alternative method that does not entail the use of underwater cultural heritage or if the alternative method is proved to be well out of the laboratories' reach.

III. Management: watery graves

III. Management: watery graves

The chapter deals with ethical issues on the protection of human remains contained in underwater cultural heritage. In this regard, it looks both at those shipwrecks that still conserve human remains and those where the remains have disappeared but where once there. In addition, it deals with the definition of the term “underwater cultural heritage” by the 2001 UNESCO Convention and the lack of recommendations by legal instruments for the treatment of these remains.

III.1. Introduction

The treatment of human remains is one of the most complex areas of archaeology (land and underwater) (Mays, 2008). Its management depends both on legal and ethical considerations. However, the debate has been largely forgotten by the maritime archaeology bibliography (Mays, 2008). Although this controversy has been largely discussed for land archaeology (see, for instance, Cassman *et al.*, 2007), marine contexts are different and deserve special consideration²⁰. Shipwrecks are usually caused by catastrophes that in most cases also cause deaths, mostly fatalities claiming several lives (Perez-Alvaro, 2013c). Vessels were used to transport passengers and cargo and were operated by a crew so every ship, big or small, contains human lives. The event that usually converts a vessel into a shipwreck is an accident (Aguilar, 2013); an accident that provides us with a document of scientific value and with a direct connection with the past (MacLeod, 2008). For Flatman (2007: 81) shipwrecks have an inherent “stench of the morgue”, even if they have not caused a loss of life. However, as Forrest (2010) reminds

²⁰ Differences between treatment of human remains on land archaeology and human remains on marine archaeology will be discussed below, under the section “dilemmas” on this chapter.

us, the distinction between human remains and cultural heritage is blurred, especially in the cases of very old remains, for instance mummified remains.

However, not in all shipwrecks are the human remains preserved. As a consequence, two different situations can be found:

1. If human remains are still preserved on the shipwreck, three options on their management arise: leaving them untouched, recovering them or managing them, creating an underwater cemetery or memorial. This last option, the treatment of shipwrecks as graveyards and memorials is an option that has started to be considered by the bibliography as well as by practical examples. The recognition of a wreck as a resting place for human remains acknowledges the need for a treatment of respect. The treatment of shipwrecks as watery graves has proved to be effective for protection in some countries, although it is still controversial (Perez-Alvaro, 2014).
2. On the other hand, if there are no human remains preserved but there were human bodies on the shipwreck, we would be dealing with absent/invisible/intangible heritage and the management would be different, as we will see in the proposal.

This chapter is devoted to untangling the issues concerning the treatment of human remains as part of an underwater cultural heritage site. The first part of the chapter will look at the issues that make the subject so complex. After that, some technicalities concerning the preservation of human remains under water will be explained. Perspectives from a legal point of view will be looked at in the following section, examining both international and national attitudes.

The main part of this chapter will be under the heading “dilemmas” and “proposal” that will look at the ethical issues surrounding the treatment of human remains on shipwrecks followed by some proposals for the treatment of those remains. In addition, in this chapter, a special mention will be made for a shipwreck that is perfectly preserved and contains human remains, and that, in addition, is a source of income in tourism as underwater cultural heritage: the *USS Arizona*, off the coast of Hawaii, is an example of the preservation of a shipwreck, respect for the dead, commemoration of the event and enhancement as a touristic attraction.

III.2. Issue

Management and protection of human remains as part of underwater cultural heritage is a complex ethical issue (as it is in land archaeology) untangled with technical considerations for being underwater. The problem in underwater cultural heritage is that being a relatively new discipline, the issues are starting to appear now, as opposed to land archaeology that has already faced these issues some time ago. However, underwater heritage managers cannot find all the answers in land heritage since both archaeologies (land and underwater) face different situations:

(1) The first difference that we find underwater human remains in respect to land human remains is the cause of death. Usually on shipwrecks all died at once and for the same reason. It is not common to find shipwrecks with only one or two bodies on board. Usually shipwrecks are a consequence of accidents and create catastrophes. In fact, Mays (2008) categorises human remains in archaeological sites into attritional (burials accumulated over a period of time with varying causes of death) and catastrophe samples (individuals died at the same time, sharing a common cause). Human remains on

shipwrecks are included in the last type. On land, battlefields, disasters or fires are the only examples of this type.

(2) There is a second main difference. Establishing identities of the human bodies on shipwrecks can be easier than in land archaeology, since, although depending on the period, in most cases passengers and crew were registered in the log books of the ship.

(3) A third main difference is that microbial destruction of bone in maritime contexts differs from those buried on land (Mays, 2008) and, as a consequence, preservation and treatment has to be different. In a maritime environment, for instance, human remains tend to be incomplete and co-mingled (Mays, 2008) with some other remains floating freely away from the ship. In land archaeology, with exceptions such as prehistoric tombs or the Towton mass grave (Sutherland and Schmidt, 2003), human remains tend to be preserved together.

(4) The final difference is that it is more difficult for families to pay their respects to their relatives when in the ocean, since some parts of the ocean are practically inaccessible. For families, a wreck may represent the last resting place of those that perished but can be a place that they will not be able to visit (Perez-Alvaro, 2011). Some land sites may also be difficult or impossible to access, although is not the usual situation.

As a consequence, various dilemmas arise from the underwater cultural heritage realm, which requires a lot of analysis before offering possibilities (Perez-Alvaro, 2013c). A ship is a mobile means of transport usually carrying people of different cultures on board, which could have sunk in the waters of the flag state, other nation's waters or high seas' water and these factors load the issue with several complexities.

In addition, there is not a specific legislation dealing with the treatment of human remains on shipwrecks. Nevertheless, the *2001 UNESCO Convention on the Protection of the Underwater Cultural Heritage* includes in its definition the term human remains, which means that the same guidelines for the protection of underwater cultural heritage (for instance, preservation *in situ* and for the public benefit) are also applicable to human remains.

Any policy making or management decision on underwater cultural heritage often faces complicated and delicate decisions. However, the management of human remains implies an emotional component that has to be looked at through various values contained in ethical principles. The protection of human remains contained in underwater cultural heritage reveals differences in the management between countries established by aspects of culture, such as tradition, mentality or habit (Perez-Alvaro, 2014). Consequently, states develop their policies according to their collective values (human remains and the rest of underwater cultural heritage) and those values are the ones that decide what deserves to be preserved. Only by recognition, human remains transform from trash to grave sites. The different options when finding a shipwreck with or without human remains (excavating it any way, leaving it as a watery grave, recovering the human remains...) will depend on the archaeologists. Its management after the remains are recovered will depend on museum managers (O'Keefe, 2002).

III.3. State of knowledge

The very first question should be related to the possibility of finding human remains under water on a submerged archaeological site. It is confirmed that human remains can still be found at sites that are several hundred years old (Dromgoole, 2013), although skeletal remains are the only human remains usually found (soft tissues discoveries are exceptional

(Mays, 2008)). However, the preservation of human remains depends on various factors and environmental conditions. Its deterioration can be due to different processes, such as impacts with rocks when the shipwreck, encrustation by organisms or sediments that abrade the surfaces of the bones (Mays, 2008). At the end of the day, shipwrecks have many causes: storms, damaged hulls, poor navigation or collision with other ships or with objects for instance (Fenwick and Gale, 1998).

Cunningham and Tolson (2010) state that the normal changes and decomposition of a body are delayed in cold, deep water so that bodies may be surprisingly well preserved after a long period of immersion. Although biological activity results in advanced decomposition within 12 years, even in cases of the most durable skeletal parts (Cunningham and Tolson, 2010), some human bones on shipwrecks are preserved if and when the body became trapped below deck (for instance, beneath a cannon or the cargo). This situation prevents degradation of the remains until a sealing layer is deposited to conserve it within an anaerobic environment (Cunningham and Tolson, 2010). Therefore, the degree of preservation will depend on whether the burial site is oxygen free (for more reference, see at preservation of bone in climate change Chapter (4.IV.) in this volume) and how quickly the remains become sediment-inundated. However, for Pickford (1994) it is the exception and not the rule for bodies to be trapped inside a hull, since this usually happen when the sinking is very quick. According to him the vast majority of people lost at sea float free from the ship itself.

MacLeod (2008) sets out some examples of preserved shipwrecks containing human remains:

- *The Mary Rose* (1545): The *Mary Rose* was built in Portsmouth between 1509 and 1511 and it sank during an engagement with the French fleet. The surviving section

of the ship was raised in 1982 and is now on display in *Portsmouth Historic Dockyard* along with an extensive collection of well-preserved artefacts. 179 human remains were recovered as skeletal material and 91 as intact bodies. Experts examined the skulls of eighteen crew members to determine their origin and concluded that many of them came from southern Europe.

- *The Vasa* (1628): Capsized and sank in Stockholm harbour on her maiden voyage, was raised from the seabed in 1961. Skeletal remains were recovered from at least 25 individuals, with teeth and jaws from 17 of them (Mays, 2008).
- *HMS Pandora* (1797): Wrecked in the Torres Strait in Australia; transported captured mutineers. A mix of human and animal bones in advanced states of decay was recovered in 1987.
- *HL Hunley* (1864): A submarine sank in Charleston Harbour with eight members of the crew on board. The reason for the recovery operation in 2000 was not only to determine the physical reasons for the sinking but also the recovery of the bodies.
- *RMS Titanic* (1912): The Liner entombed some 1,250 people. Some of the bodies were recovered in the following days to the sinking but most of them still lie around the wreck site. The emotional link to the wreck has made some authors (Elia, 2000) claim it as a mass grave.
- *USS Arizona* (1941): Contains the remains of over thousand sailors. Their bodies have not been recovered, and as a consequence, the site is an historic monument and a war grave, as well as a memorial.

The *USS Arizona* deserves special mention because it solves the preservation and management of human remains in a way where respect is the *motto*. The *USS Arizona*

Memorial, built over the wreck, serves as a lasting tribute to the 1,177 men who lost their lives on that "Day of Infamy" under the motto *How shall we remember them, those who died?* But it is not only an emotional answer to an attack on national identity; in 1992 more than 1.5 million visitors toured the site of the shipwreck (Slackman, 2012). Figure 4.III.1. shows the *USS Arizona* shipwreck and memorial offshore Honolulu.



Fig 4.III.1. *USS Arizona* and memorial
Source: authors' photo.

The shipwreck preserves the human remains complying with the 2001 UNESCO Convention (preservation *in situ* for the public benefit) and in addition, it receives 4500 visitors per day. To put it in another way, it is the conversion of a war grave into a tourist attraction by enhancing the respect for the deceased. And although it is unique in being in a

position to do so (low water offshore) it is a good example of preservation of a shipwreck with human remains inside.

On December 7th 1941, the Japanese launched their attack on Pearl Harbor. The result was five American battleships sunk, three destroyers wrecked and the Navy and Army aviation base badly damaged. Of the five battleships sunk, four of them were salvaged (Slackman, 2012) although only two of them returned to active service. The *Oklahoma*, the *Utah* and the *Arizona* remained as the final resting place of the men who perished in them. The *USS Arizona* was that where the most men were entombed: 1,177 died on board. However, the *USS Arizona* is still not considered underwater cultural heritage under the 2001 UNESCO Convention because it has not been under water for at least 100 years. Both a touristic attraction and an underwater cemetery, the memorial consists of a platform over one of the sunken ships. Visitors can see the vessel through the glass platform below their feet. The site preservation options have traditionally been focused on maintaining the integrity of the site as an historic monument and a war grave, rather than any direct intervention on the wreck (MacLeod, 1993). Owing to the proximity to shore-based power supplies, the *Arizona* site presents a unique opportunity but is also an example of keeping intact the physical remains of a battleship, and so preserving the human remains that are interred on the site.

This work emphasizes some of the values that the shipwreck presents as an example of management and preservation:

- (1) As a shipwreck: The *USS Arizona* was inspected in early 1942 and the US Navy determined it to be a total loss. She has created concern for its condition and possible deterioration. Surveys were carried out for the Park Service and U.S. Navy divers, although it has been undisturbed since 1962. Three-dimensional high

definition cameras to capture imagery of the interior are now used and regular services are carried out to track the oil and gas released (Slackman, 2012). The concerns are directed to both the process of saltwater corrosion and the leaking of oil at four drops per minute. As a consequence, the shipwreck remains perfectly preserved *in situ* and monitored.

(2) As a historical symbol: The shipwreck represents not only the human side but also the historical side of the tragedy: it was the trigger for the United States to enter World War II (Lenihan, 1989). But, as Lenihan (1989) asserts, the bombing was also a change of war strategy. The naval fleet lost some importance and the war became more of an aerial combat (World War II left more plane wrecks under water than shipwrecks, the former being a new object of heritage, although none are protected by the 2001 UNESCO Convention for not having been submerged more than 100 years). The central piece of the *USS Arizona* museum collection is Captain Thomas Kirkpatrick's (Chaplain Corps) clock that pinpoints the precise moment of the tragedy: the detonation of the bomb at 8.04. This object, with not only a symbolic value but also an archaeological value, gives the exact time of the detonation, so is a unique source of information.

(3) As a cemetery: Out of a crew of 1,511 only 334 survived (Slackman, 2012). But what is more important, the shipwreck is the returning place for those who were part of the disaster and survived. And many have decided to be reburied there. On April 12, 1982, the ashes of retired Navy Chief Petty Officer Stanley M. Teslow were interred, becoming the first *USS Arizona* survivor to "return" to his ship. By mid 2006, 28 surviving crew members have rejoined their shipmates in simple and private ceremonies. Following a ceremony, the urn where the deceased rest is

carried from the memorial to the dock area and presented to divers, who swim the urn into the open barbette of gun turret number four and proceed to a large open “slot” that measures approximately 6" x 5' (Lenihan, 1989). The urn is placed into this slot and slides into the ship, as illustrated on the exhibition panel on the *USS Arizona* memorial (Figure 4.III.2.)



Fig 4.III.2. *USS Arizona* exhibition panel explaining the ceremony of the urn
Source: authors' photo.

(4) As a memorial: It was decided to honour the dead and it was planned to build a memorial (Lenihan, 1989). Fundraising was through donations, most of them as a result of a television program: *This is Your Life* (titled for identification with personal tragedy) that had a surviving officer as the main guest. Elvis Presley also helped in the raising of funds with a concert, which helped to lodge the memorial more permanently in the public memory (Slackman, 2012). It was dedicated on Memorial Day, 1962, twenty years after the tragedy. On a shrine wall, there is a list of the 1,177 crewmen killed in the attack. The leaking oil (which is possible to

appreciate in Figure 4.III.3) has also reached a symbolic explanation as a hallowed place: the blood of the soldiers and the tears of the survivors (Slackman, 2012; Lenihan, 1989).



Fig 4.III.3. *USS Arizona* leaking oil
Source: authors' photo.

(5) As a tourist attraction: The site was named as the *Pearl Harbor Memorial Museum: World War II Valor in the Pacific National Monument* and included the *USS Arizona*, *USS Utah* and *USS Oklahoma* memorials and a visitor centre. The year of the opening, 1962, more than 178,000 people visited the site which attracts today more than 1.5 million visitors per year (Slackman, 2012). This combination of emotions and historical perspective on the shipwreck has been a key to the museum's success on attracting tourism. The video showed to the visitor as the final step before getting into the boat that will take him to the memorial remembers the history but most importantly, engages the visitor with the tragedy: it shapes its

memory and emotions. However, the video also leaves the visitor with a sense of reconciliation.

(6) As a stewardship: The museum is a place of trust and respect for the families of the perished crew and the survivors themselves. Families assume the shipwreck as a cemetery for their deceased relatives and they also donate the belongings of those who perished. Those families (and survivors) entrust personal items to the museum (and as a consequence, to the shipwreck) as stewardship not only for scientific and exhibition uses but also as guardians and managers of memories and emotions. Also witnesses to the tragedy, or habitants of the island, who in their time have collected remains or objects, are now donating those items to the museum.

The USS *Arizona* Preservation Project is as a model because it has application to preservation and management of historical iron and steel vessels worldwide. Using 3D printers, scientists can reproduce any object that is on the site by underwater measures, without removing or touching the object, so there is no disturbance of the site.

The United States has not ratified the 2001 Convention for several reasons (Aznar-Gómez, 2004), Bederman (1999) remarking that the main reason is considering the definition “over-inclusive”.

In conclusion, although the *USS Arizona* is not underwater cultural heritage from the point of view of the 2001 UNESCO Convention, it is a remarkable example of protection and management of shipwrecks that follows all the main guidelines of the Convention:

1. Preservation *in situ* (state of preservation monitored shipwreck)
2. Dissemination (shipwreck as an historical symbol)

3. Respect for human remains (underwater cemetery)
4. Commemoration (memorial)
5. Public awareness (tourist attraction)
6. Protection against treasure hunters and collaboration with those individuals and groups (stewardships)

III.4. Legal perspective

Protection of human remains on shipwrecks derives from communities, state and international laws built on common law (the generally understood ethics) (Hutt and Riddle, 2007: 224) and it is based in two main aspects: cultural heritage management and maritime laws.

Magnusson (1992) argues that human remains should be regarded as “personal property to enforce possession” in order to preserve them, since they have no status in law because there are no international laws or agencies dealing specifically with the treatment of human remains in archaeology (or underwater archaeology specifically). However, under common law, landowners have rights to anything which is on their land, but all common law excludes human remains from that ownership, which is called “quasi-property”²¹. For this reason, national laws can help to introduce this concept of quasi-property to international regulations since none of the international agreements on cultural heritage (except the 2001 UNESCO Convention) make direct reference to human remains but all of them can be applied to the management of human remains, as we will see.

²¹ Questions arise concerning the ownership of human remains have been largely discussed. See, for example, Magnusson (1992).

III.4.1. International agreements

III.4.1.1. 1982 UNCLOS Convention

There is no reference to human remains in the UNCLOS Convention. In this regard, Bryant (2001) argues that because the laws of finds and salvage do not prohibit the salvaging of wrecks containing human remains, nothing in UNCLOS III would prohibit salvaging vessels containing human remains. A different story is how the law of finds and salvage is applied to underwater cultural heritage, as explained in the Chapter 2 (Literature Review) of this volume.

III.4.1.2. 2001 UNESCO Convention

Article 1 – Definitions. 1. (a) “Underwater cultural heritage” means all traces of human existence having a cultural, historical or archaeological character which have been partially or totally under water, periodically or continuously, for at least 100 years such as:

- (i) sites, structures, buildings, artefacts and human remains, together with their archaeological and natural context;
- (ii) vessels, aircraft, other vehicles or any part thereof, their cargo or other contents, together with their archaeological and natural context; and
- (iii) objects of prehistoric character.

O’ Keefe and Nafziger (1994) (as has been previously discussed) suggested that the definition of "underwater cultural heritage" is designed to make it easier for administrators and courts to decide what is under the Convention. The inclusion of "sites, structures, buildings, artefacts, and human remains, together with their archaeological and natural contexts" covers all aspects of underwater cultural heritage of significance to the history of

humanity. Forrest (2002) also argues that the definition only tries to set some limits for protection under the Convention although it does not determine what underwater cultural heritage is.

However, the fact that human remains are included on the Convention means that human remains under water for at least 100 years *are* underwater cultural heritage and fall under the umbrella of the 2001 UNESCO Convention and as a consequence every article and every rule of the Convention is applicable to human remains (Dromgoole, 2013; Perez-Alvaro, 2014).

Three main concerns arise from the mention of human remains in the Convention:

(1) Multiple articles: Human remains are mentioned in two more articles besides the definition. The fact that human remains have specific articles in the Convention differentiates human remains from the rest of underwater cultural heritage. Buildings or vessels, for instance, do not have specific articles. Some authors (Aznar-Gómez, 2013) argue that it does not discriminate but it emphasizes the need for respect for human remains (Article 2.9 of the 2001 UNESCO Convention reads: *States Parties shall ensure that proper respect is given to all human remains located in maritime waters*). In this regard, Rule 5 of the Annex specifies that *activities directed at underwater cultural heritage shall avoid the unnecessary disturbance of human remains or venerated sites*). For O’Keefe (2002) human remains are specifically mentioned for their significance to the eyes of the general public. However, specifically devoting two extra articles to human remains in a Convention already protecting human remains (since they are underwater cultural heritage) sows doubts about their specific distinction and consequently, about their specific treatment. In

addition, these articles do not specify how to manage human remains if the shipwreck has to be excavated and/or raised. Neither they do specify if the remains should be reburied, should remain at the bottom of the sea or if they should be repatriated to their country of origin (Perez-Alvaro, 2014).

(2) Included in every single article: It seems clear that since human remains are underwater cultural heritage, every article of the Convention will be applicable to human remains, such as preservation for the benefit of humanity, preservation *in situ*, prohibition of commercial exploitation or international cooperation for the preservation of the remains (Perez-Alvaro, 2014).

However, these general rules conflict with ethical concerns. If human remains have:

(a) to be preserved for the benefit of humanity, it means that they are available for all and not only for the families,

(b) to remain under water as the first option, it is an idea that conflicts with its use for scientific investigation,

(c) to not be commercially exploited, it is a concept that conflicts with their use in touristic places such as museums, and

(d) to be managed under a policy of international cooperation, it ignores those shipwrecks with human remains without a nation, such as wrecks of slave ships .

(3) Since human remains are underwater cultural heritage and the Convention suggests keeping the collection together, human remains should be stored with the rest of the collection. In this regard, some authors defend that human

remains are in fact part of the whole collection, and as a consequence, they should not be separated (Manders, 2012). This would mean that if the rest of the objects of the archaeological site are recovered, the human remains should also be recovered, without consultation to living descendants. If the archaeological site is to be left untouched, then the human remains would be untouched and kept at the bottom of the sea.

The Convention does not provide more guidelines about the management of human remains because it was a politically sensitive issue when negotiating the Convention (Dromgoole, 2013). Maritime states required a special status for military graves, and other states required the same status for civil graves. However Dromgoole (2013) concludes that although it does not say it specifically, the 2001 UNESCO Convention implies that a particular site with human remains should be preserved with respect as a maritime memorial *in situ* with limited or prohibited access. The issue, as we will see, is what *respect* means.

III.4.2. Other international agreements

The following agreements, although not specific to human remains on shipwrecks, can be applied and combined:

(1) The *Vermillion Accord on Human Remains* (1989) requires the respectful treatment and consideration of indigenous communities. It asks for respect for the human remains, for the wishes of the dead, for the wishes of the local community and of relatives and for scientific research. It acknowledges the possibility of negotiation with ancestors and descendants for the uses of the remains for science and education. Since it does not

limit the scope of the Accord, and since it is intended to apply to all archaeologists, it automatically extends to human remains under water.

(2) The *Tamaki Makau-rau Accord on the Display of Human Remains and Sacred Objects* (2005), also devoted to archaeologists, establishes ethical measures on the display of human remains, such as permission by the affected community: if this permission is refused the decision should be respected; if it is granted the display should be culturally appropriate.

(3) In the *UNESCO Convention on means of prohibition and Preventing the Illicit Import* (1970) human remains are not specifically mentioned, but fall under the category of cultural property, for instance in sections *a, b, c, f* of Article 1 defining the term “cultural property”:

(a) rare collections and specimens of fauna, flora, minerals and anatomy, and objects of paleontological interest;

(b) property relating to history, including the history of science and technology and military and social history, to the life of national leaders, thinkers, scientists and artist and to events of national importance;

(c) products of archaeological excavations (including regular and clandestine) or of archaeological discoveries [...];

(f) objects of ethnological interest.

(4) The *UNESCO Convention on Intangible Heritage* (2003): if, as explained later, shipwrecks that once contained human remains which are still tangible are also seen as underwater cemeteries, since the remains are not tangible anymore they may be considered intangible heritage and as a consequence this Convention needs to be considered as a possible legal instrument and to have an annex on human remains in shipwrecks or to consider as sacred places those sites where there were they used to contain human remains.

The treatment of human remains as intangible heritage will be studied in detail below under the epigraph “dilemmas”.

(5) Some regulations on the exploitation of natural resources have already mentioned the possibility of finding human remains and archaeological sites. Specifically it is important to mention two regulations that are, however, limited to “the Area” (high seas, beyond any state jurisdiction): the *Regulations on prospecting and exploration for polymetallic sulphides in the Area*, 2010 and *Regulations on prospecting and exploration for cobalt-rich ferromanganese crusts in the Area*, 2012, read:

Regulation 37. Human remains and objects and sites of an archaeological or historical nature . The contractor shall immediately notify the Secretary-General in writing of any finding in the exploration area of any human remains of an archaeological or historical nature, or any object or site of a similar nature and its location, including the preservation and protection measures taken. The Secretary-General shall transmit such information to the Director-General of the United Nations Educational, Scientific and Cultural Organization and any other competent international organization. Following the finding of any such human remains, object or site in the exploration area, and in order to avoid disturbing such human remains, object or site, no further prospecting or exploration shall take place, within a reasonable radius, until such time as the Council decides otherwise after taking account of the views of the Director-General of the United Nations Educational, Scientific and Cultural Organization or any other competent international organization.

III.4.3. Examples of national legislations

Finding a country willing to accept the remains of the world's most wanted terrorist would have been difficult. So he was buried at sea²².

Some national laws on heritage and the protection of human remains have been created as acknowledgement of indigenous cultures (Australia) and some others have been

²² U.S. official about Osama Bin Laden. Available at: <http://www.theguardian.com/world/2011/may/02/bin-laden-body-buried-sea>

developed as a consequence to the rampant looting of archaeological sites, as in the case of Spain (Hutt and Riddle, 2007: 224). Some examples are worth highlighting:

(1) In Australia, burial at sea permits are only granted in cases of a strong connection to the sea, such as the Navy (*Sea Dumping Act*, 1981). The burial must be in water deeper than 2000 meters and not interfere with shipping, fishing or undersea communications (*Sea Dumping Act*, 1981). On the other hand, there is also an acknowledged ownership in indigenous groups of their cultural items and human remains: the *Aboriginal and Torres Strait Islander Heritage Protection Act* (1984). In addition, in a review by Australia's National Maritime Museum in July 2009 (ANMM, 2009) for the *Historic Shipwrecks Act* (1976), the museum expressed its concern because this protection act does not establish how human remains found in shipwrecks should be treated. The review, as a consequence, proposed some guidelines on how the conservation, interpretation, curation and display of human remains should be managed.

(2) In the United States Navy, the law permits human remains transported from vessels or aircraft "be buried in ocean waters under certain conditions [...]. The Federal General Permit for Burial at Sea does not apply to burials in inland waters" (United States Environmental Protection Agency).²³ Also the *Native American Graves Protection and Repatriation Act* (1990) requires consultation with tribes which can make claim for repatriation of their human remains if claimed by their lineal descendants. If there are no lineal descendants, then the recognized tribe, or if neither, the tribe that was the aboriginal occupant of the area. If none of there, they will be claimed as culturally unidentifiable.

(3) In England, the Ministry of Justice considers reburial at sea as an option (Cowan and Dunkley, 2013). In 2004 the Council for British Archaeology decided on a date of 75

²³ U.S. Environmental Protection Agency. Available at:
<http://yosemite.epa.gov/R10/ECOCOMM.NSF/oceans/burial-at-sea>

years before disturbing human remains (MacLeod, 2008). The British burial laws and the *Human Tissue Act* (2004) were thought to prevent the misuse of the recently deceased but they now form the legal framework for archaeology (Sayer, 2010). The British *Burial Act* (1857) is applicable to human remains that have been deliberately buried. Before human remains are disturbed, authorization by the Ministry of Justice is required, unless the land belongs to the Church of England which will be the one to authorize any disturbance. English Heritage signed an agreement with the Church of England (English Heritage and the Church of England, 2005) where the dignity and respect of human remains were the main concern, although it also highlighted the capacity of these human remains to release scientific information. The *Human Tissue Act* (2004) regulates the storage, use and disposal of human bodies although it is more focused on current deaths. Although the law extends to the 12 nautical mile territorial limit, it does not apply to human remains on shipwrecks since the wording of the law refers to bodies deliberately buried (Mays, 2008). The *Protection of Wrecks Act* (1973), on the other hand, protects underwater cultural heritage (not the human remains) but prohibits diving or salvage operations without a license. However, the site has to be designated to be protected.

(4) Under Scottish law all human remains have ‘the right of grave’ and to violate a burial site deliberately is a criminal act (Curtis, 2003) and can be understood to extend to maritime graves.

(5) Canada establishes “classes’ permits” depending on the importance of the site: a permit of survey for not altering or otherwise disturbing and another permit to excavate are required. It establishes different permits depending on the importance of the site, which will be established by values (Curtis, 2003).

(6) In Japan, human remains not claimed by living descendants are no longer subject to protection. This rises several issues since human remains are important, not only for the descendants but in some cases also as a symbol of a nation or a community or a hero (Iwabuchi, 2014). In addition, and as the author reminds us, according to traditional Asian beliefs, human remains will never become underwater cultural heritage. However, if human remains are seen by someone in an underwater site, it is imperative to rescue them and bury them on land. According to Pickford (1994) the Japanese, for instance, pay large sums of money for World War II losses to be recovered since their bodies have to be buried properly.

III.5. Ethical dilemmas on management

Underwater cultural heritage has a value, not only as an archaeological, economic or scientific source, but also as a keeper of human remains. It is, as a consequence, a three-concept relationship: values awarded to the shipwreck, subjects (human remains) and guardians of the deceased (cultural or genetic). Accordingly, the dilemmas in this chapter will be organized on the basis of these three ideas, as illustrated in Figure 4.III.4.

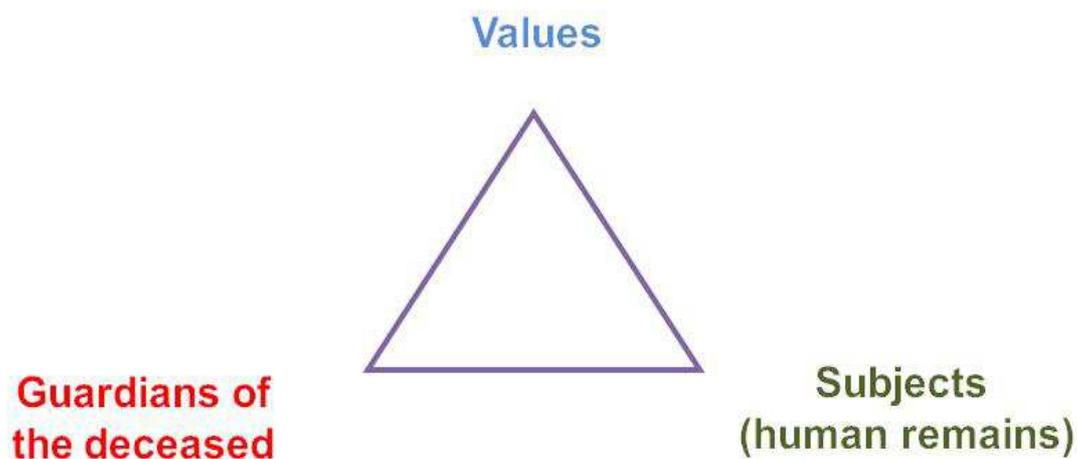


Fig 4.III.4. Triangle showing the dilemmas

III.5.1. Values

III.5.1.1. Cultural value

A major problem is that from the XIX century, the world's reality has been seen through the eyes of our own cultural beliefs and values inside a spiral of ethnocentrism (Pojman and Fieser, 2012: 12). However, what it is good in one culture may be bad in another: what is sacred for one culture may be superficial for another. And since ethics on the subject of death is an area loaded with emotions (Mays, 2008), remains of the dead can offend religious or secular sensibilities (May, 2008).

Definition of “respectful treatment” is different in different cultures. In the *UNESCO Manual for Activities directed at Underwater Cultural Heritage* (Guerin and Egger, 2011) it is highlighted that respect and significance means different things to different nations, and within a nation, to different people. Respect for the dead is acknowledged by most religions but also by people with no religion. Some cultures may need ceremonies to honour death or private access to human remains (Teague, 2007). Other cultures may choose rivers or seas as their graves for their dead (Guerin and Egger, 2011). In addition, soldiers in wars and crews of naval ships included people from many faiths and ethnicities and may be together the same site.

Wight (2009) observes that the issue of remembering (or not) tragic events depends on a number of ethical codes:

- The consideration of death, where there are usually superstitious perceptions, and a general attitude to the “respect of the dead” and their remains.
- The religious considerations with transcendental character and its impetus in life after death.

- The consideration of memories as an instrument to continue life after death.
- The consideration of the past as an example (positive or negative) for the present and for the future, associated with the collective memory of the human being. One particular aspect of this consideration is one which uses memories as a tool for the benefit of social cohesion, to create or strengthen a national, regional or local identity. The concepts of monument and hero acquire, in those contexts, an emotive capacity which can strengthen the goals and actions for the protection of the heritage (Nora, 1996-1998)
- The religious perception of the death
- The different philosophies on the consideration of the body: Christianity, for instance, is completely different from Asian philosophy and, as explained, according to the traditional Asian belief, human remains will never become underwater cultural heritage (Iwabuchi, 2014). However, as noted previously, the 2001 UNESCO Convention includes human remains under water for more than 100 years as the definition of underwater cultural heritage.

III.5.1.2. Temporal value

Respect for the deceased not only depends on traditions or cultures but also on time. What in the same culture was respectful yesterday may not be respectful today. We have to bear in mind the changing contexts of the present.

There is a dichotomy between the protection of human remains and the protection of the rest of underwater cultural heritage. Under the 2001 UNESCO Convention, as

explained, shipwrecks have to be more than 100 years old to be protected. Human remains *are* underwater cultural heritage.

However, some authors (Dunkley, 2011) suggest that before our ancestors from submerged warships which become of archaeological interest and which are able to serve science and be investigated at least four generations (100 years) should have passed. Underwater cultural heritage is better protected if older (more than 100 years after the tragedy) but human remains are better protected if more recent (less than 100 years after the tragedy). In other words, the human remains deserving respect and protection and which should be untouchable are the most recent and the shipwrecks deserving protection are those that have been submerged for more time after the tragedy. Figure 4.III.5. illustrates this idea:

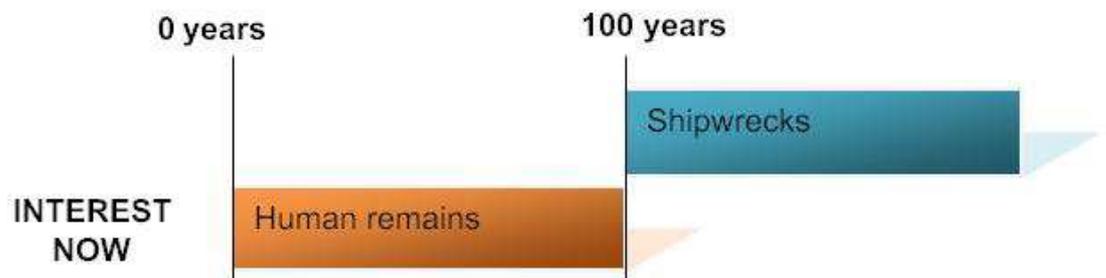


Fig 4.III.5. Chart showing the age relation

As a consequence, human remains contained in shipwrecks in the World War II should be kept undisturbed, although the ship itself can be recovered, plundered or salvaged, since it is not protected for instance under the 2001 UNESCO Convention. Following the same line of thought, a shipwreck 200 years old should be kept intact

although the human remains contained in it could be used as examples of catastrophe once four generations have passed.

II.5.1.3. Scientific value

The recovery of human remains (sometimes there are a large number of civil and/or military victims) is a source of controversy on the way that both the bodies and the shipwrecks containing them should be managed. Some opinions are opposed to the treatment of human remains while other ones are related to the need of historians and public opinion to understand the facts and through these to gain knowledge of history. The question of leaving the human remains alone, to be researched by scientists in the present or be preserved for the archaeologist of the future is not a new debate (Saunders, 2002). However, it seems commonly acknowledged that although contributions to science can carry some beneficial results, it cannot justify ignoring the dignity of the dead and their relatives (Teague, 2007). Other disciplines such as medicine have gone through the same process of thought.

One of the justifications of archaeologists and museum managers for the recovery and/or exhibition of human remains is the appeal to science and education (Curtis, 2003), which raises other ethical issues, for instance the role of museums as keepers of human remains. However, archaeologists or museum guardians are not the only stakeholders of these remains (Coroneos, 2006: 122). The establishment of respect for the dead or the development and education for the future faces complicated moral questions (Garratt-Frost, 1992). In order to establish a fair comparative analysis, this section aims to list the main/core arguments in favour of and against the use of human remains for education and/or science purposes:

Arguments in favour of the use of human remains for education and science:

1) Bryant (2001) remarks that it is widely acknowledged that gaining knowledge about the past requires examining ruins from earlier cultures, including human skeletal remains. Human remains are the source that offers us the most information about the past (Mays, 2008). In fact, human remains in shipwrecks can give us a variety of information such as demographic information, origin of the crew, specific roles of the crew (rowers, archers...), diseases and injuries (such as scurvy or bone injuries) and the diet of the crew. This information from the past is helpful in developing science in the present day, for instance, by understanding diseases better (Bryant, 2001).

2) The ambiguity of the concept of “respect” for the deceased (Curtis, 2003): it can be what archaeologists consider respect, what cultural descendants of the dead claim or what the scientific community considers respectful. In an archaeological excavation (land or marine) if human remains are expected to be found, a human osteologist is appointed, recording and tracing every step, from the location (their grave) to the point of recovery (if they are recovered) (Mays, 2008). If skeletons are found and they are recovered (for instance, for the families) they have to be handled. In addition, post-excavation in marine archaeology requires washing the bones in fresh water to remove salinity and letting them dry slowly.

3) General public opinion throws some light on the issue. According to the questionnaire from the Department of Anatomy, University College, London (Lewis and Hughes, 2009), 39% of respondents considered a dead body *to be organic waste or rubbish*; others considered it to be *an empty container* (13%); *of no significance after death* (10%); and no more than *a carcass or carrion* (9%). Although the survey sample was small, it represented a reasonable cross-section of society in terms of educational

background, economic circumstances, social position and occupation. As a consequence, this would indicate that in total, 71% of the survey's respondents expressed a disinterest in the fate of their corpses, as well as a disinterest in knowing that after their death their remains would be put to good use.

4) Some visitors expect to see human remains on display in a museum (Curtis, 2003).

5) According to Tarlow (2006) the knowledge that we obtain from dead bodies for medical research and research on human tissue cannot be obtained otherwise. Cheek and Keel (1984) argue that archaeological human remains are a source of information for both biological and cultural reasons. These authors have summarized the types of information obtained from human remains (Cheek and Keel (1984): archaeological (physical characteristics, biological and genetic elements, demographic, pathological evolutionary processes and treatment of the dead), medical (diseases and disorders) and forensic.

Arguments against the use of human remains for science and education:

1) Curators and archaeologists do not own human remains (Curtis, 2003). Ownership of human remains is controversial (Saunders, 2002). Dromgoole (2013) reminds that whether a dead body is property is subject to debate. Teague (2007) establishes a process of consultation to those interested in human remains: interview, deciding who speaks, meeting, analysis of new discoveries, recording bearing in mind when a form of study is specifically offensive to cultural traditions, restriction on the use of photographs and other records, reasonable private access to human remains for their ceremonies and allowing those ceremonies.

2) The idea of authenticity: if an authentic skeleton in a window of a museum is really informative or if it is just a source of appeal for the public. What would be the difference in showing in the window a plastic skeleton? This, as in the case of the violin of the *Titanic*, is an issue of authenticity. As this work highlighted earlier, there are different kinds of authenticity (creator, material, function, concept, history, ensemble, context, experience and style). And although a fake skeleton in a museum would not be “authentic” with regard to material, it would be on experience. Leinhardt and Crowley (2002) remark that previously objects in museums were selected for their high cultural value, were showed for being unique examples or impressive or for encouraging reactions. However, as the authors remark, present-day mentality in museums is changing. It is more interactive, including touching the objects that can only be made from copies of the real object. However, the intention and authenticity has to be cleared by the museum. In fact, in 2004 a museum in China closed for displaying fake objects (Dasgupta, 2014).

3) Deciding on which authority can order to recover the dead is a complicated issue (Tarlow, 2006).

4) How objects are displayed affects their sanctity. The same material can be sacred for different people depending on how it is presented (Curtis, 2003). A museum, especially an occidental museum, will display the object according to its criteria, which does not have to agree with the way that an indigenous community, for instance, would display it.

5) Although in medicine the use of human bodies for research is a common and accepted practice there is a difference with archaeological use which is that the bodies are obtained only through body donation and if the donor agreement is not signed, only in special and interesting cases for science, such as rare illness, the doctor will look for permission to the deceased’s relatives (Goold, 2014).

6) Finding the limit on the use of human remains is a complicated issue, since its use is increasing in medical and scientific research (Magnusson, 1992).

III.5.1.4. Funerary value

There are various and different reasons for leaving bodies undisturbed such as the spirit finding rest, the necessity to pray or show dignity, that tampering with remains is sacrilegious or reasons of tradition or culture (Scarre, 2006). For instance, some beliefs disregard mortal remains but some think that the soul is tied to the remains as long as there is a body (Cheek and Keel, 1984). In some cultures, any kind of disturbance of human remains is disrespectful (Scarre, 2006). The example of mummification or building the pyramids (Scarre, 2006) proves that for some cultures how the deceased are disposed and buried is important. In the case of shipwrecks, leaving them undisturbed as watery graves would mean leaving the human remains untouched. However, as Dromgoole (2013) points out, in a recovery of cargo from a shipwreck, even if it does not disturb the remains of the human beings, there is still a case of disturbing the sanctity of the site as a gravesite. This option has two different points of view:

1) Arguments in favour of treating shipwrecks as watery graves:

Declaring shipwrecks as funerary monuments or underwater cemeteries in most cases attract tourism if the shipwreck is accessible, such as the *USS Arizona*. It also conveys the unique meaning of sacred places, and in addition complies with the 2001 UNESCO Convention principle, for instance, preservation *in situ* (Perez-Alvaro, 2013c). However, this option will depend both on the collective interest in remembering the tragedy, and the weight of opinion to consider the shipwrecks as a sanctuary for the dead. A shipwreck represents a loss: personal or cargo. However,

the symbolic value of the shipwreck is only awarded if there is an effort to prolong its memory (Gibbs, 2005). Heritage can become an evocative symbol, acting as a trigger for emotions. Converting these burials to heritage is, as a consequence, a process and commemoration is part of this process. Says Delgado (2009):

Despite years of shipwreck exploration as a maritime archaeologist and a decade as director of a maritime museum, *Titanic* was never high on my list of lost ships to visit. I'd never considered it an archaeological site, but rather an underwater museum and memorial.

According to Howard (2003) commemoration is the alternative to conservation: we can demolish a building or leave a memorial. In terms of tourism, leaving a memorial can attract people, where they can go to remember the victims, honour them or just see it as a curiosity or a historical memory, like war memorials (Howard, 2003). States can manage and protect their underwater cultural heritage to shape public memory through the various forms of memorials and sites (Nora, 1996-1998): memorials are highly selective in terms of what they portray as worthy of being remembered. Part of our identity is based on our cultural identity. This is the feeling of a group of people or of an individual which is influenced by their culture. As Renfrew and Bahn (2008: 546) remembered, ethnicity today is a living force and heritage is an important tool in the definition of national identity. Declaring a shipwreck as a cemetery can be considered as part of this enhancement of the national identity.

2) Arguments against treating shipwrecks as watery graves:

Some authors are opposed to the treatment of shipwrecks as cemeteries (Bryant, 2001) for several reasons:

(1) It is argued that neither history nor the law treats shipwrecks, historic or otherwise, as protected underwater cemeteries, stating that the historic, social, scientific and monetary value of historic shipwrecks dictates that they should not be treated as underwater cemeteries protected from salvage or recovery. This fact is well documented. Neither history nor the law treats shipwrecks as protected underwater cemeteries. However, if as we will claim, human remains *are* underwater cultural heritage, they would be protected and managed by the 2001 UNESCO Convention, meaning that they have to be preserved *in situ*.

(2) It is also suggested (Bryant, 2001) that since underwater shipwrecks are not natural and do not belong on the bottom of the sea (they belong at their home ports and intended destinations) neither do human remains belong on the bottom of the seas. As a consequence, recovery is acceptable where circumstances permit, the reason being that while cemeteries are the intended resting places for the dead, shipwrecks are not and because shipwrecks have other diverse values, they should not be labelled as cemeteries and kept off-limits to salvors and others. Historic shipwrecks containing human remains deserve respect, although not so far as to treat them as underwater cemeteries that cannot be salvaged, Bryant (2001) concludes. However, in this regard, it is open to debate that, while cemeteries are the intended resting place for the dead, shipwrecks are not. Throughout history, cemeteries have changed their context according to the circumstances: from churches (which are not meant to be cemeteries) to main squares in the village when there are

mass deaths. Therefore, it has been the fatalities within the sunken wrecks that have converted them into submerged cemeteries.

(3) Management of shipwrecks as watery graves can lead to dark tourism, attracting tourists to a place with special meaning to the friends and relatives of the people who lost their lives in the disaster. Dark tourism is defined as a different type of tourist attraction. It is the act of travel and visitation to sites of death, disaster and the seemingly macabre (Stone, 2009). If shipwrecks as watery graves attract this tourism, tragedies would be exploited, not only to convey political messages but also for commercial gain (Sharpley, 2009). A ship is a vehicle but can also be a place of catastrophe and with a range of spiritual values with which we want to award it (Gibbs, 2005).

(4) Dr Iain Scobbie, an expert in maritime law at Glasgow University, said (Anonymous, 2003)

there are those who believe that the site is a grave, but that is normally the case only when you are talking about military ships when it is a war grave. I understand that people might be upset because their ancestors died when the ship went down, but where do you stop? Do you refrain from excavating Bronze Age ships because those who died were someone's ancestors?

(5) Finally and more importantly, it seems that declaring shipwrecks as underwater cemeteries is generally the result of a need to enhance the cultural identity of a nation, region or group, something not well accepted in some circles, since it is highly selective in terms of what is portrayed as worthy of being remembered. In this sense, the topic of heritage as a

tool to shape the collective memory has been well studied (Nora, 1996-1998; Viejo-Rose, 2011). It seems true that heritage can become an evocative national symbol, acting as a trigger for a set of emotions and historical memory. During a period of deciding what to preserve, efforts are made to shape public memory through the form of memorials, sites, references and public rituals (Viejo-Rose, 2011). As a consequence, the heritage can be manipulated by rulers to remember history in a different way. In the case of the shipwrecks, it is the idea of those who died for us, for their country. However, heritage is a process and it is only the values we award it with that will enhance its cultural identity.

III.5.2. Guardians of the deceased

III.5.2.1. Surviving relatives

For some authors, biologically and culturally related groups must have a substantial role (Teague, 2007). However, it is different to honour the ancestors and another to honour their descendants (Scarre, 2006). It is understood that the descendants are the ones having the obligation of care of the human remains (Hutt and Riddle, 2007). However, for that, there should be an “unwritten social contract” that for instance, does not exist with Tutankhamen (Scarre, 2006). In fact, Dunkley (2011) argues that the only argument to respect human remains is if there are living descendants who knew the victims. Dromgoole (2013) also suggests that if there are interested parties, their feelings have to be taken into consideration, and as a consequence, being taken into consideration for consultation. However, relatives of the dead have often been excluded from decision making (Teague, 2007).

In addition, the issue of ownership of a shipwreck also affects the human remains contained in it. A shipwreck in other nations' waters loses nationality if it is not a State vessel. Repatriation of bodies is the common practice for accidents that happen nowadays, both on land and in water. Repatriation of cultural heritage is a topic that has been largely discussed in the bibliography (Bator, 1981) but it is out of the scope of this dissertation. The only issue is if human remains arising from incidents more than 100 years underwater should or could also be repatriated.

III.5.2.2. Indigenous communities

There are communities that until recently have been excluded from their countries decisions in particular on the treatment and preservation of human remains (Teague, 2007). A prime example of this approach is the case of the Kennewick Man, a 9,300 year old skeleton found in 1996 (Chatters, 2000: 291). Five Native American tribes claimed it as an ancestor, under the *Native American Graves Protection and Repatriation Act* (1990), a law, that as previously said, allows Native Americans to remove ancestors' bones from museum collections (Bruning, 2006). However, in February 2004, the United States Court of Appeals for the Ninth Circuit ruled that a cultural link between any of the Native American tribes and the Kennewick Man was not genetically justified, allowing scientific study of the remains to continue (Bruning, 2006). The case, however, is still unresolved (Bruning, 2006).

Opposite to this approach, however, is Zimmerman's opinion (1994). For the author the collection and study of Indian remains have grown with the development of American archaeology. From the moment that the actions of the collectors were improper and offensive to Indians, archaeologists took action to become more scientifically sophisticated and more ethically aware of the indigenous communities. In this line of thought, Teague

(2007) reminds that the recent repatriation law is an approach to prohibit the scientific research in favour of traditional concerns, especially when talking of indigenous communities. In this regard, Forrest (2010) remarks that in some countries such as the US, Canada, Australia and New Zealand issues on the return of human remains to indigenous communities are of particular political importance. The author remembers that a considerable number of aboriginal remains have been already returned from these states.

III.5.3.Subjects (human remains)

III.5.3.1. War graves vs civil graves

Human remains not only have a scientific value or a cultural value, but sometimes also a political value (Gibbs, 2005). The issue is more evident in the case of war graves.

According to Williams (2005), the debate surrounding war graves has been clouded more by emotion than reason. The advances on technology for underwater explorations on the decade of 1980 was the catalyst not only for underwater archaeology, but also for the concern of disturbance to “war graves” which has always created more interest than other types of grave, maybe for being assigned to a particular group or organization. It can also be due to the feeling of *those who died for us, for their country* (Slackman, 2012).

Declaring shipwrecks as war graves is a mixture of salvage principles and legislation relating to military remains (Williams, 2005). Under international law, the captain of any ship, regardless of size or nationality has the authority to conduct an official burial service at sea. According to Aznar-Gómez (2010) sunken State vessels in non-commercial mission are grave sites and are protected by general rules protecting human remains, including *jus in bello* rules (or international humanitarian law in the law of war).

National laws are changing on this direction. In the UK, for instance, the *Imperial War Graves Commission* established in 1917 that the Commission is not responsible for unrecovered human remains and that referring to ships with those human remains as “war graves” is a mistake, since they do not constitute a “burial” as such, leaving the war remains unprotected. However, in 1986, the *Protection of Military Remains Act* (1986) was drafted. It differentiates between (1) protected places (designated by name but not locations) where diving is permitted, and (2) controlled sites, where damaging, moving or unearthing any remains is an offence. Under this Act, any excavations that contain the remains of any military aircraft or vessel of any nationality or age is forbidden.

The United States in another nation that protects war graves:

. . . salvors should not presume that sunken U.S. warships have been abandoned by the United States. Permission must be granted from the United States to salvage sunken U.S. warships, and as a matter of policy, the U.S. Government does not grant such permission with respect to ships that contain the remains of deceased servicemen

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This legal protection contrasts with the protection awarded to other kinds of watery graves. No specific legislation in any country has been established to protect the wrecks of fishing boats or the victims of accidents on oil platforms.

III.5.3.2. Changes in the “ownership” of countries

The issue of shipwrecks that were from nations that do not exist today is another issue. A good example is the Old Spanish Kingdom in South America which raised difficulties in the courtroom in the *Mercedes* case, a vessel sunk in 1804 off the coast of Gibraltar and recovered by *Odyssey Marine Exploration Inc.* (Werner, 2013). The *Mercedes* left Lima

²⁴ Letter from Department of State to Maritime Administration, December 30, 1980, *reprinted in* United States Department of State, *Digest of United States Practice in International Law* 999, 1004 (1980).

(then part of the Spanish empire but now the independent country Peru) with a crew of 337 included military men, families and civilians of that territory. A British warship destroyed the ship and killed all but fifty of the people aboard. The private company that rescued the shipwreck (Odyssey) asked for permission to salvage the shipwreck and Spain claimed that it was a sunken warship and the “graveyard of marines”. However, the dispute was not only between these two parties, as Peru and twenty-five other claimants declared their interest in the shipwreck because it originated in Peru. A number of individuals alleged they were descendants (Werner, 2013). However, their claims were promptly dismissed since it was considered that back then Peru was not a nation, but part of the Spanish Kingdom. Spain won the case and kept ownership of the shipwreck and all those on board.

III.5.3.3. The wrecks of slave ships: nationales

“The story of transatlantic slavery is a fundamental and tragic human story that must be told, retold and never forgotten” (Slavery Museum, 2013). However, the difficulty comes when some want to forget the event, rather than remember it.

Between c1500-1860, European ships transported captive Africans from Europe to the Americas on what it has been called the “middle passage”. It has been suggested that more than 11 million slaves were carried of which 9.6 million survived the middle passage (Webster, 2007). The slave trade was a driving force of the Industrial Revolution since it resulted in both colonial expansion and investments in navigational technology (Fisher, 2007). In 1806 Britain abolished the slave trade. Before that, Denmark had been the first country to abolish the slave trade and had enacted an edict to this effect in 1803 (Webster, 2008).

In order to understand the deaths on board of these shipwrecks, it is necessary to understand that ships needed to be prepared for a slave voyage, which was expensive and complex (Slavery Museum, 2013). The middle passage has been calculated at 63 days (Eltis *et al.*, 1999). The full voyage would be completed in a year.

As a consequence, a slaving venture required not only a pure slave ship. From Europe, the ships would be laden with trade goods to be exchanged for the African slaves. The ship would look like a merchant ship, except for the open gratings or the ventilation holes. They would also carry water casks, shackles and handcuffs. From Africa, through the Atlantic and the Middle Passage, the ship would be transformed to accommodate a human cargo, e.g. by building a “house” (a temporary shelter erected on the main deck for the slaves while the ship was ready to sail) and the slave decks, where the African captives would spend the voyage in crowded, unsanitary and almost airless conditions (Webster, 2008). Slaves could be men, women or children, who after being captured, were shackled together and transported in dehumanising conditions (Slavery Museum, 2013). Some of them died even before being loaded (Slavery Museum, 2013). The alterations to the ship were carried out in Africa and dismantled upon arrival in the Americas: the slave ships would be transformed to carry colonial products when they returned from the Americas to Europe (Webster, 2007). As a consequence, wreck sites are not very helpful on understanding the issue nowadays since the most important timber fittings of slave ships (*barricado*) were unlikely to survive. Figure 4.III.6. illustrates this triangular route where in each part of the journey the shipwreck would be transformed to accommodate the various cargo that was going to load, included slaves.



Fig 4.III.6. Slave trade “Triangular Route”

Source: The Abolition Project. Available at: http://abolition.e2bn.org/slavery_43.html

Despite of the importance of the subject, the number of excavated shipwrecks relating to slave shipping is undeniable small (Webster, 2008). “Nautical archaeologists have placed their collective heads in the sand and have been tossing pot-shots at opportunistic treasure hunters who have funded slave ship excavations” (McGhee, 1997: 3). Nautical archaeology has almost forgotten slave ships and the inexistent bibliography proves it (McGhee, 1997). Only a few wrecks of slave ships have been researched:

1. *The Henrietta Marie*, a London-based slaver, lost off Florida in 1700, and discovered accidentally by a commercial salvage company, Treasure Salvors Inc, in 1972. The artefacts recovered have helped to create an idea of the practices of the slave trade, since it is the most complete slave ship discovered and has been fully identified and investigated (Fisher, 2007). These artefacts include shackles and elephant ivory for trading, for instance. It was sunk in the course of the slave trade but no slaves were onboard (Fisher, 2007).

2. *The Fredensborg*. She belonged to the Danish West-India Guinea Company and sank in 1768 in southern Norway. Every life on board was saved. The imprints of shackles have been found (Webster, 2008b).

3. *The James Matthews*, a Portuguese-owned slaver, captured by the Royal Navy after the suppression of slave shipping, registered in London for trading purposes and grounded in a storm close to the coast of Western Australia. Well preserved with more than 800 artefacts recovered, although none related to its slave-trading past.

4. *The Adelaide* ran aground after leaving the slaves in Haiti. Human remains (not slaves) were found (Webster, 2008b).

5. *The Guerrero*, still not found, was in transit to Cuba with more than 500 slaves on board (Eltis et al., 1999) and of those, 41 perished on board.

Some authors (Webster, 2008b; McGhee, 1997) identify some reasons why slave wrecks have been barely investigated:

1. Archaeologists have rarely attempted to locate slaver wrecks, maybe for the perception of the subject as “difficult” and preferably avoided.

2. Historic wrecks are often discovered by professional salvage companies whose targets are “treasure ships”, not so much interested in the ship, but more in the economic valuable artefacts, rarely carried on slave ships. The discovery of *The Henrietta Marie* raises the ethical issue of the wreck of a slave ship discovered and claimed by a private company. And it opens, once more, Pandora’s Box and renews the debate of collaboration between archaeologists and private companies.

3. It is not a subject appealing to maritime archaeologists, being seen as negative history. The history of naval battles, treasure and sunken cities are more appealing (Webster, 2008b).

According to Eltis *et al.* (1999) the Transatlantic Trade Database reveals that 800 vessels transporting slaves were lost at sea, 183 whilst slaving or after embarkation. However none of the wrecks discovered were carrying slaves when sunk.

In the aspect of claiming shipwrecks containing human remains it is noticeable that the main problem is the one affecting shipwrecks in general and is the issue of mobility, which makes human remains more difficult to protect than land heritage. In fact, while on land the limits of nations' boundaries offers security and protection, ships lose their nationality rights when sunk in international waters or others' territorial waters. These lost rights affect those shipwrecks carrying people from different nationalities, as in the case of slaves' shipwrecks. International law implies that a sunken state vessel (for instance, warships and vessels on government services), regardless of location, remains the property of the state owning them at the time of their sinking, unless it explicitly and formally relinquishes its ownership (Aznar-Gómez, 2004). So a flag vessel remains that flag vessel even if its wreck lies deep in the open ocean or close to the shore of a foreign nation.

However, the picture emerging is one of a lack of agreement between states claiming rights over underwater heritage and those states that did not own the ship but whose nationals were the main occupants of the ship, as in the case of slaves. A shipwreck is never owned by those that were on board: the ship belongs to the flag state, no matter the nationality on those aboard (Aznar-Gómez, 2004). However, what is important to take into account is that the voyage into slavery was a specific (and also a shared) experience in the lives of both slaves and European crews (Webster, 2008). And as a consequence a possible

solution for their preservation that we propose is appealing to the states of the European crew' in order to research and protect both shipwrecks and slaves.

III.6. Conclusions

As we have seen, the articulation of the dilemmas surrounding the management of human remains on underwater cultural heritage has been based on three pillars: values, guardians of the deceased, and subjects (human remains). Each one of these pillars generates different ethical dilemmas. However, while the values awarded to these shipwrecks and its management depend on the historical, sociological, cultural and traditional particularities of every country (Perez-Alvaro, 2014c) and the priorities and goals of the authorities, the guardians of the deceased should be the ones in charge of taking the decisions. However, these decisions get tangled with the subjects (the human remains) that generates controversial issues such as the kind of passengers that the shipwreck carried or the ownership of the shipwreck which will produce particularities and objectives of every kind. The triangle, as a consequence, will live on.

However, these dilemmas are common to two different circumstances that can be found in relation to the conservation of human remains:

1. Shipwrecks still containing human remains: This chapter has shown that shipwrecks from almost five hundred years ago still contain tangible human remains. Not only heritage managers and archaeologists but also communities, ancestors and descendants should collaborate on what to do with them whether research, museology, reburial or leaving where they are. However, benefits from the study of human remains would come to an end if some of these human remains

are not recovered and/or studied. The real complexity arises from the choice of the remains that will be disturbed.

2. Shipwrecks not containing human remains although they once did. These shipwrecks will only be preserved by recognition of them as watery graves, even if the remains are not conserved. These shipwrecks offer a complex discourse for being respected. However, the proposal of this chapter will propose bestowing them with three different labels (intangible, absent or invisible) in order to preserve them as heritage.

As MacLeod (1993) stated, the management of the ethical, religious and social implications, and also the recovery and preservation of the human remains in aircraft and shipwrecks, will contribute to help the public be more aware of the real value of this heritage (MacLeod, 1993). Dialogue and the consideration of other actors interested on the management of human remains are the keys to the question of respect.

III.7. Proposal

The fact that human remains should not be disturbed without good reason seems to be covered by common law and generally accepted. However, we cannot protect all sites and we may not be able to protect all the human remains under water (Manders *et al.*, 2012). The examples on land show this: cemeteries are transformed by cities. For instance in Sheffield there is not a single cemetery site unaffected by modern construction and exhumation projects are common (Sayer, 2010). Shipwrecks may suffer the same fate. However if a shipwreck is evaluated and it is decided to be worth preserving because it contains human remains, a new approach has to be taken.

The scope of heritage has been admitted internationally to include tangible and intangible heritage and their surrounding environment (Ahmad, 2006). As said, two situations can arise from human remains on shipwrecks: (1) that the human remains are preserved and (2) that the human remains are not preserved but there were people who perished on board of the shipwreck.

If the human remains are still conserved they can be recovered for reburial, repatriation, museum exhibitions or for retrieving information. However, if the human remains were known to be there but they are not conserved, the option for preservation is treating the shipwreck as a watery grave. Not only can the shipwreck preserve the human remains but the treatment that we give to the human remains can preserve the shipwreck.

This study proposes three options for the treatment of those shipwrecks:

1. Intangible heritage: Graham and Howard (2008: 4) argue that intangible heritage is as powerful as tangible material, although protecting it is particularly difficult. One option explored in this chapter is if those shipwrecks that once contained human remains should maintain their status of “sacred places” as intangible heritage. According to the *UNESCO Convention for the Safeguarding of the Intangible Cultural Heritage* (2003), intangible heritage is defined as:

1. The “intangible cultural heritage” means the practices, representations, expressions, knowledge, skills – as well as the instruments, objects, artefacts and cultural spaces associated therewith – that communities, groups and, in some cases, individuals recognize as part of their cultural heritage. This intangible cultural heritage [...], provides them with a sense of identity and continuity, thus promoting respect for cultural diversity and human creativity.

2. The “intangible cultural heritage”, as defined in paragraph 1 above, is manifested inter alia in the following domains: [...] (c) social practices, rituals and festive events.

Intangible heritage does not include physical material that has been destroyed. In addition, a wreck does not constitute a ritual practice. As Lixinski (2013) argues, due to the organic evolving nature of intangible cultural heritage, legal protection may be difficult. However, Rule 5 of the Annex of the 2001 UNESCO Convention introduces the word “venerated sites” when discussing the management of human remains. For O’Keefe (2002) “venerated sites” means those ones that have spiritual attachment for certain people, being the graves of people. As a consequence, shipwrecks considered “venerated sites” would be included on the definition of intangible heritage for being “cultural spaces associated with a community”. Its preservation as intangible heritage, therefore, can be not only monuments to the great journey or heroic combat, but also a tool to shape the collective memory. Underwater cultural heritage can act as a trigger for a set of emotions and historical memory (Perez-Alvaro, 2013c) and that is considered intangible cultural heritage. In addition, watery graves fall right in the middle of the delicate issue between the definition of intangible cultural heritage (living cultural practices passed from generation to generation) and human rights.

2. Invisible heritage: A new approach to an undiscovered form of heritage has been recently raised. Ford (2013) studies the reuse of vessels as harbour structures. The author describes how vessels lose their original function (transportation) and are transformed into barracks, prisons, hospitals, store ships or hotels. Those ships, however, were never intended to be permanent structures. They ended up sailing to other ports or being sunk and destroyed. However, the ships left in these harbours remain in existence: cans, syringes, pots and all kinds of objects that can carry archaeological interest. In opposition to shipwrecks navigating and scattering the remains of life on board around the world, these semi-permanent structures left full

archaeological fields in the same spot. This is what we have called “invisible heritage”: the heritage that has been there and has left its footprints behind. In this regard, when Odyssey found the wreck of *Nuestra Senora de las Mercedes*, claimed that the shipwreck was not a shipwreck, but a field of debris, so as a consequence it was abandoned property (Zorich, 2009). This argument could have contravened with the concept of “invisible heritage”: shipwrecks fields that are known to be there but have disappeared and that have left invisible human remains. As a consequence, the human remains that were once there contained in shipwrecks that have disappeared would be considered as cemeteries of “invisible heritage”. It is the idea of the heritage as a footprint. The shipwrecks fields have as a consequence adopted the function of cemetery whose human remains were once there and need to be respected.

3. Absent heritage: it is the memorialisation of places and objects whose significance relates to their destruction or absence (Harrison, 2013). It was particularly applied by the author to the destruction of the Great and Little Buddhas of the Bamiyan Valley (Afghanistan). The pieces of heritage are the niches that once contained the Buddhas and that have remained as a memory of the destruction. This theory, applied to human remains on shipwrecks would transform the shipwrecks in “absent niches” where the human remains are not preserved but the shipwreck is preserved for its memorialisation. It is what we can consider as an “absent presence”.

These three ideas would show respect for human remains while conserving underwater cultural heritage. However, although the archaeological community would

acknowledge these concepts, for the concepts to work for the protection of human remains both on land and underwater they should be incorporated into a legal instrument.

IV. Preservation: climate change

IV. Preservation: climate change and underwater cultural heritage

In the realm of archaeology preservation in situ is usually the first option but not always the preferable or only option. Climate change challenges the norm as it affects underwater cultural heritage, as the chapter will try to demonstrate. It is time to test the “in situ preservation” option and offer new solutions. For this aim, this chapter proposes a new partnership: natural/cultural resources.

IV.1. Introduction

One of the commonly agreed principles of preservation of underwater cultural heritage named by the *2001 UNESCO Convention on the Protection of the Underwater Cultural Heritage* is the preservation *in situ* as the first option (Preamble, Article 2.5. and Rule 1 of the Annex). The reason for this being mainly because archaeological objects are better preserved under layers of mud and in saline water. The ship, once she has sunk and lies at the sea-bed, reaches a state of equilibrium with the upper parts destroyed and the buried remains covered (Green, 1990). After reaching this state of equilibrium, the wreck will be only disturbed either by human intervention or by geological changes like the ones forecast by climate change (Wachsmann, 2011).

Global warming is, as Chapman (2003) observes, an environmental and political issue. Climate change is warming the oceans and the ice at the poles is melting causing sea levels to rise. Oceans are also being overfertilized and suffering chemical changes, such as acidification or changes on the salinity. Currents also may change their pattern and as a consequence, ecosystems are becoming increasingly more endangered.

These climate changes will have a direct impact on underwater cultural heritage (Dunkley, 2013; Van der Noort, 2013). Higher global surface temperature will dry out some submerged heritage and, on the contrary, sea-level rises will flood many coastal areas, creating new underwater cultural heritage (Muckleroy, 1980). In fact, climate change will raise the sea level enough to inundate 136 sites considered by UNESCO to be cultural and historical treasures (Marzeion and Levermann, 2014). In addition, each one of the changes (warmer waters, changes in currents, rising oceans and chemical changes) will have a different effect on the various materials that constitute a submerged archaeological site.

The first part of this chapter will analyse some cases of sites affected by climate change that have already happened. Later, we will look at the concept of “climate change”. The third part studies what would happen to the shipwrecks and their cargo and materials when those changes occur. The fourth part will look at legal instruments, especially the premise of “preservation *in situ*”. This proposition raises the issue that will be analysed in part five: what is preservation *in situ* and if it is compatible with public benefit. Finally, after the conclusions and since preservation *in situ* cannot be always guaranteed but all the recovery is not feasible, as Gearey and Chapman (2006) observe, this chapter will propose a solution for the preservation of underwater cultural heritage under the threat of the climate change.

IV.2. Issue

Climate change has already caused damages to underwater cultural heritage. Sheridan and Sheridan (2013) state that civilization is heading to informed self-destruction. They define culture as “the last cab off the climate rank”. If the current global temperature is prolonged over the next two millennia, 40 of the UNESCO Cultural World Heritage sites will be

affected. Of the 720 sites listed in the cultural and mixed categories in the UNESCO World Heritage list, 136 will be impacted by rises in sea levels (Marzeion and Levermann, 2014). In addition, 3 to 12 countries will lose more than half of their current land surface (Marzeion and Levermann, 2014).

Several examples:

1. In Spain, a Phoenician shipwreck is being exposed due to the change of currents affecting the oceans. The shipwreck that was 25 years ago at a depth of 6 metres it is now only at a depth of 1.8 metres (Rubio, 2014). Its preservation *in situ* may not be the best option anymore, since it is now readily accessible to human intervention and to further changes in the currents that may damage her.
2. The raising of sea levels has disturbed the underwater graves of soldiers killed in World War II on the Marshall Islands (McGrath, 2014). The tides have exposed a cemetery containing 26 human bodies and the coffins and human remains are being washed away.
3. According to a leaked diplomatic cable²⁵, the Dalai Lama called attention to the climate changes that Tibet is suffering. Although Tibet is entirely landlocked, its temples are being inundated which will convert them to underwater cultural heritage in the future, an example that could be repeated:

The Dalai Lama argued that the political agenda should be sidelined for five to ten years and the international community should shift its focus to climate change on the Tibetan plateau. Melting glaciers, deforestation and increasingly polluted water from mining projects were problems that 'cannot wait.' The Dalai Lama criticized China's

²⁵ US embassy cables. *The guardian*. 10th August 2010 Available at: <http://www.theguardian.com/world/us-embassy-cables-documents/220120>

energy policy, alleging that dam construction in Kham and Amdo have displaced thousands of Tibetans and left temples and monasteries underwater.

4. The wreck of the *Titanic* is also suffering damage due to chemical changes and it is destined to disappear. Mann (2011) affirms:

The scientists of the *Titanic* observed that the ferrous-iron structures, such as cast iron, wrought iron and steel were corroded and covered, draped with rust-like precipitates. Ballard named them “rusticles” because they hung like icicles but looked like rust. Unfortunately, due to rusticle consumption, the *Titanic* wreck cannot be preserved forever as an underwater heritage site [...].

5. Small Island Developing States (SIDS) are vulnerable to rises in sea levels and even become uninhabitable (UNESCO, 2008). In the Pacific, for instance, the Tuvalu State is losing not only its territory due to climate change but also its identity, its heritage and as a consequence its culture as a nation (Fernández, 2013). However, the Tuvalu State is not the only State losing its territory. Kelly (2014) exemplifies how communities on the Torres Strait are suffering king tides and flooding that makes life non-viable. 7,000 people already have to adapt to climate change and the islands will be completely submerged in the future. Their territory and as a consequence their culture will be lost. In this regard, some authors warn that climate change will also modify social and cultural behaviours, with communities changing how they live and work, migrating and abandoning their heritage. Therefore, all heritage needs to be considered vulnerable to natural disasters (UNESCO, 2008).

In view of these examples, new management policies have to be planned because preservation *in situ* may not be the first or the best option anymore. It is an ultimate moral challenge and cultural heritage managers have to be prepared for policy's changes (Sheridan and Sheridan, 2013).

Preservation *in situ* has been adopted for archaeological sites (Corfield, 1996). However, the term does not have an implied definition and can raise problems with the interpretation of the term: is relocation of the site (*ex situ* preservation) also preservation *in situ*? In terrestrial archaeology, this principle has a clear answer: the decontextualization of the archaeological objects from the site is always a loss of information (Renfrew and Bahn, 2008). Furthermore, for enjoyment of the site some parts may be displayed, but if it is decided that the site has to be protected for keeping the information it may be needed to be completely covered (Manders, 2012b). In addition, preservation *in situ* is preferred to reserve the opportunity to apply future techniques and innovations (Khakzad and Van Balen, 2012). However, there will always be a future with more developed techniques. Should we always wait?

The issue has been well discussed in relation to terrestrial sites. In fact, international legislation, like *The Valetta Treaty 1992*, calls for the “conservation and maintenance of archaeological heritage, preferably *in situ*”. However, as Caple (2008) proves, archaeological remains under water are degrading and the corrosion rates of buried metal artefacts, for instance, are increasing.

The balance between protection and accessibility (funds, human resources and economic development pressures) has to be combined with urgent, unexpected needs brought by climate change.

IV.3. State of knowledge

Earth is a planet with high water content (71%). In fact it should be called Ocean, instead of Earth as the volume of water is 1370 million km³ (Rahmstorf and Richardson, 2009). Seawater is a complex mixture of chemical constituents (dissolved substances like salt,

organic compounds and gases and undissolved substance, around 70 elements), articulate matter and gas bubbles mixed with the solvent: water. The principal gases in seawater are oxygen and carbon dioxide. The solubility of oxygen and carbon dioxide decreases with increased temperature and chlorinity. Any material that comes into contact with seawater experiences some degree of solubilisation (Florian, 1987).

In addition, there is a gas exchange between the atmosphere and the oceans causing the production of toxins. This exchange has elements such as (1) carbon (land gives off more CO² than it absorbs, while the oceans takes up more CO² than it releases), (2) nitrogen (a prerequisite for life as it is a building block of proteins) and (3) sulphur (all living organisms need sulphur: a warmer and more heavily stratified ocean resulting from global warming could cause a proliferation of phytoplankton species which produce sulphurous components) (Rahmstorf and Richardson, 2009).

As climate change warms the Earth, oceans responds more slowly than land environments. But marine ecosystems have proved to be far more sensitive (Ganje *et al.*, 2011). However, is unclear which changes, if any, can occur in the oceans in the future. The most complicated picture in this regard is that scientists are working mostly under suppositions: temperature of the water, higher sea levels and changes in currents and chemical composition are difficult elements to measure. In addition, the geographical variety results in different properties of the seawater in different seas and oceans. Therefore it is difficult to determine which changes are real and which ones are speculative.

In history there have been before periods of climate change: at least two periods of global warming and intervening cold periods: 1500-1200 BC and 800-1200 AC (Cassar and Pender, 2005). Studying how people in the past adapted to climate change can hold a lesson for the future of humanity (Van de Noort, 2013).

IV.3.1. Climate change

After a review and analysis on the bibliography of climate change, this dissertation highlights the four main climate changes that will affect the oceans.

IV.3.1.1. Warming of the waters (causing chemical changes)

There have always been fluctuations in water temperatures especially in the layers of water on the surface that are in direct contact with the atmosphere (50 to 200 metres) (Rahmstorf and Richardson, 2009). In these layers the temperature has increased in the last 50 years by more than 3°C. This increase in temperature will gradually spread to deeper ocean layers, where the shipwrecks lie. This warming of the oceans could result on changes like coral bleaching and migration of different species. In addition, it is a universal principle that any chemical change happens faster in higher temperatures. As a consequence, all the deterioration that materials are subject to in seawater will take place faster.

In addition, the increasing water temperature may help the shipworms (termites of the sea or *teredo navalis*) to become adapted to lower salinity. The *teredo navalis*, according to Hoppe (2002), is a harmful marine invader that settles mostly on wooden ships and boats. As an example, a major reason for the *Vasa*'s shipwreck survival after 300 years on the seabed is the absence in the Baltic of the shipworm (Willis, 2008) because the Baltic's fresh water is a difficult area for the *teredo*. It is the fresh water and not the low salinity that helps the *teredo* to survive (Wills, 2008).

IV.3.1.2. The raising of sea levels (causing increasing pressure)

Melting land ice adds water to the sea and the increased water temperature cause oceans to expand, since warmer water occupies a larger volume than colder water. Sea levels react only very slowly and it takes many centuries or even millennia for large continental ice

masses to melt (Rahmstorf and Richardson, 2009). However, since ice masses are becoming increasingly wetter, they will melt a lot faster. Ice masses are like a “ticking time bomb”. The same authors estimate that there will be a rise in sea level of between 18 and 59 cm by the year 2100, but it could be even more than one meter. However, increases in sea levels will not stop by the year 2100 (Rahmstorf and Richardson, 2009). In this regard, it could seem that an increase of only one meter will not affect the search for shipwrecks, although it will have an effect, for instance, on the amount of time that a diver can stay under water.

However, there are other aspects to bear in mind with the raising of sea levels:

(1) more water means more depth and as a consequence shipwrecks lying on the seabed will be subject to more pressure,

(2) higher sea levels will result in legal boundaries becoming less well defined and some coastlines have already been affected and political issues and legal disputes can be expected to arise in the areas affected: islands and archipelagos would modify their territories and they may not benefit from having maritime zones. In addition, the melting of the Arctic will open new maritime commercial routes which will also bring new economic possibilities and the claiming of new territories (Fernández, 2013),

(3) some archaeological sites will flood: this means that some cultural heritage will become *underwater* cultural heritage (Murphy *et al.*, 2008), and

(4) higher sea levels also causes more powerful storms (Sivan *et al.*, 2004) that can devastate low-lying areas in the form of tropical storms and hurricanes/cyclones provoking erosion or even destroying both land and underwater cultural heritage.

IV. 3.1.3. *Ocean currents* (causing erosion)

Currents are perpetually in motion due to the gravitational pull of the Moon and the Sun since the water level is higher when the Moon is overhead (Rahmstorf and Richardson, 2009). Ocean temperatures and wind patterns also causes equilibrium of the tides. There is, in addition, a driving force in current changes called *thermohaline forcing* which is the exchange of heat and freshwater at the surface which make the water warmer or colder or saltier or fresher (Rahmstorf and Richardson, 2009). With climate change, some experts see a possible interruption of the ocean conveyor belts, largely responsible for regulating Earth's temperature (Fernández, 2013) which would modify the migratory patterns of different species.

In addition, the water cycle moves particles from the land to the ocean (Rahmstorf and Richardson, 2009). As a consequence, many materials end up as sediment at the ocean floor. These changes would affect the submerged heritage in different ways:

- (1) part of the present preservation of underwater cultural heritage in the oceans is due to a protective layer of sediment, mostly formed by microorganisms. Alterations to its pattern could damage the protective layer on the archaeological materials,
- (2) all the materials will be affected by waves and currents not only because of their erosion but also because movements of water, and
- (3) a change in currents can mean a displacement of all, or part, of the submerged archaeological site, decontextualizing it from its original location or separating the objects from the main site.

IV.3.1.4. Chemical changes (causing deterioration and disintegration)

Different chemical changes can occur in the oceans due to climate change. However, changes in acidification and salinity could cause greater damage to the submerged heritage (Dunkley, 2013).

a) Acidification

Two concepts are fundamental to the understanding of the process of acidification: oxygen and pH. Oxygen is lost in seawater mainly by exchange with the atmosphere and by utilization in aerobic respiration of plants and animals and decomposition of organic material. The CO₂ controls the alkalinity of the seawater and the deposition of marine sediments. Also, because of the burning of fossil fuels, the chemical composition of seawater is altered, so it becomes more acidic (Rahmstorf and Richardson, 2009). More acidification means more corrosion in metals although it depends on the composition of the metal. Oxygen-rich seawater is strongly oxidizing whereas seawater depleted in oxygen is a reducing factor. Oxygen always acts as an accelerator of metal corrosion (Florian, 1987b).

The second concept is pH, a measure of the acidity on liquids. The solutions with less than pH 7 are acid and the solutions with more than pH 7 are alkaline. Normal water has a pH of 7. Seawater has a pH of around 8 (between 7.1-8.3). Acid rain has 5.6. (IPCC *Fourth Assessment Report: Climate Change* 2007). If historically sea water has an average value of 8.0 it has dropped to 7.9 in the past century. Due to increasing levels of atmosphere CO₂ a drop to 7.4 in polar and sub-polar water is predicted (Daly, 2011). If in seawater the pH decreases because of climate change, it will result in its acidification, and as a consequence, the damage to material under water will be higher. This is also due to

global warming, since with more temperature the pH decreases and the acidity rises (Daly, 2011). However, pH also changes due to salinity, pressure, CO₂ concentration and marine organisms. In addition, corrosion increases in water with a low pH.

b) Salinity

In open sea salinities are around 32-33‰. Higher salinities occur in enclosed seas subject to high evaporation (Mediterranean 38.6‰ and Red Sea 41‰) (Florian, 1987). However, scientists still do not know if salinity will decrease or increase from the melting of polar ice. Evaporation due to global warming increases salinity while the addition of freshwater decreases salinity. One of the elements of the ocean environment that will suffer most from climate change will be the coral reefs (Daly, 2011). The coral reefs of today have been established over thousands of years. Because of salinity coral reefs will bleach (Rahmstorf and Richardson, 2009). It is also questionable if the coral will be able to keep up with the expected increase in sea levels later this century: by 2065 there will be no regions in the world's oceans where the chemical conditions will be sufficient to support the formation of calcium carbonate by corals (Daly, 2011). Corals produce aragonite and are, thus, predicted to be particularly sensitive to higher levels of ocean acidification. However corals are the habitat of many fish species and it is essential to preserve them. Some authors (Daly, 2011) compare the changes suffered in the survival of coral reefs with changes that will affect underwater cultural heritage because some shipwrecks are artificial reefs and the habitat of different fish species. In addition, salinity is a corrosion "accelerator", which increases with depth where more shipwrecks that act as artificial reefs lay.

IV.3.2. Preservation of material under current ocean conditions

Climate change can affect the underwater cultural heritage in two forms:

- a) Additional submerged places will be created and, on the contrary, previously submerged places will become exposed.

A total of fifteen of the world's twenty megacities are situated by the sea. "If water levels rise even further, by 3, 4 or 5 metres in centuries to come, we will have to give up some of the cities" (Rahmstorf and Richardson, 2009). These underwater cities will be in the future underwater cultural heritage. However, this trend is difficult to predict and it will not have an effect on the tendency to preserve *in situ*. This chapter, as a consequence, will be focused on the second consequence of climate change on the submerged heritage:

- b) The current underwater cultural heritage will be affected, damaged or moved.

Variations in seawater follow universal chemical, physical and biological laws. The shipwreck, in contact with water, experiences equilibrium (Florian, 1987). At 400-800 metres depth archaeological sites experience low and near constant water temperatures all year-round (Daly, 2011). Sunlight, a biodeterioration accelerator, does not penetrate below 200m. At the seafloor the current speeds are often very low with minimal tidal effects and sediment transfer rates are also low. As a consequence, cold temperatures and currents in the deep-water environment have a strong preserving effect. Only when objects are disturbed is the equilibrium they acquired during burial and the stability lost (Piechota and Giangrande, 2008).

Erosion by currents, tidal movements or changes in water circulation, resulting in objects being removed and displaced is a real threat as well as erosion by dredging, fishing and anchoring (Manders, 2012). Sediment accretion will be also having consequences (Chapman, 2003): archaeological deposits could be buried by accreting silts. As a consequence, the discovering of the new sites would be more difficult.

Figure 4.IV.1. presents a general picture of the current main maritime trade routes (and also road networks on land). The main body of shipping lanes is concentrated in both the Atlantic Ocean between Europe and North America and the Pacific, between North America and Asia.



Fig 4.IV.1. Maritime and land routes today. Source: Joan Carballo.
Available at: <http://blog.engeneral.net/search/mapa%20rutas%20maritimas>

It is instructive to compare this image with Figure 4.IV.2, which plots many of the sunken vessels in the seas and oceans around the world. The areas with the most yellow points match the above main maritime trade routes through the Atlantic Ocean (where also most maritime battles took place). The Atlantic and Pacific Oceans are also known for the danger of storms, poor navigation and accidents.



Fig 4.IV.2. Sunken vessels around the world. Source: Guillermo Carvajal.
Available at: <http://www.lasegundaguerra.com/viewtopic.php?f=146&t=2171>

These two maps can be compared with a third one showing thermohaline circulation. The most populated shipwreck areas showed in Figure 4.IV.2. are the ones where most surface and deep currents occur (as it is possible to appreciate in Figure 4.IV.3.), besides being areas more affected by salinity. This means that where there are more shipwrecks lying at the bottom of the oceans there will also be more changes to the currents, both on the surface and the bottom, exposing some of the shipwrecks and eroding some others (Dunkley, 2013b). This proves that the sites where there is more underwater cultural heritage will suffer due to the changes of currents i.e. in the Atlantic Ocean. In addition, the changes to the currents in the Southern Ocean will affect the rest of the oceans, as Rahmstorf and Richardson (2009) emphasize.

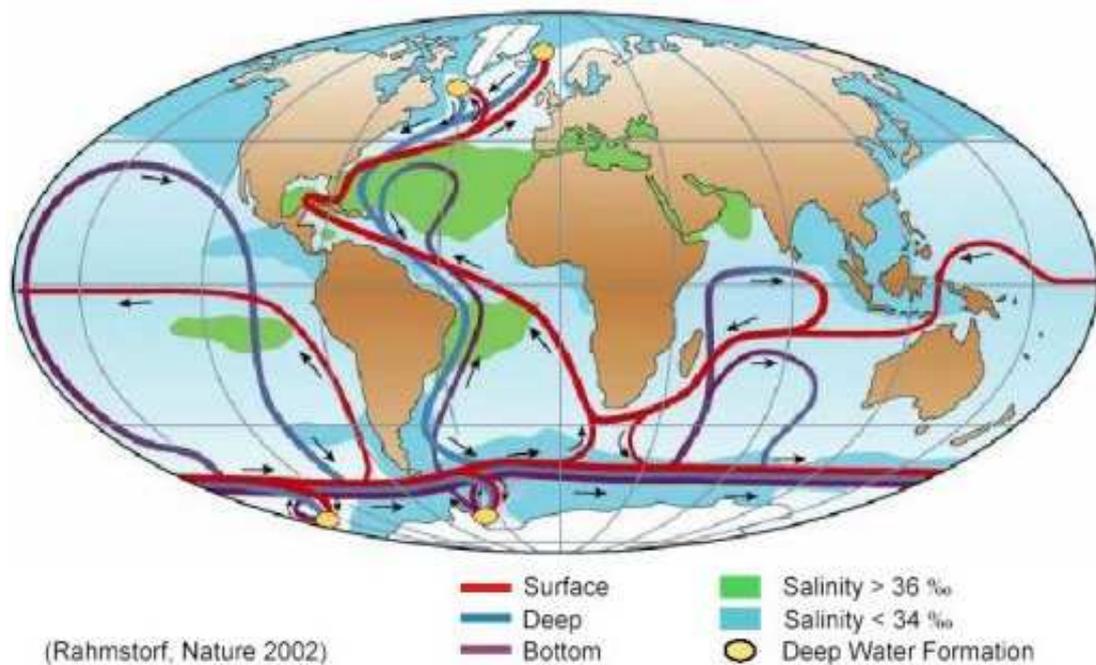


Fig 4.IV.3. The thermohaline circulation of the world's oceans. Source: Potsdam Institute for Climate impact Research.
 Available at: http://www.pik-potsdam.de/~stefan/the_fact_sheet.html

IV.3.3. Materials

As previously explained, the most important source of information for the archaeologists of an underwater site is not only the ship or underwater cities but also her associated objects: context, inventory, personal belongings and cargo (Manders, 2012), each one of them having a different reaction to water and changes.

Shipwrecks can become trapped on rocks or be washed ashore, although the most common scenario is that they sink beneath the waves (Willis, 2008). After, they may be broken by currents, crushed by water pressure or covered by corals, mud, microorganisms and sand. Some wrecks have reached the sea bottom in a more or less intact condition, since the natural buoyancy of a wooden hull does not immediately sink, but slowly floats until reaching the bottom (Wachsmann, 2011). Anchors, for instance, might end up beneath the ship since they would hang below the ship during the descent. However, as said, after

being stabilized, there is little physical disturbance by post-depositional forces (Piechota and Ciangrande, 2008). However, how well a shipwreck is preserved depends on various factors such as weather, temperature, salinity, pH, or depth where is located. It is not the same with the conservation of material from freshwater that from marine sites (Hamilton, 2000). Encrustation is one of the main problems in all materials: the degree and extent of the encrustation depends on the local sea environment. It does not form in fresh water and it is extensive in tropical sea water. As a consequence, in cold water, the encrustation is minimal (Hamilton, 1997). Also there are other relevant environmental attributes (Muckelroy, 1978): how close is the wreck to the coast, the average slope of the sea-bed, the sedimentary deposits, the size of the tidal streams and the nature of the sea-bed, which may be really diverse: sandy shores, rock shores and shores with submerged cliffs.

As said, the ideal condition for preservation is with no daylight, in deep water and where the temperature is cold and marine animals cannot live (Willis, 2008). In addition, they are free from human interference and treasure hunters. In normal conditions, the preservation of the hull will be limited to those portions buried in the anoxic sediment soon after the sinking (Wachsmann, 2011). If there is any part of the organic cargoes or shipwrecks that are not covered by sediments, they will disintegrate. There have also been cases of survival of the shipwreck in shallow and warm water if it is buried on mud (materials like human or plant remains and even clothes). In adverse environmental conditions, stone, gold, silver, mercury or platinum have appeared to be almost unaffected (Willis, 2008). This is not only because of its chemistry but also because heavy objects will obviously tend to drop faster through layers of deposit remains. Elements like alkalinity, hardness, and pH of the water act to determine whether the water will produce scale or corrosion on that material or will be stable. In this regard, aluminium has the highest rate of corrosion under any pH. However, as we will see, aluminium (for its characteristics) will

be mainly used in aircraft, not in shipwrecks. On the contrary, copper which has a good resistance to corrosion in seawater will be frequently found in shipwrecks.

Humans have been travelling at sea for at least 60,000 years (Willis, 2008). Naval engineering has continuously improved in a way that ships are built with strong materials, resistant to water and marine organisms and that do not corrode in salt water (which becomes an electrolyte solution). From the first ships (logs together to form a raft around 10,000 BC) to the ships today (war, carriers, luxury, research ships) many different materials have been used to build them (Macdonald, 2008: 8). According to Smith and Couper (2003) from the 1850s there was an emphasis on durable iron rather than perishable wood. And in the 1880s iron was replaced by steel. Both iron and steel ships are much better preserved, for instance the *Titanic* or the craft from the two World Wars (Ships Visual Encyclopaedia, 2010).

However, of all materials, iron and wood are the ones that cause more problems in its preservation. Usually these materials form a layer of encrustation. The natural moulds formed by corroded metal artefacts are also present in wooden objects containing metal, for instance, nails (Delgado, 1998). If this concretion is cracked or damaged, CO² ingress can cause irreparable damages (Green, 1990).

Artefacts recovered from a salt water environment are often well preserved but of a very fragile nature (Hamilton, 1997). In addition, it is necessary to distinguish between permanent damage (like a destroyed artefact) or damage that can be fixed by the conservator (like a layer of sediments) when talking on protection and conservation of underwater archaeological remains. However, all the material, if recovered, must be quickly conserved because they will easily deteriorate when they leave their stable environment. In the same way, this will make a difference to the material when affected by

climate change, since they are of a very fragile nature and any change that makes them leave their undisturbed environment will deteriorate them.

IV.3.3.1. Waterlogged wood

Wood is a major component of ships and was used for hulls, decks, masts and personal items such as combs, bowls, tables or furniture. *Waterlogged* means the complete filling with water of the pore spaces. This fully saturated wood that is removed from under the sea and exposed to the air may be rapidly deteriorate since the excess water evaporates and the surface tension of the evaporating water will cause the weakened cell walls to collapse (Grattan, 1987; Hamilton, 2000). However, wood from marine wrecks tend to be very impermeable. Being of organic origin, wood normally decays under combined biological and chemical attack when buried in the ground but it can survive prolonged exposure to extremes of dryness or wetness (Hamilton, 1997). In shipwreck sites underwater the wooden components of the hull and small artefacts of wood often survive in good condition. Damage to submerged wood can range from as a result of wave action to alterations of the ultrastructural level (Grattan, 1987). Also there can be damage by biodegradation, like the attack by marine borers and crustaceans, ligniferous marine fungi or by marine bacteria. Marine worms mine the original wood of the shipwrecks leaving organic-rich sediments behind. However, the damage will depend on the chemistry of the environment of the wreck, of the duration of the burial and mostly of the presence of iron. On the seabed floor the environment that forms the perimeter of a wooden shipwreck tends to be very different from the surrounding seabed. The large mass of decaying wood left by the hull alters the chemistry of the sediment profoundly (Piechota and Giangrande, 2008).

Changes that may have an effect: the raising of sea levels does not seem to be the major threat to wooden remains. However, because of current changes, the erosion of

protective sediments on wood exposes it to oxygenated water and exacerbates existing bacterial action (Daly, 2011). Acidity can also cause serious problems. Another of the main problems will be salinity, since shipworms (which can deteriorate the shipwreck within a few months (Manders, 2012)) require high salinity: the increase in global warming may help the shipworm to survive destroying the wooden remains of shipwrecks or artefacts (Manders, 2012).

IV.3.3.2. Organic material other than wood

There is not too much published research on organic material surviving marine burial although it was a material widely used: cordages, rope, textiles, leather, basketry or rubber shoes (Florian, 1987). In the process of sinking, these materials have been waterlogged, swollen, covered with sediments, heavily encrusted with calcium concretion and impregnated with iron oxide, tar or calcium salts.

1. CELLULOSIC MATERIAL: such as fibres or leaves. According to Florian (1987) this is a naturally watery material but much of the natural water within the material is lost during fabrication and usage. This material may have been preserved because of the restriction of swelling due to the presence of sodium chloride (table salt) in seawater (Florian, 1987).

Changes that may have an effect: only changes in ocean currents would affect the cellulosic material by spreading it or stretching it.

2. PLANT PRODUCTS: such as resin or rubber. Micro-organisms may be important in the very slow degradation of these elements (Florian, 1987).

Changes that may have an effect: only by micro-organisms, maybe generated by the warming of the oceans.

3. ANIMAL ORIGIN: such as skin, hair or feathers. Each one of these elements has a specific structural organization. However, in general, if extreme swelling and stretching occurs, the inner more vulnerable layers and cells are exposed and degradation may start. Bacteria and fungi can attack these materials (Florian, 1987).

Changes that may have an effect: chemical reactions would cause depolymerization of the molecules and disintegration (Florian, 1987). Change in ocean currents or rises in sea levels do not seem to be factors that would deteriorate the materials. However, direct growth of micro-organisms due to warmer water could destabilize them.

4. TEXTILES: All textiles are deteriorated by light, insects, microorganisms and air pollution. Also the oxygen in the atmosphere affects all organic substances to varying degrees (Hamilton, 1997) by being able to cause disintegration. The speed of the deterioration varies according to the nature of the fibres and existing local conditions. The main factors that promote disintegration can be organic (subject to attack by moulds and living bacteria), physical (like exposure to ultra-violet light or excessive heat) and chemical (exposure to noxious gases) (Hamilton, 1997).

Changes that may have an effect: the level of the sea would affect it because it could expose it to ultra-violet light. Fibres, cotton, wool and silk can only live in alkaline conditions. If there is an acidification, these textiles disappear. Warming of the oceans would affect the growth of moulds and living bacteria. Chemical changes could cause disintegration.

5. TEETH AND IVORY: are easily preserved and the most mineralized (Florian, 1987). Heat affects ivory which can even be fossilized because of the salt (Hamilton, 1997).

Changes that may have an effect: acid may disintegrate them as well as warming the oceans. No other factors seem to complicate their preservation.

6. BONE: acid and inorganic salts are what would affect it most (Florian, 1987). Bone is warped by heat and moisture and decomposed by prolonged exposure to water. It can even be reduced to a sponge-like material or fossilized because of the salt (Hamilton, 1997). Satisfactory restoration is often impossible. Bones are decomposed by hydrolysis and inorganic structures are disintegrated by acids. They also become easily stained.

Changes that may have an effect: chemical changes would affect its preservation, as well as changes in the temperature of the water. Because of these reasons, bone would disintegrate more easily.

7. LEATHER: there are many processes involved in its fabrication and its preservation depends on them (Florian, 1987). It experiences complex changes in a marine environment.

Changes that may have an effect: leather only seems affected by chemical changes and water temperatures. Other changes should not affect it.

IV.3.3.3. Metals

Metal shipwrecks are in danger. A 10 mm thick hull can be perforated or even totally corroded within 100 years (Memet, 2008). Less oxygen means less corrosion (Manders, 2012). From the moment of manufacture, the various metals and their alloys, except for gold, react with their environment and begin a corrosion process (Hamilton, 1997). Corrosion of metal artefacts is different but often has interrelated factors depending on metal composition, water composition, temperature, marine growth, seabed composition, position of objects, depth of burial beneath the seabed and extent of water movement (North and MacLeod, 1987). In sea water, temperature, pH and the presence of aggressive

anions, such as chloride in the water, determine the rates and types of corrosion (Hamilton, 1997). Warmer water produces a protective concretion on the metal surface, except in the case of the copper (North and MacLeod, 1987). When a piece of metal is placed in seawater, a large number of oxidation and reduction reactions can occur on the metal's surface. Metal also shows accelerated deterioration at the mud line due to oxygen gradients. The oxidizing stage lasts from 1000 to 100,000 years and may extend to depths from one to 100 metres. It is in this depth and time range of sediment that wreck sites usually occur (Florian, 1987). Metals are commonly encrusted with thick layers of material such as conglomerations, from a single coin to masses weighing several thousand pounds. Also, in those conglomerations it is usual to find other artefacts, like ceramics, glass, wood, leather or bone (Hamilton, 2000).

1. IRON: Iron presents a difficult problem because once exposed to air on the surface, the corrosion rate will accelerate (Green, 1990). Metal shipwrecks may deteriorate more quickly than wooden vessels given the same conditions. Iron tends to create massive concretions since iron is not a biologically toxic material and immersed in seawater is rapidly colonized by marine organisms (North and MacLeod, 1987). Iron corrodes five times faster in sea water than in soil and ten times faster in sea water than in air (Hamilton, 1997).

Changes that may have an effect: as we have said, high temperature has an effect on biological growth. Corrosion expects to be double for every 10°C increasing in temperature (North and MacLeod, 1987). Movements of water across the wreck site can affect corrosion rates through metal erosion, destruction of protective films or changing the amount of oxygen. Also metal corrosion rates increase with increasingly salinity. The growth of marine organisms can produce a protective barrier between the artefact and the

seawater, although this can also transfer chemical species creating a microenvironment. As the level of salt increases, water becomes more corrosive (Hamilton, 1997).

2. COPPER: Copper is one of the most common material on ships. It is toxic to marine organisms, so it reduces the growth of such organisms. As a consequence, copper is found unconcreted. For this reason, covering wood by copper was a way to protect wooden vessels from attack by the *teredo* worm and from fouling by marine organisms (North and MacLeod, 1987). Therefore, copper objects are usually partially covered by wood fragments. Beneath the wood the oxygen supply is depleted and causes increased corrosion.

Changes that may have an effect: as sated warmer water makes copper corrode approximately twice as fast for every 10°C of temperature rise (North and MacLeod, 1987). However, it is a noble metal that survives adverse conditions (Hamilton, 1997). Pressure may also affect the corrosion mechanisms and water movement increases the effect of a corrosion attack.

3. BRASS AND BRONZE: These materials can be found, for instance, in most cannon balls. At a normal pH most corrosion of these elements would not affect them (North and MacLeod, 1987).

Changes that may have an effect: only the warming of the seawater temperature and changes of pH would deteriorate this material.

4. PEWTER, LEAD AND TIN: On those materials, and even after nearly 350 years in turbulent condition, the depth of corrosion can be less than 1mm (North and MacLeod, 1987). However, high temperatures might affect its preservation. Pure tin items are seldom encountered in archaeological sites: it is found more often used in various alloys. Lead is

commonly found as it was used for weights, cannon balls, sheeting and striping. It is a stable metal in neutral or alkaline solution. It usually forms a protective layer that prevents oxidation. Lead free pewter suffers extensive corrosive attack in aerobic seawater (Hamilton, 1997).

Changes that may have an effect: high temperatures in the seawater and change in pH would cause corrosion to these materials.

5. SILVER: Most of the silver artefacts found are coins, and consequently the majority of silver corrosion and concretion information is derived from coins (Hamilton, 2000). It is one of the finest metals, but chloride and sulphite ions found in marine environments increase the reactivity of the metal. The metal does not appear to be as toxic as copper to many marine organisms. However, the cold makes coins susceptible to stress corrosion and cracking. Also the reduction of oxygen increases corrosion rates (North and MacLeod, 1987). However, it is not attacked by dry air (Hamilton, 1997).

Changes that may have an effect: silver is completely stable in aqueous solutions of any pH, so acidification will not affect it. Only changes in salinification could cause changes to the material.

6. GOLD: It is corrosion resistant. Only if it is in combination with other alloys can the gold surface weaken. In general, the combination of two materials (metal and ceramic, for instance) is dangerous as factors not damaging on one material can affect greatly the other material (Hamilton, 1997). As a consequence, any changes in a material that contains gold, can also damage the gold.

Changes that may have an effect: gold, as silver, is a really stable metal. It would not suffer from any of the climate change if not combined with other materials.

7. ALUMINIUM: It is stable at room temperature and is usually immune to general corrosion attack in the pH range of seawater (North and MacLeod, 1987). Few shipwrecks have aluminium unless the vessel was lost later than 1920s but due to its light weight it was used in the aircraft industry, especially from the World War II.

Changes that may have an effect: water temperature and sea level change would mostly affect aluminium.

IV.3.3.4. Others

Ceramics, glass and stone objects don't deteriorate rapidly from submersion in seawater. The most significant problem is physical damage. A further problem is the accumulation of marine deposits (Pearson, 1987).

1 CERAMICS: Low-fired pottery is the most common, and is large in number and dimensions. Objects made from clay not fired will readily dissolve and will not be preserved. However, earthenware survives well in marine environments. Ceramics are invariably covered with organic concretion resulting from marine organisms. Breakage is common from water and sand or sediment movement (Pearson, 1987). It is advisable to reduce the salinity of the water slowly (Green, 1990) but it will not have affected the pieces deeply since they do not absorb soluble salts as they are impervious to liquids (Hamilton, 1997).

Changes that may have an effect: change on temperature does not seem affect ceramics. However rises in sea levels and change in currents would affect them as they are mechanical elements that could cause breakage. Chemical changes will not have a great effect.

2. GLASS: Glass fragments buried in the surface show greater deterioration than suspended or deeply buried glass (Florian, 1987). Ion leaching will cause the glass to become opaque. The deterioration is increased with increases in pressure, temperature and time of exposure. Also the pH of the surrounding environment will affect deterioration. However, this is usually damage that can be repaired by the conservator. Glass can survive reasonably well underwater apart from breakage (Pearson, 1987).

Changes that may have an effect: all changes except salinity would affect glass. However, there is no risk of disintegration but of damage, like leaching.

3. STONE: The deterioration of stone is associated with its properties: porosity, water absorption, hardness, strength, thermal expansion and composition. Chemical deterioration depends on the mineral composition and it can be susceptible to dissolution. It will be influenced by salinity.

Changes that may have an effect: it is susceptible to erosion by water and sediment movement. Also to some chemical changes.

Table 4.IV.1. summarises the effects of climate change on underwater cultural heritage materials. As we can observe, of the 18 elements that we can find in a shipwreck, 12 of them would be affected by the warming of the waters, 6 by the rises in sea levels, 7 by the change of ocean currents , 7 by changes in salinity and 12 by changes in acidification. Rises in sea levels, would be, as a consequence the less aggressive change that underwater cultural heritage faces. However, it would cause irreparable damage to ceramics and glass, an important source of information for archaeologists (Renfrew and Bahn, 2008).

MATERIALS	MAIN PROBLEMS	WARMING OF THE WATERS	RISES IN SEA LEVELS (more pressure)	OCEAN CURRENTS (erosion)	CHEMICAL CHANGES	
					salinity (higher)	acidity (less pH)
1. WATERLOGGED WOOD						
1. WOOD	Waterlogged and evaporation	✓		✓		✓
2. ORGANIC MATERIAL NO WOOD						
2.1. CELLULOSIC MATERIAL	Stretching			✓		
2.2. PLANT PRODUCTS	Micro-organisms	✓				
2.3. ANIMAL ORIGIN	Swelling and stretching	✓			✓	✓
2.4. TEXTILES	Light, insects, pollution, microorganisms	✓	✓		✓	✓
2.5. TEETH AND IVORY	Heat and salt	✓			✓	✓
2.6. BONE	Warped by heat and decomposed by water	✓			✓	✓
2.7 LEATHER	Complex changes	✓			✓	✓
3. METALS						
3.1. IRON	Massive concretions. Organisms			✓	✓	✓
3.2. COPPER	Unconcreted. Heat.	✓	✓	✓		✓
3.3. BRASS AND BRONZE	Need of normal pH	✓				✓
3.4. PEWTER, LEAD AND TIN	Alloys are the main problem	✓				✓
3.5. SILVER	Stable				✓	
3.6. GOLD	Stable					
3.7. ALUMINIUM	Unstable to heat	✓	✓			
4. OTHERS						
4.1. CERAMICS	Breakage		✓	✓		
4.2. GLASS	Breakage	✓	✓	✓		✓
4.3. STONE	Chemical changes can cause dissolution		✓	✓		✓

Table 4.IV.1. Climate change effects on underwater cultural heritage material

The only element that would not suffer with the effects of climate change is pure gold. Paradoxically this is the element that is most sought by treasure hunters so its preservation is not either way guaranteed. Textiles, copper and glass would be the most fragile elements in the event of future changes. However, for most materials, only by being affected by only one change could make them disappear, as in the case of iron that would suffer massive concretions from chemical changes.

For the reader's convenience, Figure 4.IV.4. summarizes the amount of materials that would be affected by the different climate changes:

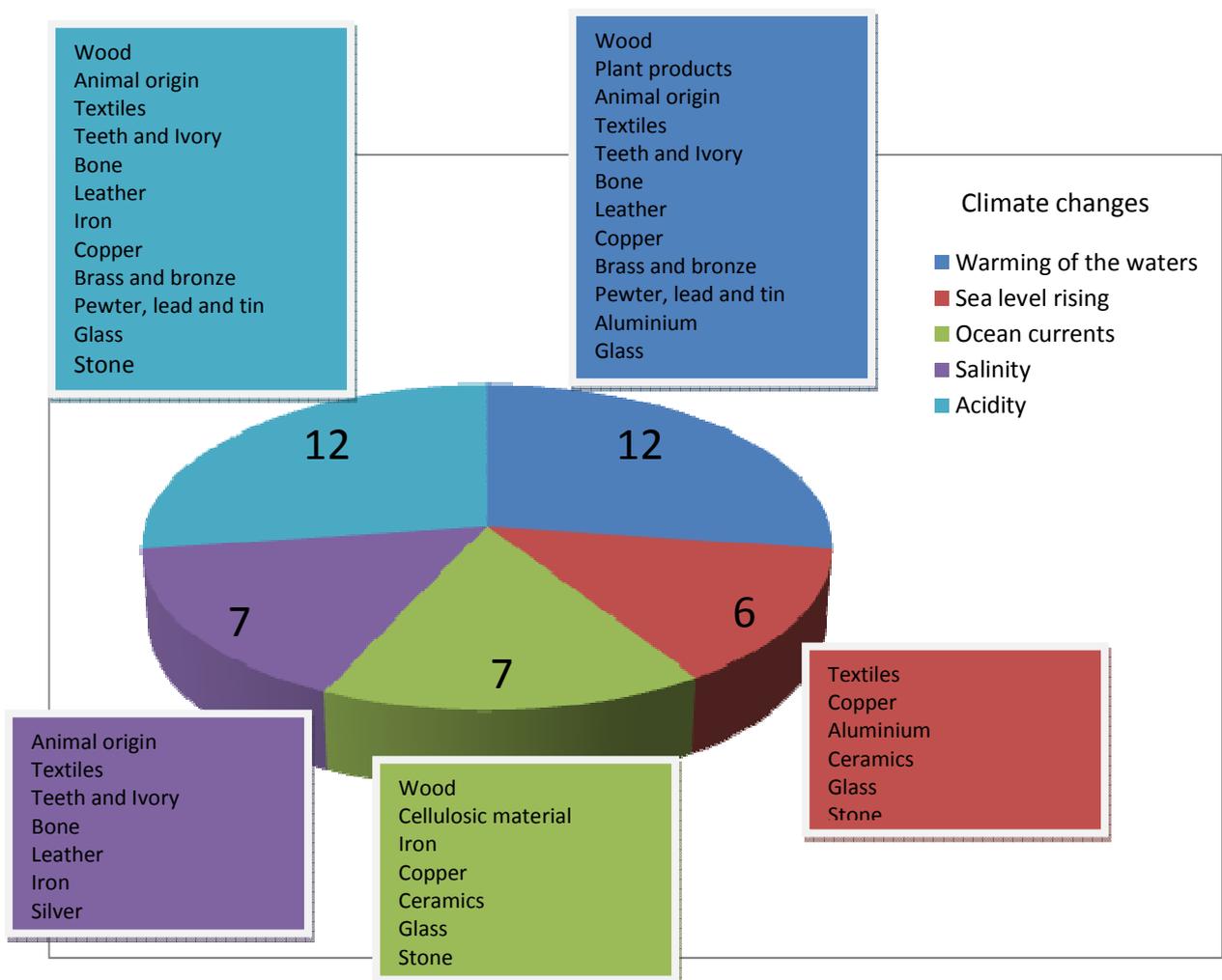


Fig 4.IV.4. The effects of climate change on submerged archaeological material

Of all the materials, the most significant in underwater cultural heritage are: (1) the wood of ancient shipwrecks, (2) the bones of human remains and (3) the metals in most modern wrecks (Manders, 2012b). Priority should be giving to those materials attracting the most attention in terms of preservation and protection.

IV.4. Legal perspective

Legislation can be used to minimize human threats (Manders, 2012) to underwater cultural heritage. There is only 1.9 million km² of ocean area where nature conservation regulations apply (Rahmstorf and Richardson, 2009). There is some Marine Protected Areas (MPA) but some authors (Rahmstorf and Richardson, 2009) believe that at least 20 to 30% of the world's oceans should be protected.

Human interactions with the oceans are extensive and becoming more so every day. These different forms of interaction with the oceans can easily come into conflict with one another (Rahmstorf and Richardson, 2009). Around 95% of intercontinental cargo transport is carried out on ships. The North Sea alone is crossed by 200,000 ships a year (Rahmstorf and Richardson, 2009). There are 540 oil platforms in the North Sea where a blowout can easily happen during exploration or drilling. However, only 20% of debris comes from ships and offshore platforms. The rest comes from land based sources.

The Intergovernmental Panel on Climate Change (IPCC, 2007), Group I concludes that the oceans are warming and the salinification of water is changing. Although they are not visible ocean circulation changes, the ocean biogeochemistry is changing since there is evidence of decreased oxygen concentrations. And the sea level is definitely rising. In 2014 the Panel will issue a new report (IPCC webpage).

Despite of all this information, international instruments fails to protect cultural heritage from climate change forces (Sheridan and Sheridan, 2013). There are gaps in the capacity of the legislation for future protection. Only the *Convention Concerning the Protection of the Worlds Cultural and Natural Heritage* (1972) has some response to climate change (Sheridan and Sheridan, 2013). The *2001 UNESCO Convention on the Protection of the Underwater Cultural Heritage* does not mention climate change as an adverse factor for underwater cultural heritage. However, Dromgoole (2013) feels that the term in the definition “partially or totally underwater, periodically or continuously, for at least 100 years” is of importance for the predicted sea level changes due to climate change. In this regard, it is also worth mentioning that, according to the author, the term “underwater” on this definition would include discoveries embedded in ice at the Poles or in the Arctic Oceans since ice is merely frozen water. However, and despite this minor concession, the Convention does not explicitly mention “climate change” and as a consequence, it does not propose solutions. Neither the 1982 UNCLOS Convention does.

On the 1st February 2011, *Seabed Disputes Chamber of the International Tribunal for the Law of the Sea* released an agreement (as an annex to UNCLOS) on the responsibilities and obligations of States sponsoring persons and entities with respect to activities in the area. However, in the text there is no reference to the maritime or underwater cultural heritage. There is no mention either to climate change.

The *UN Framework Convention on Climate Change* (1992) has no direct reference to underwater cultural heritage, nor does the *Kyoto Protocol* (1997) aim to reduce the levels of greenhouse gases.

In national agendas, the inclusion of underwater cultural heritage on climate change policies is not too different. The *UK Government Review of economic consequences of*

climate change does not include any mention of heritage or archaeology (Flatman, 2009: 6). English Heritage, however, has implemented a National adaptation program with two responses to climate change: mitigation and adaptation (Dunkley, 2013). UNESCO has already adopted a climate change strategy for World Heritage Sites (World Heritage reports, 2007: 22). However, this report, does not address a solution to underwater cultural heritage. Only the final article states:

Responses may include monitoring, maintaining, managing and/or carrying out further research – all within the framework provided by a site’s management system. At this point best practices solutions may be considered (30th session of the World Heritage Committee, Vilnius, 2006: 55).

However, the instruments that try to cover the topic provide good intentions rather than solutions. They make a good starting point for the development of the field, although they tend to be vague and imprecise and no remedies are proposed. As a consequence, there is a need for ranking the potential impact of climate change on individual heritage and determining the vulnerability, sensitivity and resilience to future changes (Howard, 2012).

In addition, the legal mechanisms neither protect underwater cultural heritage from climate change, nor provide the specific instruments to protect it. The *2001 UNESCO Convention for the Protection of the Underwater Cultural Heritage* states preservation *in situ* as the first option,

in the preamble,

[the UNESCO] Convinced of the public’s right to enjoy the educational and recreational benefits of responsible non-intrusive access to *in situ* underwater cultural heritage, and of the value of public education to contribute to awareness, appreciation and protection of that heritage [...]

Committed to improving the effectiveness of measures at international, regional and national levels for the preservation *in situ* or, if necessary for scientific or protective purposes, the careful recovery of underwater cultural heritage, [...]

in the main text,

Article 2.5. The preservation *in situ* of underwater cultural heritage shall be considered as the first option before allowing or engaging in any activities directed at this heritage,

and in the Annex

Rule 1. The protection of underwater cultural heritage through *in situ* preservation shall be considered as the first option. Accordingly, activities directed at underwater cultural heritage shall be authorized in a manner consistent with the protection of that heritage, and subject to that requirement may be authorized for the purpose of making a significant contribution to protection or knowledge or enhancement of underwater cultural heritage.

The next section of the chapter will analyze the term preservation *in situ* and the consequences for underwater cultural heritage if climate change takes place.

IV.5. Ethical dilemmas on preservation

IV.5.1. What is preservation in situ

Preservation *in situ* is the first option under the 2001 UNESCO Convention. However, as some authors claim “it forms just one part of management and not (as often interpreted) the only right way forward” (Manders, 2003: 31).

Khakzad and Van Balen (2012) address different kind of possibilities for the conservation of underwater cultural heritage .

1. Displacement of the underwater heritage to shallow waters or moving it onto land for relocation or incorporation in museums: the disadvantage is the difficulty

to safeguard the values of the heritage since it is deprived of its archaeological and environmental context, which makes it lose significance.

2. *In situ* methods that complies with the Convention and preserve it for the future generations but that may not be the best option in the future due to climate change. Preservation *in situ* may include different techniques, like sandbags, polypropylene debris netting, sand deposition or artificial sea grass (Manders, 2012). Preservation can also be benefited from technology, like the development of underwater vehicles to clean the hull of large ships (Ballard and Durbin, 2008), although the artefacts would not remain intact. The contra of this option is the difficulty of the exhibiting to the public. However, with the improvement of technology, *in situ* public access to submerged cultural sites can be achieved through telepresence technology, for instance high-speed data communications on a real time basis (Ballard and Durbin, 2008) preserving the remains in undersea museums. However, if this option is chosen shipwrecks would have to be monitored and regularly examined to avoid deterioration, as some author stress (Manders, 2012; Khakzad and Van Balen, 2012). With this method, preservation *in situ* can be a reality but climate change will always affect. Different options are available inside this possibility (Khakzad and Van Balen, 2012):

2.1. *In situ* protection: exploring the site, covering it and restricting access.

2.2. *In situ* conservation: intervening the site and stabilizing it but still making it accessible to visitors.

2.3. Reburial the site: covering the site but continuously monitoring it. This option can recreate the original condition of the site.

2.4. *In situ* preservation and presentation: transforming the site in underwater parks, aquariums or submerged museums (Aguilar, 2013). This option will be more common when technology and techniques develop and the ideas for its access will evolve.

However, to be able to preserve *in situ* one must first know what it entails (Manders, 2012). Some authors state that the essence of *in situ* preservation is equally debatable for land or underwater (Khakzad and Van Balen, 2012). However, the changes that climate change will bring to the oceans will be different to the ones that will take place on land and as a consequence underwater cultural heritage should receive a different consideration. In addition, artefacts under water cannot be treated equally. Some factors would determine if artefacts should be left under the sea or be recovered. For instance:

- the size of the artefact: It is not the same trying to lift a huge ship than a small boat. The scale of the excavation and preservation measures is going to be different. The funding and the research interests will be poles apart.
- the depth: Artefacts can be totally submerged, almost at the surface or totally on land. The preservation on land could be more accessible to the public and still have the necessary preservation measures like humidity, worm and microbe protection.
- the state of preservation: Lifting a corroded artefact or an object in perfect conservation condition should be considered differently.

IV.5.2. *In situ preservation arguments*

Preservation *in situ* is the first option under the 2001 UNESCO Convention for both pragmatic and philosophical reasons (Manders, 2012). Aplin (2002) argues that

preservation *in situ* on land is best for two main reasons: to save the items and for the item to be accessible and visited by the public.

The *in situ* option was not a new principle in the 2001 UNESCO Convention but an archaeological option unanimously already adopted by the archaeology scientific community in the *Sofia Charter* (1996) a non-legal text. However, the term was adopted for land archaeology, where both accessibility and preservation was guaranteed. In this regard, for Wreckwatch (2011) *in situ* preservation was only reinvented as a broad tool to protect underwater cultural heritage and that it is just a tool of bureaucrats and lawyers. As a consequence, and in order to evaluate the principle, Wreckwatch (2011), sent a questionnaire:

to marine archaeologists/archaeological divers who have managed an underwater project or served as a supervisor on such a project; to university personnel who teach/support marine archaeology; heritage personnel (museums, charitable bodies, independent organizations) involved in management issues and policy in marine archaeology; and specialists involved in the study of artefacts derived from underwater cultural heritage (conservators, ceramic/hull analysts)

on their opinion about the preservation *in situ* strategy adopted by the 2001 UNESCO Convention. According to the questionnaire, 57% felt, that as an overall fundamental management policy, the application of *in situ* preservation to underwater cultural heritage is a positive strategy. A further 43% felt that it was not.

However, in answer to this questionnaire, Maarleveld (2011b) replied that he would not complete the questionnaire since it was based on a faulty assumption:

the idea of the *in situ* preservation of underwater cultural heritage is the most dominant managerial concept in marine archaeology today. Centre stage of the *2001 UNESCO Convention on the Protection of the Underwater Cultural Heritage* (Article 2.5, 2.10,

Annex Rule 1), it generates strong opinions about what this tool is intended to do and its repercussions on fieldwork²⁶

For Maarleveld (2011b), the rule of preservation *in situ* does not reduce a central principle to a management tool. For Forrest (2010: 341-2),

the principle of *in situ* preservation does not therefore mean that underwater cultural heritage is never recovered, only that it is recovered for a sound reason, and only after pre-disturbance archaeological investigation has been undertaken”

This section summarizes the main pragmatic and philosophical reasons in favour of preservation *in situ*:

a) Preservation *in situ* pragmatic reasons:

1. The number of discovered sites: as both, technology and development on the fields happen, the number of archaeological sites underwater discovered is growing fast, although they cannot be all studied (Manders, 2008).
2. Cost effectiveness: first, there is not enough funding to preserve every underwater archaeological remain on land. Second, interventions under the sea are expensive because special equipment is necessary (Manders, 2008). Last, costs of assessing, analyzing, conserving and recording the material *ex situ* is considerable, and, if recovered, the remains conserved in a museum have to be curated in perpetuity (Corfield, 1996).
3. The time gap between discovery and excavation: the main aim in underwater archaeology is to create an accessible archive underwater, and not to recover every site. Excavations will be carried out only if necessary and, in this case, after time studying the site *in situ*.

²⁶ Scuba community. 2nd August 2011. Available at: <http://www.yorkshire-divers.com/forums/showthread.php?t=167146>

4. Lack of conservation knowledge: deterioration processes are not still completely understood as is the case of the rusticles of the *Titanic* (Mann, 2011) or the sulphur problems threatening both the hulls of the *Vasa* and the *Mary Rose* (Manders, 2008).
5. Slower degradation: projects, such as MoSS (*Monitoring of Shipwreck Sites*) and BACPOLES (*Preserving cultural heritage by preventing bacterial decay of wood in foundation poles and archaeological sites*) have proven that *in situ* preservation can slow down degradation (Manders, 2012).
6. Deep-sea wrecks act as artificial reefs: shipwrecks that have become artificial reefs attract loads of species of plants and animals. The research indicates that shipwrecks in deep water are likely to serve as hard surfaces, supporting hundreds of life forms.
7. Some studies can be investigated only under the sea: what is the environment of the ship, the exact location, possible reasons for sinking or how some materials are preserved under the sea after several years. Also, by taking away the source, it will be impossible to answer other questions (Manders, 2004). Underwater sites should be treated as underwater archives (Manders, 2003).
8. Development of robotics and telepresence technology to preserve and make a submerged cultural site accessible for the public (Ballard and Durbin, 2008): it will also provide high-speed data communications on a real time basis on the state of the shipwreck, and its current state of

deterioration, proceeding with the preservation right away if the shipwreck or the item is in immediate peril after a change of current, for instance.

9. The precautionary principle: it has to be preserved for common heritage.

b) Preservation *in situ* philosophical thoughts:

1. Need for evaluation and significance in its context: the shipwreck in an archaeological context, where all the remains share homogeneity of the event and conditions (Gibbins and Adams, 2001). This context is where it can be best evaluated.

2. Preserve it better for the future: introduction of the 2001 UNESCO Convention states that States Parties should guarantee that underwater cultural heritage will be preserved for the future and *in situ* (2001 UNESCO Convention: 11).

3. Decontextualizing the object means the loss of part of its authenticity: the difference between seeing an anchor in a museum and seeing it under water. Delgado (2009: 56) states that “the best and largest museum of all lies in the bottom of the sea”.

IV.5.3. In situ preservation counter-arguments

1. Some artefacts are better preserved outside the sea: some materials better withstand water exposure than others. *In situ* preservation as a first option has been doubted by some authors who indicate that the corrosion rates of buried metal artefacts are growing (Caple, 2008).

2. Some studies can be only carried out in special laboratories, whether for preservation or for research.
3. Some ships are a danger to the environment or to current navigation: some shipwrecks can still have fuel or ammunition which carries potential health, safety, and environmental risks (Sayle *et al.*, 2009). Furthermore, some metals pollute the water (Mann, 2011). Plenderleith and Werner (1971) considered as the most contaminant materials aluminium, silver, cadmium and copper. These materials are usually used in ship construction.
4. Underwater cultural heritage is for the benefit of humanity (Article 3.2, 2001 UNESCO Convention). As a consequence, it has to be enjoyed by all. Under water, it is less accessible.
5. Preservation *in situ* can slow degradation, but does not stop deterioration (Manders, 2012). As Gearey and Chapman (2006) state not only direct process affect wet deposits, such as development, but also indirectly, such as water abstraction, for instance. As a consequence, underwater cultural heritage will inevitably disappear in the future if preserved *in situ*.
6. Different resources are being used for new energies, such as osmotic power (energy obtained from the difference in the salt concentration between seawater and river water), oceanic winds or wave power (Fernández, 2013). These resources arising from the sea can be used as natural energies helping to stop climate change, but this use of the oceans can conflict with underwater cultural heritage *in situ* protection.

7. Submarine pipelines and cables: the high seas freedom policy allows companies to lay submarine cables in any part of the high seas even if there are archaeological deposits underneath. In 2010 some shipwrecks were discovered in the Baltic Sea when preparing the seabed for installation of the Nord Stream natural gas pipeline. Some of these shipwrecks were more than 1000 years old²⁷. The shipwrecks were not in the path of the pipeline but they were in the anchor corridor, which is the area where the ships lying down the pipeline will anchor. Furthermore, these paths are multiplying. In fact,

thousands of kilometres of submarine cables lie on or under the seabed carrying telephone calls and internet data (only 1 % of telecommunications are established via satellite). In 2013, 283 cables are active with 29 new routes planned (Perez-Alvaro, 2013b: 14).

8. Technology is continuously improving which will benefit the progress of underwater archaeology and it may be that the pieces will not be damaged when studied.

9. Climate change: if climate change keeps progressing, by the year 2050 global temperatures will have crossed the threshold of 2°C above the level prior to the industrial revolution (Cassar and Pender, 2005). Sea level will have raised another 30 cm since the year 2000 and by the year 2100 temperatures will stand at 5°C above the average (Rahmstorf and Richardson, 2009). Changes will take place and underwater archaeological remains will be affected.

²⁷ *The Free Library*. S.v. Nord Stream pipeline probe uncovers shipwrecks in Baltic Sea." 27th Apr 27 2015
Available at:
<http://www.thefreelibrary.com/Nord+Stream+pipeline+probe+uncovers+shipwrecks+in+Baltic+Sea.-a0225588584>

IV.5.4. *The ethics behind preservation in situ*

Climate change has a central moral component and the ethical dilemma is the core of all challenges (Sheridan and Sheridan, 2013). What is the right thing to do now? (Sheridan and Sheridan, 2013). Different ethical dilemmas arise from this chapter:

1. Imperativeness: the impact of climate change on underwater cultural heritage is real and although it might be a point of no return, it can be a manageable one. The nub of the problem is not the necessity of evaluating and deciding predominant values to determine what we should preserve but why we should preserve it and how. The problem is the necessity of prompt decisions since climate change is already happening (Corfield, 1996).
2. Convenience on the definition of the term: is preservation also the relocation of sites and material? This can be a way to make it more possible. But is it preservation *in situ*? Ports or villages cannot be displaced. What is going to happen to them when climate change erode them or damage them?
3. Exhibition vs preservation: is working in favour of the *in situ* preservation UNESCO guidelines investing in reality? Because climate change may be damaging in the long term. As preservation *in situ* is still today the first option under the 2001 UNESCO Convention, different solutions, especially through technology, have been created to make shipwrecks more accessible to the public (Ballard and Durbin, 2008). Managing a submerged cultural site needs to benefit society (Ballard and Durbin, 2008). However, maintenance and condition monitoring will become more critical as climate change takes effect (Cassar and Pender, 2005). Creation of underwater parks and heritage trails are a good option

now for accessibility but they may not be a good option for its preservation in the future.

4. Preservation *vs* development: with the mushrooming in telecommunications there will be an increase in developing new technologies using the oceans, laying submarine cables or establishing energy fields. None of these forms of industry, crucial to the wellbeing of humanity, incorporate enforced offshore cultural heritage policies (Kingsley, 2011). Neither do climate change reports mention underwater cultural heritage as a concern.
5. If efforts by international and national organizations are aimed at helping to avoid climate change, are we also avoiding damage to underwater cultural heritage? The oceans are being used as a cure for climate change through ocean nourishment (feeding algae with iron oxide) (Flatman, 2009: 6). Therefore the oceans as well as cultural heritage are facing the same issues. Uniting efforts to fight against climate change will offer broader solutions: the legal instruments governing underwater cultural heritage should include policies to mitigate the effects of climate change. This could include allowing ocean-based energy systems even if their installation damages in the short term underwater cultural heritage. The pillars of prevention might be mitigation, adaptation and climate engineering (Ganje *et al.*, 2011). This adaptation could include also an open mind on the preservation of underwater cultural heritage because there is a close interrelationship between the environment, culture and human behaviour (Sheridan and Sheridan, 2013). Whereas the term “marine environment” has traditionally been applied to refer to the natural environment and the living resources therein, it is now recognized that cultural heritage resources are part of that environment as well and the inextricable link

between both means that the protection and treatment of one must contemplate the consequences for the other. Maybe it is time to adopt the concept of sustainability from environmentalism as the prime motivator for underwater cultural heritage protection (Kingsley, 2011).

6. Can preserving underwater cultural heritage help to mitigate climate change effects? Metal corrosion, pollution or munitions on board of the wrecks can damage local areas which may be small parts of the global picture but still important. Cooperation between different organizations (biologists, oceanographers and engineers) creates a synergy on actively reporting processes and proposing adaptation measures that could establish solutions for, as previously said, rowing in the same direction (UNESCO, 2008).

IV. 6. Conclusions

As this chapter has tried to demonstrate, rises in sea levels, warmer waters, ocean acidification and changes in currents will affect underwater cultural heritage (Dunkley, 2013). Warmer waters mean more energetic oceans (that cause more erosion) and the migration of invasive species. It also means expansion, which will cause the problem of oceans delimitation. In addition, this rises in sea levels will reduce the amount of time and productivity an air-breathing diver can spend under water safely. In addition, saltier waters mean less clear waters. Changes in ocean temperatures also affect and alter oceanic currents which will have an impact on underwater visibility for divers besides of the erosion of the heritage. And although the direct effects of acidification are not still well understood (but it is known that will harm marine fauna) it increases the current rates of metal corrosion, which will be particularly harmful to the underwater heritage of the World Wars (Dunkley, 2013).

Each site deserves unique treatment and it is difficult to set a common criteria. The climate change consequences on heritage need different strands of research, like risk factors, socio-economic research and nature and cultural stress factors (UNESCO, 2008). Some authors predict that future generations will face damage and loss of underwater cultural heritage or will have to make great efforts to protect them (Marzeion and Levermann, 2014).

However, as Sheridan and Sheridan (2013) observe, it seems that people may need to see their cultural heritage threatened, temples washed away or cathedrals destroyed by flooding to be convinced of the effects of climate change in culture and to evaluate and propose solutions. However, it is erroneous to assume that the most visible remains are the most threatened. There is a need for practical and political response to the effects of climate change on underwater cultural heritage but also a priority of raising awareness of the impacts. Some authors emphasise the inadequate financial resources and a lack of creativity on managing underwater cultural heritage despite it being a growing “industry” (Kingsley, 2011). Some inter-agency cooperation might be necessary (Van de Noort, 2013), as well as convincing policy makers to include climate change impacts in planning (Cassar and Pender, 2005).

The preservation of underwater cultural remains has to be formally challenged. It is time to think whether preservation *in situ* under the 2001 UNESCO Convention offers, as some authors maintain (Kingsley, 2011), precious few new and progressive initiatives. It is time to question if, as for this author, preservation *in situ* is “to put all the eggs in one basket” (Kingsley, 2011: 225).

This chapter proposes the inclusion of underwater cultural heritage as natural heritage, which is another subject on policy agendas for protecting the world’s oceans from

climate change. The differentiation between cultural and natural is a barrier that excludes underwater cultural heritage and avoids a common interdisciplinary work, as it will be seen in the next section.

IV.7. Proposal

Preservation *in situ* is the first option of archaeologists for preserving the heritage, both, land and underwater. The new paths developed for making underwater cultural heritage accessible to the public, such as visiting the site by diving (or snorkelling in shallow sites) in the shape of (1) underwater parks and reserves (Aguilar, 2013), (2) museums that take you underwater (the unexcavated ship inside the *Maritime Silk Road Museum* in Guangdong, China) or (3) taking the museum out of the building, like the above water museum in Alexandria with an underwater area (Manders, 2003). Kingsley (2011) also observes that nobody wants or can afford another *Mary Rose* (which brings the ship out of context, anyway) and as a consequence new paths need to be explored.

However, this approach of making underwater cultural heritage *in situ* more accessible to the public contrast with the peril that this heritage will suffer due to climate change. Chapman (2003) alerts that its implications are likely to be far-reaching although, as the author recognizes, they are not still understood. In this regard, the bibliography for solutions is scarce and land archaeology policy makers do not offer too many answers either. As Chapman (2003) points out, references to archaeology in climate change arenas are rare. The most common proposal, consisting of monitoring underwater cultural sites (Chapman, 2003; Dunkley, 2013b) will help to understand the problem but will barely have an effect on it.

Some organizations advise on guidelines to follow to avoid climate change. English Heritage recommends a limitation of further dangerous emissions and of working on projects such as risking assessment, adaptation and mitigation.²⁸ It also recommends broader actions such as advice for home owners, energy efficiency or renewable energy. However, more specific actions in relation to underwater cultural heritage have to be taken.

The present study focuses the required actions in four steps: recognizing the loss, starting the debate, creating a legal framework in which situate the debate and recognizing underwater cultural heritage as a natural resource.

1. Recognizing the loss: there have already been two periods of climate change in the past which could have affected the heritage. It is essential to understand that although climate change does destroy the heritage, it also creates new heritage (for instance flooded cities or islands will become underwater cultural heritage in 100 years). Again this is the ethical issue on heritage as process: understanding that it is inevitable to lose some cultural heritage but that we will also gain some. On these premises, however, it is again the time to evaluate the importance of the sites and to undertake actions to preserve the selected ones.

2. Starting the debate: climate change debate has occupied few concerns in the archaeological and heritage arena. Whatever the causes, the effects may be devastating (Chapman, 2003). This chapter has tried to trigger the debate, which needs to be discussed and disseminated through academic, social and political agendas.

²⁸ English Heritage. Advice: Climate Change. Available at: <http://www.english-heritage.org.uk/professional/advice/advice-by-topic/climate-change/>

3. Creating a legal framework: the 2001 UNESCO Convention that guides States on the management of their underwater cultural heritage does not include climate change as a danger to the heritage. As with any other international instruments, the authors of the Convention would hope to become an example to the states (Carman, 2013). If this Convention does not take climate change into consideration neither will States. In this regard, the regulations governing terrestrial matters, which always appear before those governing underwater matters, can help to offer solutions. However, this dissertation presents a high risk concept: underwater cultural heritage is a part of the oceans and as a consequence underwater cultural heritage preservation has more similarities to *underwater natural* heritage than to *terrestrial cultural* heritage. Although the methodology (archaeology) and the ethical concerns that both underwater and land heritage face have a major equivalence, in the aspects of preserving and facing climate change underwater cultural heritage has to fight the same battles as the natural heritage in the oceans. The changes that will affect them are the same. As a consequence, the same legal and political agendas on climate change affecting the oceans should already include (as coral reefs are included) underwater cultural heritage on their agendas.

4. Recognizing underwater cultural heritage as a natural resource: Aznar-Gómez (2013) states that although underwater cultural heritage is not considered a natural resource by the UNCLOS Convention, the seabed and the sand is covering the archaeological objects. Also the non-sedentary fishing species live around artificial reefs made by shipwrecks. For this reason, some authors (Rössler, 2006) have tried to link cultural and biological diversity for the better preservation of underwater cultural heritage. In fact, the *1972 Convention Concerning the Protection of the World Cultural and Natural Heritage* is an instrument for the preservation of both,

cultural and natural heritage. The category of cultural landscape recognizes an intangible value of the heritage, for instance as “sacred places” (Rössler, 2006). Aplin (2002) argues that distinction between natural and cultural heritage is blurred and Chapman (2003) reminds the close relationship between ecological and archaeological site management and suggests a liaison between archaeologists and other parties interested in natural environment. Lixinski (2008: 379) claims that the “nature and culture dichotomy” listed in the *1972 World Heritage Convention* is simply artificial, as it is proved to be in the wording “the combined works of nature and man”. According to the author, the holistic approach to heritage seen as “significance” and not as a place or as an object blurs that dichotomy. Accordingly it is necessary to adjust natural policies on the oceans to accommodate underwater cultural heritage. If shipwrecks are considered artificial reefs, the same preservation policies applied to natural reefs can be applied to the artificial ones (that is, underwater cultural heritage).

Chapter 5. The sinking: Discussion

This work has attempted to highlight ethical issues that challenge the legal instruments that protect underwater cultural heritage in particular and cultural heritage in general. The approach for this goal has been to raise four cases that questions four main pillars that have been taken for granted on the cultural heritage policies: valuation of heritage, uses of heritage, management of heritage and preservation of heritage.

Decisions on management of underwater remains need to be made based on values of the material and most of these decisions are governed by ethics (Coroneos, 2006: 111). As some authors state (Manders *et al.*, 2012), the value or significance of a site is determined by quality, quantity or age. However, the legal instruments that are applied to protect the heritage, although they can offer a legal umbrella, can also present problems if they are not carefully drafted.

The complex ethics of land archaeology are now being faced by underwater archaeology. When talking about ethics, is not necessarily the case that looting an underwater cultural heritage site is wrong. Ethics, as we have seen, can involve grey scale decisions. However, although ethics aspire to be universal and resolve dilemmas, most of them need to be evaluated on a case-by-case base. Those who argue that shipwrecks are eroded by natural and cultural forces, for instance, and that it is better to recover them, are trying to make the best of a bad situation (Coroneos, 2006: 121). Ethics should take priority over pragmatism and there are always choices.

In underwater cultural heritage, legal efforts have been directed to fight against treasure hunters: commercial salvage aims to bring items to the surface as efficiently and fast as possible to maximise the return on sale. Salvage techniques can be too destructive for archaeological purposes and archaeological techniques too slow for the economy of commercial salvage. For instance, the already mentioned salvage law expects the circumstances of modern shipwreck where the name and ownership is known. So it struggles with historic wrecks whose name and ownership is unknown or uncertain. It will not fail with Classical or prehistoric wrecks which did not know ownership or “flagging” by a nation-state of modern type. This is because salvage laws and heritage laws are directed by different values: theoretically, under heritage laws, underwater excavations must provide evidence of provenance and preservation *in situ*. In practice, salvage laws (linked to commercial value) have historical precedent and prevails. In fact, and although over centuries archaeology as a field of study has advanced from searching for treasure to searching for knowledge, salvage is still in a world of treasures: the lure of sunken treasures. At the heart of these problems is the issue of funding excavations: excavating a shipwreck is an expensive venture. In fact, Bass (2003) believes that treasure hunters make more money by enticing investors than by finding treasures.

However, for some authors, the main issue surrounding commercial salvage is not concerned with the rescue of the archaeological pieces but with the commercialisation of the objects that are rescued. For archaeologists, archaeological objects can offer information in the future when technological instruments may develop: destroying or selling them can deprive humanity of essential knowledge. As a consequence, from the archaeological perspective, objects run the risk of being treated just as a piece of information, emphasising a “material” value. As we have seen, management of underwater cultural heritage is not which objects we obtain but how we interpret them according to

their archaeological context, where they have been found and according to the material and data that we already have. Archaeology actually functions as a scientific tool to extract meaningful information about human behaviour from the material record regardless of age. However, as we have seen, cultural heritage has other values that cannot be obviated.

There is a close connection between heritage management, archaeology and national agendas (Maarleveld, 2011: 921) and although economy must not be a factor on management of underwater cultural heritage in terms of tourism, it can attract visitors which have the right to enjoy the heritage. For instance, diving and culture can meet in underwater archaeology. Divers could be trained in the prospection of shipwrecks and in an archaeological background so they could work for the governments on the protection of underwater cultural heritage by enjoying their hobby, a project that it is being already done in Cataluña, in the north part of Spain (Aguilar, 2013). Some other solutions could be the duplication of artefacts. It is also necessary that archaeologists understand that not everything can be kept and exhibited in museums. So it is essential to classify and to select only the most important artefacts for our culture, especially if there are many samples of the same objects, such as coins. The less important objects can be sold to other important museums, galleries or private owners and the money received from these sales could be the funding for the next underwater archaeological excavation.

Negotiations between countries or between countries and private companies stand at a crossroads (O'Keefe, 1996). It is necessary that archaeologists and salvors discover a method to ensure a balance between commercial exploitation and heritage preservation. Nevertheless, some authors are opposed to an agreement between underwater archaeologists and salvage companies: Bass (2003) claims that in the same way that land archaeologists are not asked to cooperate with tom robbers, underwater archaeologists

should not be asked to cooperate with salvage companies. In this regard, one of the main factors, which I did not anticipate to be such an important issue, is the traditions that are so deeply-rooted in cultural heritage management. New questions are barely asked and old precepts are barely challenged. The bibliography still fights against old enemies and does not visualise new ones. However, this work considers that progresses and changes in the rest of the fields develop faster than archaeological debates and legal revisions. The cultural heritage management is anchored in old controversies. Like medicine, archaeology needs continuously fresh debates on newly arising dilemmas. This work proposes a new reassessment of the damaged done by treasure hunters and the one that will be done for the future ethical conflicts. Maybe the efforts should be targeted to the last ones.

However, according to some authors (Coroneos, 2006: 121), the basic principles of archaeology are immutable; only the practice of archaeology changes. In this sense, approaches to cultural resource management have created controversies between the different communities. The community is relaying its history, its past and in some way its future in the hands of archaeologists (Coroneos, 2006: 112). How those elements are going to be managed and not manipulated will build the history of an individual, a community or a national. So archaeologists should serve those communities as much as a doctor or a teacher does, with the same ethics of responsibility and diligence: they need to adapt to new obstacles as part of their responsibilities.

The results of ethical reflections are written and unwritten codes and rules. However, new development and new interest complicates the matter (Maarleveld, 2011). If those legal instruments are not carefully drafted, there is a danger that more ethical controversies will be introduced into the debate. Society needs to understand that legal tools should not be eternally untouched: they need to be continually reviewed to catch up

with the developments on the field. These developments have to be taken into account and national legal regimes in this field reviewed.

The next part will draw on some of the main conclusions highlighted by this study, first in relation to each one of the four main case studies and after the general conclusions. This will be followed by a summary of the proposals developed by this dissertation for each one of the four case studies and a general advice for the future of the management of the underwater cultural heritage.

5.1. Specific discussion

I. Valorisation: violin of the *Titanic*. The first conclusion that I want to highlight from this chapter is that although the 2001 UNESCO Convention set 100 years as the limit for the protection of the underwater cultural heritage, the reality is exemplified in this case study by the fact that some sites must be treated as being more significant than others (Manders *et al.*, 2012). The definition, claiming a time number, not only excludes important sites but also includes not so important sites. Four main questions arise from this case study:

1. The law has decided upon what is and what is not heritage and what should or should not be protected. The violin, being a unique piece of heritage, is not protected under the 2001 UNESCO Convention. However, the 1000 ingots of ancient lead with no particularities among them are protected under the Convention. The law, as a consequence, has decided which heritage is worth being protected.
2. However, the previous assertion assumes that the violin is heritage and not a product of interpretation by the museum curators, the media and the

auction market. A sense of prosthetic memory can confuse the heritage with a feeling of heritage. The fine line between these two possibilities is blurred and it needs to be well defined.

3. The issue of private property and public property raise various controversies: the violin was a private property object that belonged to the violinist, then to the fiancée and then to all the proprietors that have been buying the object. As a consequence, its auction has been just the logical step in this path. However, if the violin is found to be a piece that should benefit everyone, seen by all and enjoyed by all, the violin should be either public property or private property establishing certain responsibilities for the owner and certain rights for the visitor. In either case, however, a final question has to be addressed:

4. Preservation of the violin as a museum object or as a sound window will highlight different values. Table 5.1. summarises the different values that a piece of heritage has according to the *Training Manual for the UNESCO Foundation Course*. All the values will be analysed establishing a comparison between preserving the violin as a sound window and preserving it as a museum object.

VALUES	SOUND WINDOW	MUSEUM OBJECT
YIELD IMPORTANT INFORMATION ABOUT THE PAST, INCLUDING ARCHAEOLOGICAL	It would bring information on how the violin sounded	Its construction, provenance of the materials, any modifications, etc. All the tests of provenance have been done, it is difficult it offers any more information ²⁹
HISTORICAL SIGNIFICANCE	Its music [or sound?] has importance on an event in cultural history	The object <i>per se</i> has importance on an event in cultural history
SCIENTIFIC SIGNIFICANCE	Its sound could provide information on current <i>Luthiers</i>	It has been researched already with Scanning Electron Microscope and X-ray Microprobe. No more tests are expected ³⁰
AESTHETIC SIGNIFICANCE	It could lose its actual aesthetic in the reconstruction. However, it being played makes it a violin again, and not just an object. This is also aesthetic significance.	As an object in a museum
SOCIAL OR SPIRITUAL SIGNIFICANCE	As a funerary object. But also as a symbol of being played during sinking.	It loses the emotional answer to the music from the touristic point of view
EXPERIENCE SIGNIFICANCE	Listening to it would trigger the stories [collective memory and emotions] around the <i>Titanic</i> .	Seeing it would trigger the stories around the <i>Titanic</i>
ECONOMIC SIGNIFICANCE	Invaluable	\$1.7 millions
PROVENANCE	Violins coming from different provenances sound different	Would be the same one
REPRESENTATIVENESS	Its sound from the sunken. As a trigger of memories.	As a violin recovered from the <i>Titanic</i>
RARITY/UNIQUENESS	The only one that was played that night on the <i>Titanic</i>	Historical instruments are relatively rare, but not unique. An early 20 th C German factory violin is not rare. However, this is the only one from the <i>Titanic</i>
CONDITION	Can be played	Can be exhibited
INTERPRETATIVE POTENTIAL	Can emotionally bring a story	Can tell a story

Table 5.1. Comparison of values as a sound window or as a visual window

²⁹ In this regards, as we have seen, it has been suggested that new techniques in the future can bring to old objects of collections new information revealed.

³⁰ Some authors (Manders, 2012) establish that it is the questions you ask that give you the answers. So there might always be new questions to ask as long as the evidences are not destroyed.

II. Use: ancient lead. Underwater cultural heritage faces a new controversy: it can assist particle physics to obtain more knowledge about dark matter. However, if their characteristics are of benefit to other fields, such as microelectronics or medicine, their use will be more demanded each time by actors whose only end is not the economic profit. In land archaeology, several parts of the heritage are sacrificed *in pro* to the development of other disciplines or commodities: villages are moved for construction or motorways or reservoirs, as in the case of the Spanish village of *Mequinenza*, in the north of Spain, that was moved in order to build a reservoir: the bell of the old church can still be seen coming out from the water when the reservoir is low. The question is why this kind of public work has allowed the destruction of cultural heritage and the destruction of heritage in favour of researching particle physics is still a source of controversy.

In addition, if those laboratories do not have the opportunity to buy a lead that has already been analysed and recorded by an archaeological institution they will need to buy it from private companies that offer the lead. The archaeological community should not have, as a consequence, adopted a position that is a denial of the reality and existence of other fields that may use the heritage but a position of triggering the conversations and offering solutions.

This case study has furthermore exposed how these experiments do not contravene most of the articles of the 2001 UNESCO Convention and the UNCLOS Convention. As Maarleveld (2008) claims, the UNESCO identifies between the activities that “incidentally affect” underwater cultural heritage and activities that are “directed” at it. It is only the interpretation of the term that will categorise experiments using the underwater cultural heritage inside one category or another.

III. Management: watery graves. Respecting the wishes of the owners of human remains means that some activities have to be forbidden (Aplin, 2002). And although Bryant (2001) claims that since historic shipwrecks are unlikely to contain human remains they can be salvaged and the grave disturbed, this chapter has proved that several shipwrecks still contain human remains and as the shipwrecks sunken get closer in time, it will be more likely to contain them.

Since most of the earth is covered with water, burial at sea can be seen as an accepted norm for seamen all over the world. And those buried human remains can offer knowledge to archaeologists not reachable by other means. Different legal agreements in relation to archaeological practices have been established as common ground for the treatment of human in the sense of “respect”. However, what is respectful for some communities or professionals may not be for others. As Saunders (2002) mentions, excavating human remains is a memory-making activity that has to be regulated in order to reach a balance between families of the deceased and benefits for the communities.

The case study has divided the dilemmas between values (cultural, temporal, scientific and funerary), guardians of the deceased (surviving relatives and indigenous communities) and the subject (that is the human remains that generates controversies such as the preservation of war graves and civil graves, the different nationalities of those on board or the case of the slavery ships that we have called “nationless” shipwrecks).

IV. Preservation: climate change. The effects that climate change will have in the oceans have been the leading clue to understand the effects that, as a consequence, climate change will have on underwater cultural heritage. Changes such as the

warming of the waters, the raising of sea levels, ocean currents and chemical changes (acidification and salinity) have been analysed in relation to the effect on each one of the materials that can be found in an underwater cultural heritage site. Materials such as waterlogged wood, other organic material metals and others such as ceramics, glass or stone will suffer the climate change in the oceans.

However, the legislation dealing with climate change in international agendas do not mention underwater cultural heritage inside the proposed measures on the fight against climate change. On the other hand, the precept of preservation *in situ* that has been long established in cultural heritage management does not take into account possible future changes that may challenge that preservation *in situ* is the preferable option. Preservation *in situ* will be an option if joint efforts from the different actors protecting the seas are directed in the fight against climate change. Treating underwater cultural heritage as a completely different element to natural heritage such as fish, reefs or flora prevents the seas being understood as a unique object to protect.

5.2. General discussion

As well as the specific conclusions that this work has reached after careful analysis of each one of the main case studies of this dissertation, there are other notes that need to be highlighted:

1. Definition of underwater cultural heritage under the 2001 UNESCO Convention has been questioned by all four case studies:

- for the violin of the *Titanic* for not having been under water for more than 100 years but belonging to an archaeological site considered underwater cultural heritage.
- in the case of ancient lead 1000 ingots that are exactly the same are protected by the Convention just for being underwater for more than 100 years.
- human remains are underwater cultural heritage. So all the articles in the Convention have to be applied to them, including, for instance, benefit for humankind and preservation *in situ* which may contrast with the ancestors and descendants' wishes.
- climate change may bring new underwater cultural heritage since it will cover some current land locations but it may also destroy other underwater cultural heritage.

The definition, as a consequence and, in the opinion of this work, should be the basis for a valuation and appreciation of the underwater cultural heritage and not according to a time limit. The 2001 UNESCO Convention contains both ethical principles and measures. However, it needs to be continuously updated.

2. Underwater cultural heritage management embraces a wide variety of groups: academics, tourism, education, coastal development and even private companies (Kingsley, 2011). Excluding any of these groups from the management policies means that those groups will still carry out their business but in a controversial way. It is necessary to think about the general benefit, consider the own goals and be flexible with other points of view. For instance, according to Bederman (1999) the

fishing industry has been the largest user and destroyer of wrecks as artificial reefs. However, fishing cannot be forbidden just for the benefit of the preservation of the underwater cultural heritage. Only rules for their coexistence can be established.

3. A major controversy that has been common to all four case studies has been the duality between individual and humanity. In the violin of the *Titanic* we have highlighted the private property of the violin against the right to enjoy it by humanity. In the case of the ancient lead, however, there is a case of dispute between humanity against humanity: a knowledge benefit for humanity against knowledge also for the benefit of humanity. In the case of the human remains, the dilemma is the private interests of a family to recover the body against the public interest that a body can offer as a source of knowledge: heritage hold by private owners should be able to be enjoyed by the public. Finally, climate change establishes a controversy between the preservation *in situ* that benefits knowledge sought by archaeologists as stewardships against their visibility of those sites available to humanity if they continue to be preserved *in situ*.

4. Preservation for the future is an established precept, the reason being that we will have more tools that will help to analyse and research the heritage with more developed techniques. However, there will always be the possibility of having better techniques but no shipwrecks will endure forever. In addition, preserving for future generations implies deciding for future generations although it is impossible to know what future generations will want.

5. Nafziger (1999) claims that shipwrecks are unnatural, because they do not belong underwater but at their home ports and intended destinations. Inland, for instance, some churches have been converted into coffee bars. It may not be their primary

and intended use, but circumstances change. These two examples lead us to conclude that it is impossible to protect the entire heritage as their proposed function. It is essential not to be trapped by melancholia and pragmatics and start being flexible. Creating a hierarchy of values will help us to evaluate the importance of the heritage to preserve.

6. The past is a renewable resource since there will always be a past. There will also be a heritage to protect and as time passes, the amount of heritage will multiply and we will be talking of “accumulation” of heritage (Harrison, 2013). We have to learn how to lose part of the heritage since it may mean that (1) the essential heritage that should be preserved is lost for being too abundant (2) heritage will stop being appreciated for being “especial” and will start being “normal”.

5.3. Specific proposals

Four solutions have been proposed to each one of the ethical controversies raised in this dissertation:

I. Valorisation: violin of the *Titanic*. After the discussion on valorisation of the violin, the chapter has concluded that the violin for the different values that has been bestowed with (even an economic one or a prosthetic one) is now considered part of the heritage. However, it is in private hands and it cannot be enjoyed by all. In order to comply with this requirement, this study proposes two alternatives, which can be applied to any object of heritage under the same circumstances:

(1) If the violin is considered by government, heritage managers or visitors of being of public property, it has to be recognised according to its importance and not by the time it has been under water. It can also be

recognised as an object of the collection of the *Titanic* and as a consequence it cannot be separated from the main collection. It can also be transformed for being played highlighting its value as a sound window, as a spreader of emotions. As a consequence, if one of this valorisations is important enough for establishing the violin as public property, the government, under the right of expropriation, can compulsory buy the violin from the private owner and make it accessible for visitors. However, if this option seems excessive, the government can also apply “the right of first refusal” or “the right of repurchase” which would make it as the first and preferable buyer in case of a new sale or it could have retrospective character and repeat the auction, with the government as first buyer.

(2) If it is established that the violin is considered private property because it is the economic value the one that is paramount on its valorisation, the violin can still be of public benefit if a condition of visits for the public is established. In this sense, the private owner would also benefit from this option, because the violin, as heritage, could be included on one of the lists of world heritage and would gain prestige. As a consequence, in a future sale, the violin would be revaluated as an object of world heritage and its economic value would increase.

II. Use: ancient lead. The case of the use of ancient lead for experiments in particle physics opens a debate in which uses should be allowed in detriment to the underwater cultural heritage. This chapter has proposed establishing a protocol of interventions, which obviously means that this study agrees with the utilisation of underwater cultural heritage for uses other than archaeological. Several reasons

support this choice. For instance, that the use of underwater cultural heritage for experiments on dark matter are established under an agreement with archaeologists and do not contravene the 2001 UNESCO Convention except in the integrity of material, keeping collections together and trading of objects. Preservation *in situ*, although it is not complied with, the phrasing of the article “considered as the first option”, does not prohibit its recovery. However, this study also establishes that although some uses can be allowed, impact assessments of these activities should be compulsory. First, the uses of this underwater cultural heritage will need to be carefully weighted. They have to benefit humanity, they have to disclose all information on experiments and they have to be able to demonstrate that no other material can replace the underwater cultural heritage. In addition, only agreements with archaeologists in order to handle the material under scientific standards should be provided. As a consequence, the protocol, although not preventing the loss of material, would guarantee that the information from that lead would not be lost.

III. Management: watery graves. The study has tried to highlight two main controversies arising from the management of human remains on underwater cultural heritage. The first one is the existence of those shipwrecks which are a scenario of human tragedies but do not contain human remains. The second one is the consideration of those scenarios under different circumstances such as being of scientific or educational interest, having surviving relatives or communities or being shipwrecks with passengers that are not included on the “standard” countries’ ownership. As a consequence, this study has proposed a new categorisation of these scenarios under three main labels: intangible heritage, absent heritage and invisible heritage.

- Under the first treatment, human remains would be considered as “venerated sites” which are part of a community cultural space and as a consequence would be considered intangible cultural heritage. These shipwrecks would be protected, as a consequence under the *2003 Convention for the Safeguarding of the Intangible Cultural Heritage*.

The other two treatments of the shipwrecks as absent and invisible heritage, however, would not be protected under the Convention for being new proposed categories of heritage. However, they could be considered as new annexes to any of the other UNESCO conventions.

- The treatment of human remains on underwater cultural heritage as “invisible heritage” would imply the consideration of shipwrecks fields as cemeteries of those human remains that were once on there but have now disappeared. The shipwreck would then leave their footprint, “the human remains”, that need to be respected.
- A last option has been considered by this study, which is the treatment of the human remains as “absent heritage” that would imply that the shipwrecks are seen as a “frame” of what is not there anymore. These human remains would be considered “absent presence”. The consequence would be the memorialisation of those shipwrecks as “containers” of sacred remains.

IV. Preservation: climate change. The main point of concern concluded by this study has been the specification of the different heritage that composes the seas: the differentiation between natural and cultural heritage prejudices on the fight against the effects of climate change. The chapter, as a consequence, proposes the inclusion

of underwater cultural heritage on natural heritage preservation policies. This measure will offer a more specific protection to underwater cultural heritage which is affected by climate change in a more similar way to coral reefs; for instance than to heritage in land archaeology. Therefore, underwater cultural heritage would be protected under environmental standards, considering the oceans and shipwrecks as indivisible. This step would allow joining forces against the effects of climate change. Preservation *in situ*, as a consequence, could still be considered as an option since it has already been ruled out by this study that all shipwrecks can, for instance, be recovered. The options that have already been offered for the accessibility of underwater cultural heritage (such as underwater submarine parks or underwater museums) would then be a reality but not a threat for future climate change.

5.4. General proposals

Underwater cultural heritage is, as said, a vast resource (nearly 10,000 only vessels) and as a consequence we need to be selective for its protection. The decision has to be based on technical, political and legal decisions. For some authors (Aznar-Gómez, 2004), however, underwater heritage++ is still an abandoned form of heritage which is neglected and forgotten.

This work has tried to demonstrate that underwater cultural heritage is also a threatened heritage, both socially and legally. In this sense, it is worth remembering that although international legal instruments have been already devoted to the protection of underwater cultural heritage, international agreements are binding only upon governments but not on an individual or group if they are not incorporated into national law (Carman,

2003). The states need to remember this premise even if they have ratified any international legal instrument.

The definition of underwater cultural heritage by the limit of 100 years under the 2001 UNESCO Convention has been concluded by this dissertation as one of the main damaging articles to the four case studies that this work has presented. Only a definition of underwater cultural heritage by significance through award of values guarantees that the main pieces of heritage will be preserved for the future of humanity.

In view of these results, this study would like to propose two alternatives to the consideration of a shipwreck, an object or a site as part of underwater cultural heritage:

1. Seeing it in a bigger picture

A first solution for the definition of underwater cultural heritage would be its classification into four categories based on physical mobility: underwater cultural heritage can be both movable *and* immovable, but it is also an archaeological field as well as an object immersed in the sea.

- The vessels, the anchors or even whole shipwrecks must be considered as movable goods; after all, they can be and are moved, as the *Mary Rose* was.
- However, they could also be considered as an immovable object, especially if the hull cannot be lifted.
- In addition, the physical context of these items is crucial to their understanding (Bator, 1981: 65) and as a consequence underwater cultural heritage can also be considered as an archaeological field.

- Finally, for being an object that ultimately belongs to the sea (since oceans are the last place of destination of shipwrecks) they can also be considered as objects in the sea.

The result of this classification is its protection from different legislation other than the 2001 UNESCO Convention. The UNESCO Conventions have to be combined in order to be suitable for all range of underwater cultural heritage sites. In this regard, it is worth highlighting the six main Conventions that stand as guidelines on the protection of heritage that could be applied to underwater cultural heritage, namely from the most recent one:

-2005 Convention on the Protection and Promotion of the Diversity of Cultural Expressions

-2003 Convention for the Safeguarding of the Intangible Cultural Heritage

-2001 UNESCO Convention on the Protection of the Underwater Cultural Heritage

-1972 Convention concerning the Protection of the World Cultural and Natural Heritage

-1970 Convention on the Means of Prohibiting and Preventing the Illicit Import, Export and Transfer of Ownership of Cultural Property

-1954 Convention for the Protection of Cultural Property in the Event of Armed Conflict with Regulations or the Execution of the Convention

None of them have a sole article excluding other legal instruments for protection of the heritage, and, as a consequence, can be combined. International

regulations also allow the placing of underwater cultural heritage in other heritage contexts, establishing comparisons and choosing the most appropriated situation for each circumstance. At the end of the day, as the study has tried to demonstrate, some of the issues that have arisen are related to the definition and classification that the legislation applies to each heritage. However, one of the main lessons learned from this dissertation is that the law means what it says, and, what is more important, it does not mean what it does not say. Therefore, applying the legal instruments to underwater cultural heritage has to be managed in conformity with what the law *says* in order to avoid second interpretations and manipulations that can be as damaging to the heritage as the lack of legislation. This can only be done under the expertise of legal experts.

2. Seeing it as a process of yes or no questions. The second proposal is for consideration of a shipwreck, object or site as underwater cultural heritage according to a questionnaire where at least one of the requirements has to be fulfilled.

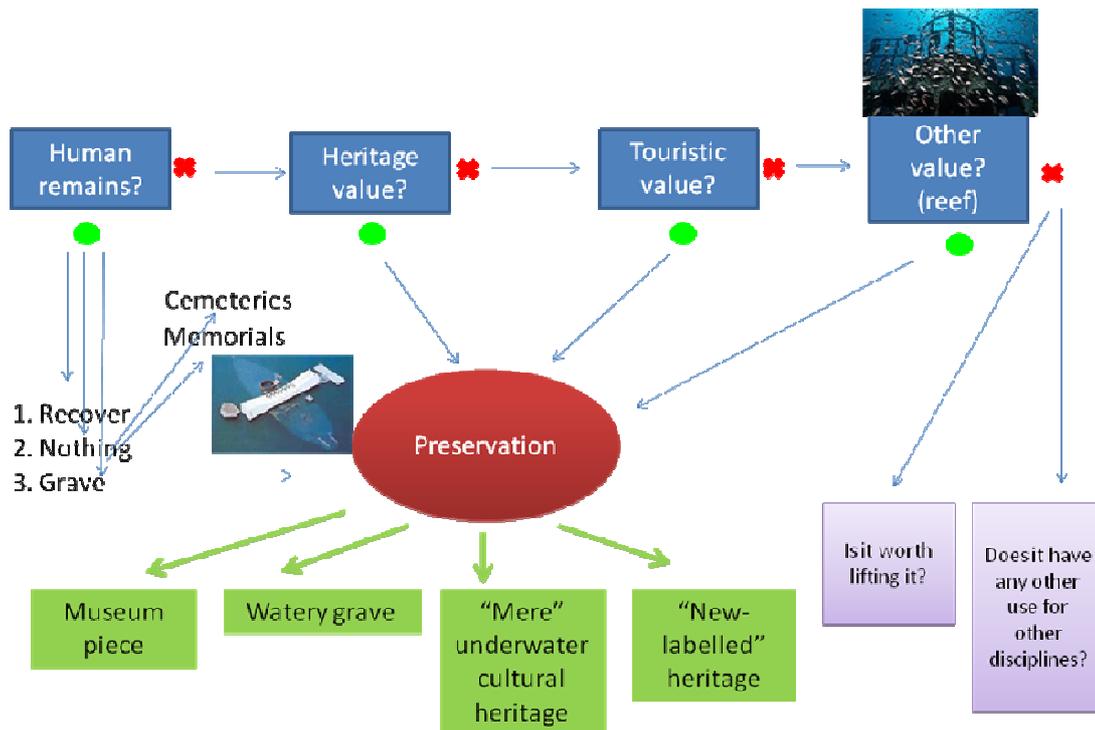


Fig 5.1. Process of consideration of underwater cultural heritage

As Figure 5.1 illustrates, the process would be based on values classification:

2.1. Does it contain human remains? If it does, three options can be contemplated depending on culture or relatives choice: recover them, leaving them or treat the shipwreck as a grave that will require its preservation. In this last option, the shipwreck can be preserved as a cemetery (a mere watery grave) or as a memorial, enhancing its significance for society. However, if human remains are not contained on the shipwreck, a new question should be asked:

2.2. Does it have heritage value? In this category we would include its value as a source of knowledge, as a unique element, as an element with historical, scientific, aesthetic significance or social significance, as an element in unique condition or as an element with interpretative potential. If any of

these questions is answered affirmatively, the shipwreck, site or object will need to be preserved and protected by law. However, if it is not, we will have to answer the next question:

2.3. Does it have touristic value? Maybe the shipwreck, object or site is spectacular and this is why it could attract tourism. Maybe it is known or famous because of the media or the film and has created an interest in society (as in the violin of the *Titanic*). And in these (possible) circumstances, it should be preserved. However, if none of these cases exist and tourism may not be an option for it, we should ask the last question:

2.4. Does it have any other value? For instance, in the case of the shipwrecks, it may have a value as a natural reef that requires its preservation so it does not alter the fauna and the natural equilibrium of the place.

If none of these requirements is accomplished, the shipwreck, object or site should not be considered underwater cultural heritage in order not to fall into an accumulation of heritage which requires being selective. In this regard, if it is a shipwreck that is left outside this consideration for her “insignificance”, questions about her risk to navigation should be asked. If she is a risk, should she be lifted or destroyed? If it is not, it is time to evaluate if the shipwreck, object or site has other uses such as a source for other disciplines (i.e., ancient ingots). If that is the case, heritage makers need to learn to let go of the heritage if the right provisions are taken.

However, if any of these requirements are accomplished, the shipwreck, site or object should be preserved. Its preservation will depend on various factors such as policymakers’ decisions, culture or funding but four main outcomes can be explored:

1. A museum piece: inside or outside the water. Its main problem would be the maintenance. It could include monitoring or visiting policies such as scuba diving visits or museum entrance.
2. A watery grave: preserved for respect although it would face a problem of possible disturbance.
3. A “mere” underwater cultural heritage: be treated as such but not practise any option towards it: just preserving its existence.
4. A “new-labelled” heritage: intangible, absent, invisible or as part of natural heritage, new concepts that have to be assimilated and explored.

This study is aware that this second proposal is too ambitious and careful measures should be taken. However, the preservation of underwater cultural heritage needs a proactive point of view, opening new possibilities and risk in order not to fall into a spiral of accumulation of heritage that will de-evaluate the one that really matters. In addition, this is a solution that would remove from the legislation its power of decision on definition of underwater cultural heritage so it could carry out its true function: protection of what it has already defined as underwater cultural heritage.

Chapter 6. The preservation of the shipwreck: Conclusions

“Immediate [...] problems are frequently linked with much larger ones” (Colwell-Chanthaphonh *et al.*, 2008: 45).

The study has outlined the procedures related to the formation, management and preservation of cultural heritage and has examined closely four cases in which these issues have arisen. It has also considered the extent to which existent legislations are adequate to address any concerns regarding these controversies.

The work concludes that although the law is a key mechanism for the protection of underwater cultural heritage that maintains accepted principles and ethics, the objective that the law targets (treasure hunters) is a relative minor risk compared with the legal threats that the law obviates. In addition, legal mechanisms fail to legislate on new values because the drafting process is slower than the breakthroughs in the field of cultural heritage studies. While the white and black matters are well defined and protected, the grey areas that the law does not specifically cover can be interpreted as leading to a loss of underwater cultural heritage. As a consequence, legislation should serve as a guideline on the protection instead of being a decisive instrument.

6.1. Explicit answers to the dissertation’s research questions

Table 6.1. sums up the three research questions set out in the introduction to this dissertation, the methodology used to analyse those research questions and the conclusions reached by this study.

Research question	Methodology	Conclusions
Objective 1: To examine ethical dilemmas challenging the main management pillars that protect underwater cultural heritage		
<p>1. Which ones are the pillars where the protection of underwater cultural heritage stands on?</p>	<p>This research question has been analysed through literature review on cultural heritage management, analysis of the main legislative instruments and comparison between the conventions that protects different kinds of heritage</p>	<p>Valorisation Use Management Preservation</p>
<p>2. Are there case studies that challenge those pillars?</p>	<p>In order to find case studies that challenge those pillars, it has been necessary to search newspapers and journals of any discipline that include some kind of underwater cultural heritage in their investigations, analyse the literature review on the topics, exploring sunken ships that brought unexplored ethical concerns and reading the archaeological reports of those finds</p>	<p>There are more than the four cases studies presented in this dissertation. However, these four have been chosen for their representativeness. Ethical dilemmas on preservation of the underwater cultural heritage are common but answers to solve them, rare</p>
Objective 2: To identify if the current international legislation (and some national legislation) solves these controversies		
<p>3. Are legislations the driving forces that manipulate the process and define the heritage?</p>	<p>This question could only be answered by analysing the texts of the 2001 UNESCO Convention and the 1982 UNCLOS Convention. However, other UNESCO Conventions, other international regulations and national laws had to be explored</p>	<p>The 2001 UNESCO Convention is the main driving force on deciding what is heritage and what needs to be preserved. The age consideration protects “repeated” heritage and excludes heritage that can be potentially important to preserve.</p>

Table 6.1. Conclusions on the research questions of this study

Objective 1: To examine ethical dilemmas challenging the main management pillars that protect underwater cultural heritage.

Research question 1: Which ones are the pillars where the protection of underwater cultural heritage stands on?

1. Valorisation: the same heritage object can have different values depending on the user. However, valorisation is also a changing variable depending on the period, the culture, the visitor or the manager (Herreman, 2006). For archaeologists, the main value that a heritage object has is the value of offering historical information (Renfrew and Bahn, 2008). However, other values are also licit and should be considered. How the object will be valued will decide whether it is worth being protected.

2. Use: before becoming cultural heritage that needed to be protected or analysed, some objects were items of collectors (Bator, 1981). However, a change in the mentality converted archaeologists into stewards of the heritage who have bestowed those objects with the value of “knowledge” (Okamura, 2010). As Bator (1981) claimed, policymakers have fought against those old enemies (collectors) that have been considered “illicit” users. However, unexpected legal uses of the heritage by other actors have arisen in the last years. Those actors will also use underwater cultural heritage for the benefit of all mankind. The dilemma is which use to choose: knowledge of the past or knowledge for the future.

3. Management: it has been commonly established that cultural heritage has to be managed to be preserved for the benefit of all (Smith, 2005). As the author defended, it has to be exhibited, analysed and the results have to be

published. Archaeologists become stewards of the heritage and drafting law becomes the instrument for this management.

4. Preservation: Experts in the field have considered preservation *in situ* as the first option to preserve archaeological objects underwater since the covering mud seals them (Manders, 2003). The recovery of those objects should only be carried out by archaeological methods and under specialists' supervision for two main reasons: its context offers information on the object and an inadequate recovery can cause irreparable damages to the object (Smith and Couper, 2003).

Research question 2: Are there case studies that challenge those pillars?

1. Valorisation: the violin of the *Titanic*. This example has allowed us to examine how an object of normal use has been sold for such an economic value, an example that can be extrapolated to other normal use items such as plates, clothes or toys. The question is, in which moment does the object become heritage: in the moment of the vessel sinking, in the discovery of the shipwreck, in the recovery of some of the objects of the shipwreck, in the exhibition, when James's Cameron film reached its popularity or when the violin was sold in an auction house? Through each one of these steps there has been a process of valorisation and re-valorisation of the violin.

2. Use: ancient lead for particle physics experiments. A particle physics laboratory reached an agreement with a museum in order to receive ancient lead ingots coming from a ship that sank more than 2000 years ago (Nosengo, 2010). The case opened the dilemma of the destruction of underwater cultural heritage for uses other than archaeological but also

warns of its appreciation in other experiments of other branches, such as microelectronics and medicine.

3. Management: human remains contained in underwater cultural heritage, what have been called “watery graves” (Gibbs, 2005). Including human remains in the definition of underwater cultural heritage implies that every single article on the 2001 UNESCO Convention will be applied to them. However, applying this management to every single concept considered underwater cultural heritage, such as human remains, brings up ethical considerations.

4. Preservation: climate change is a phenomenon that will bring alterations to the current state of the underwater cultural heritage. This material, very sensitive to changes in its environment, could be damaged or destroyed. Although alternatives to preservation *in situ* have already been explored (Caple, 2008), climate change may bring urgency to the decisions on what to preserve.

In addition, all of the cases have challenged at some point the definition of what “underwater cultural heritage” is. The violin of the *Titanic* challenges the idea of definition by a time limit, that in the case of the 2001 UNESCO Convention is 100 years (Article 1). The item, attached to a site that it is considered underwater cultural heritage (the shipwreck) is not preserved for not accomplishing the time limit requirement. Ancient lead bricks, on the other hand, under water more than 100 years are considered underwater cultural heritage under the Convention. The dilemma is if each one of the 1000 bricks which are of exact characteristics are of more worth being underwater cultural heritage than the violin that has been

considered the symbol of the sunken *Titanic*. Human remains also challenge the definition since they are considered to be underwater cultural heritage under the Convention. The same precepts that are applied to shipwrecks or sunken cities (e.g., preservation for the benefit of all, public exhibition or international cooperation) should also be applied to them. However, the relatives or living descendants of the human remains may not agree with this inclusion of their relatives as “underwater cultural heritage”. Lastly, climate change will destroy but will also generate some underwater cultural heritage. Cities and islands will become underwater (Rahmstorf and Richardson, 2009) but they will not be protected after being underwater for more than 100 years. The time definition is, again, playing against the preservation of the heritage.

Objective 2: To identify if the current international legislation (and some national legislation) solves these controversies.

Research question 3: Are legislations the driving forces that manipulate the process and define the heritage?

Underwater cultural heritage is considered as such and is protected by the 2001 UNESCO Convention because it has been under water for more than 100 years. As a consequence, some important shipwrecks, such as the *USS Arizona (1941)*, whose tragedy is an important part on the World War II, are not considered underwater cultural heritage and are not protected under the umbrella of the 2001 UNESCO Convention because they have not been under water more than 100 years. As a consequence, the law is the one deciding when the shipwreck is important enough to be protected and deciding what is worth to be called “underwater cultural heritage”.

The methodological approach that was set out on Chapter 3 has helped to answer the research questions. The empirical approach allowed me to observe the four case studies that challenged the mainstays on cultural heritage management. Through the study of past and current bibliography, these mainstays were formulated and understood and the case studies were analysed. The legal approach helped me to examine the solutions offered and forgotten by the legal instruments in order to find the legal vacuums that needed to be filled. This aim was fulfilled through a comparative analysis with other disciplines that offered me solutions for resolving these issues that were proven to be so damaging for the protection of underwater cultural heritage in particular and the protection of cultural heritage in general.

6.2. Contributions from this study

Non-legal studies in cultural heritage studies are not trained to discern the contradictions of legal instruments. However, this dissertation, given the author's background, has been able to discuss those contradictions in relation to cultural heritage matters. International law cannot be ignored on cultural heritage studies but nor can it be the deciding instrument. This study engages with the law but only as a mean to pursue the goal of preservation on what has already being called "heritage". Law can only be the expressions of the already defined-values in social rules and, if managed adequately, law can also impact discourses about heritage in the political arenas.

This research and findings open a new window for discussion. Establishing the bases on the four main pillars that have been discussed will guide future decisions on other cases. Kingsley (2011: 225) claims that time will prove that the 2001 UNESCO Convention is restricted in scope and not the "Holy Grail that heritage bodies believe". If this dissertation is right, new actions to stop the damaging effects on underwater cultural

heritage by an “out-to-date” legislation should be taken. The 2001 UNESCO Convention benefits of being a non-funded Convention with an Annex. Updating this Annex should be seen as a real possibility.

The valorisation of cultural heritage was another issue approached by this study. The initial table of values suggested by the experts in the field (Table 2.1.) offers now a new approach (Table 6.2.) based not only on the bibliography but also on the information obtained after analysing the suggestion of four case studies. This table shows now an own interpretation of values that hopes to offer a new vision on valorisation of heritage exemplified in the four case studies of this dissertation:

CASE STUDIES	THE VIOLIN OF THE <i>TITANIC</i>	WATERY GRAVES	ANCIENT LEAD	CLIMATE CHANGE
LIPE (1984)	Associative-symbolic	Aesthetic	Economic	Informational
DARVIL (1995)	Option	Existence	Use	Academic (CARVER, 1996)
FIRTH (1995)	Non-archaeological values			Archaeological values
CARMAN (2005b)	Social school of value		Accounting school of value	Economic school of value
KAORU and HOAGLAND (1994)	Non-use value		Use value	
DELGADO (1988)	Cultural	Aesthetic	Romantic	Use value
Own interpretation of values	Identification value: with the material	Presence and absence value: it is or it has been just there		Beneficial value: gives a benefit material or immaterial
				Data value: source of information

Table 6.2. Classification and incorporation of values based in Table 2.1. Information compiled by author

To sum up, this study has identified four values that in our opinion would summarize all kind of values applied especially to underwater cultural heritage: a *beneficial value* (values that gives a benefit, material or immaterial such as commercial, market, touristic, social, recreational, creative arts, research in other sciences, development, education, of political discourse or of ecological value), an *identification value* of identity with the heritage (symbolic or any other kind) where we would include a value acquired by faith or by prosthetic memory, a *material value* (as a source of data, historical or of knowledge) and a *surviving value* where the heritage is just as an archaeological remain that does not offer anything but it is there for future generations.

In this regard, it is useful to apply this classification and organization to the four case studies that this dissertation has explored:

- Violin of the *Titanic*: identification value. A normal object has become a heritage object because the visitor has identified with the tragedy and has awarded it with a value. However, as it will be explained, this value will be a “prosthetic value” acquired through a prosthetic memory.
- Ancient lead: beneficial value. The issue of underwater cultural heritage and its utilization for experimental purposes would have as a driven value the “beneficial value”. The use of this heritage for non archaeological purposes that are legal need to be considered as a legitimate value. Archaeology evolves and also its applications do.
- Human remains: presence and absence values. The management of human remains will be driven by this value because human remains are valued just because it is

assumed they are victims of a tragedy, they remain under water and they can be tangible or intangible but they are “there”.

- Climate change: data value. The principle of “preservation *in situ*” is based mainly on the importance on the context on getting more information and as a consequence is driven by a value of acquiring data. However, due to climate change, this valorization is in risk.

However it seems that not only will the area of underwater cultural heritage management benefit from this dissertation but also the field of cultural heritage in general will have a different insight into old precepts. The benefit of this approach is that once the delicate questions have been exposed it will be easier to find solutions. As a consequence, this study has suggested four proposals that will benefit the heritage studies field: the private property of cultural heritage but for the benefit of all, its use for benefits other than archaeological if regulated, the protection of human remains on cultural heritage under other more respectful labels and an open vision of cultural heritage as part of the oceans to be protected under the same policies. These solutions can be applied to other ethical controversies that are certain to arise on the management of cultural heritage.

6.3. Limitations

This dissertation has encountered some problems. The main one has been the difficulty on narrowing the topic. Valorisation of the heritage has been well discussed in the bibliography for years and authors have developed their theories extensively. The same difficulty has been found for narrowing the topics of heritage and law, and heritage and ethics. However, it has been possible to discover that for the most part, the discussions were on old topics and few authors raised new concerns or future concerns. Underwater

cultural heritage policymakers seem to be anchored around the same old discussions of land heritage, maybe because the discipline is still not well developed and the bases are still not consolidated. Researching and excavating the shipwreck as well as making efforts so treasure hunters do not get close to those shipwrecks seem to be the main concerns of underwater archaeologists, as indicated in the bibliography. However, they seem not to be aware of major threats that can destroy the heritage, such as climate change or a poor legislation.

Another major problem has been encountered and it is the continuing comparison with land archaeology. It seems that the discipline has always been seen from a land point of view and as a consequence, some precepts that have been tried have failed; for instance, the management of human remains or the preservation *in situ* rule adopted from land archaeology which do not work that well on underwater archaeology. On the contrary, other topics well solved in land archaeology have not been explored in underwater archaeology; for instance, no attention has been paid to underwater cultural heritage as a natural resource, while in land archaeology this option has already been explored (although it has not still been seen as a real option).

A last issue problem faced by this dissertation is related to the analysis of the bibliography on law protecting underwater cultural heritage. The main obstacle to the legal preservation of this heritage is the compartmentalisation of the legislation for each kind of heritage and a lack of the use of these legislations combined. Almost none of the commentators on underwater cultural heritage mention other conventions such as those alluding to intangible heritage or cultural and natural heritage as a tandem.

6.4. Recommendations for future research

There are some areas of research in the topic that have been briefly explored but that are necessary to develop: other ethical dilemmas, such as the changes of “ownership” of the countries, the birth of new cultural heritage or the dangers carried out by development works are worth being addressed in the future. They are topics that will have an impact on the preservation of cultural heritage sooner or later. As ,already said, posing new cases is fundamental but complex and controversial (Tarlow, 2006). However, it is necessary to plan for the worst and hope for the best.

This work has addressed when cultural heritage becomes cultural heritage. However, it has not addressed when it ceased to be so. Researches into this dilemma deserve other dissertation.

The line that future research in the area should pursue is, as a consequence, directed to look for new solutions for that heritage that matters because of its “valorisation” and more importantly, letting go of that heritage which is not of much importance. It is time to step forward and accept that heritage may have other values for other people.

6.5. Final findings

This dissertation has been written in order to provoke some discussion on values, significance of heritage and its legal protection. Three last considerations want to be highlighted:

1. One of the most striking conclusions that has been determined is that the economic value in heritage only exists when and if other values have been bestowed. It is the process of becoming heritage that makes it valuable for the profit

market. As a consequence, it is necessary to understand that the economic value of an object of heritage exists because the heritage has been valued as such. However, it is an intrinsic value of heritage that it can be, depending on the steward, be prioritised or not.

2. In addition, it has been resolved that the bibliography in the field fills their pages on what to preserve and why it is so important to preserve. However, the academic field has barely dared to talk about what not to preserve and why it is not worth protecting. Setting the precedents of neglecting some heritage will avoid an accumulation of heritage and the heritage that is decided to be preserved after it is bestowed with value will be more appreciated. It might be that a solution in this regard may be the comparison of different objects in order to organise them into a hierarchy according to its importance.

3. It is necessary to address new questions: underwater archaeology is still work in progress. Nevertheless, this work in progress demands that each technical dilemma is looked at from the point of view of the ethical debate. Decisions of protection of some newer wrecks can be decided on a case-by-case basis as some authors suggest (Boesten, 2002). However, and even if the topics are regulated on a case-by-case basis, there is still a need of establishing certain rules and criteria and accordingly, the legal texts will be updated. The legal instrument to protect the underwater cultural heritage should take the risk, present the dilemmas to the political agendas and establish solutions.

The journey undertaken by our ship *Heritage* ends here. She has become a shipwreck. For many this may mean a misfortune but for us, a sunken ship is a new opportunity to manage and protect underwater cultural heritage for the benefit of mankind.

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