

## 18 April 2011 – International Day for Monuments and Sites The Cultural Heritage of Water

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In response to a proposal by ICOMOS, 18 April was designated as the International Day for Monuments and Sites by UNESCO in 1982. Each year a theme is selected to help focus the celebration and promotion of cultural heritage across the world. The aim is to explore cultural heritage beyond the select group of sites on the World Heritage List to encourage local communities and individuals to consider the importance of cultural heritage to their lives, identities and communities. The theme agreed for 2011 is the 'Cultural Heritage of Water'.

Water is one of the key resources required to sustain life. It has led to the development and generation of significant material culture in the form of items, technology and places. How to obtain it, how to store it, how to harness its power and conserve it has motivated human endeavour in a myriad of ways. It has also been the catalyst for the development of significant cultural practices which have generated intangible cultural heritage values. It has inspired poetry, literature, artistic endeavour such as painting, dance and sculpture. It has informed and inspired the development of philosophies and religious practice. The cultural heritage of water, therefore relates not only to the technology and architecture that humankind has developed to manage, utilise and celebrate its life giving properties but also to those intangible values that have shaped our beliefs and practices.

This essay cannot cover completely the complexity and individuality of humankind's relationship with water. It does however attempt to illustrate this complexity in order to encourage a broad exploration of the heritage of water that goes beyond a mere appreciation of the technology that has been developed to utilise, consume, manage and travel over it and must include consideration of the intangible values associated with water. These intangible values of spirituality, aesthetics, grief and conquest, inspire and give meaning to the range of cultural practices, structures and objects that relate to humanity's relationship with water and which in turn comprise our cultural heritage.

"In exploring the Cultural Heritage of Water, ICOMOS is contributing to an issue of extreme relevance to today's society. Within the cultural heritage places and items associated with the heritage of water are hidden lessons bequeathed by past generations. These are guides that can light our way and answer timely questions relevant to the future of humankind. In the way that it was created by our ancestors, the heritage linked to water offers us important lessons for the sustainable management of this valuable resource. This is relevant to the questions raised by the Scientific Symposium "Heritage: driver of development" to be held in the context of the 17<sup>th</sup> ICOMOS General Assembly in November 2011. It highlights the fact that heritage is a force for development and illustrates, from the perspective of past civilizations, the notion of sustainable development" (comment by Sofia Avgerinou Kolonias, March 2011)

### **Water, Cosmology and Religious Belief**

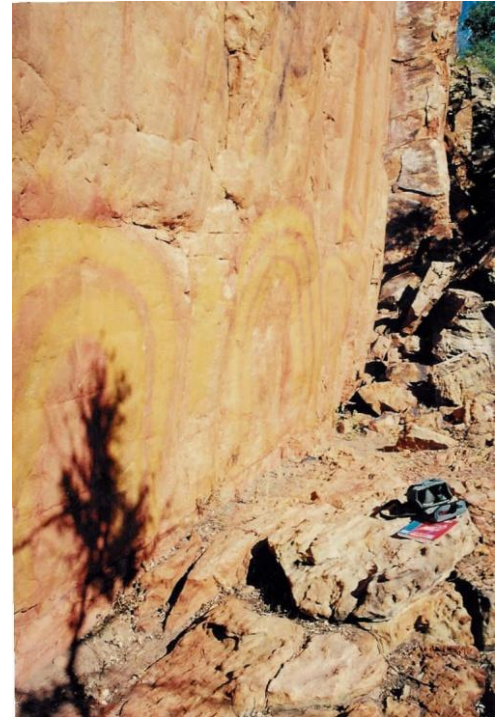
Throughout time water has played a pivotal role in human belief systems. This relationship between 'water' and cosmological beliefs continues to the present day.

For Australian Aborigines and Torres Strait Islanders, as for many hunter-gatherer societies, water sites (such as springs, wells and waterholes) were and are inextricably connected to life's meaning and as such have powerful cultural associations. Many Aboriginal groups told Dreaming stories about special places, and believed that beings from the Dreamtime such as Budjamalla (the Rainbow Serpent of the Waanyi people) occupied particular lakes and waterholes. These beliefs are sometimes recorded in tangible artworks but are more often embedded in intangible records such as stories and practices e.g. dance, song, stories and ritual.

In ancient Greece, many great sanctuaries were built near rivers and springs such as the Sanctuary of Apollo at Delphi (Cultural World Heritage Site, Greece, <http://whc.unesco.org/en/list/393>), where

the water of the Kastalia spring played an important role in the procedure of prophesying. Also, springs and rivers were considered to be sacred sites, inhabited by deities of water, such as Nymphs and Muses, who were believed to dwell in these natural water landscapes and were worshiped there in outdoor shrines. This cult continued in the Roman era. These outdoor places of worship often acquired a practical function. Architectural constructions (aqueducts, reservoirs, monumental fountains, Nymphaea) were built there supplying water to cities and sanctuaries. An example is the Nymphaeum (2nd century A.D.) of Herodes Atticus at Olympia (Cultural World Heritage Site, Greece, <http://whc.unesco.org/en/list/517>) that provided water to the famous sanctuary where the Olympic Games were held (Hatzi, 2008). Such buildings had a very strong influence in later European and Renaissance Art, when similar monumental fountains were constructed.

“Virtually all societies identify particular 'elements' in the composition of the experienced world and cosmos. The importance of these elements is that they represent the basic substances from which everything is derived and to which everything decays (including humanity). Therefore, elements maintain ontological status and provide a potent symbolic medium of expression.” (Richards 1996:313)



Budjamulla, the rainbow serpent, lives in the lagoons in Budjamulla National Park, Australia, and is depicted in painting on rock shelter walls (Photos: McIntyre-Tamwoy)

Beliefs about the sacredness of water have shaped the way that many cultures use it and this has led to a diversity of practices and technologies (e.g. Lando 1983; Shapiro 1995). Water plays a key role in religious imagery and ritual practice in religions all around the world (for example: Nigeria (Bastian 1997); the Mayan deity Chaac who with his lightning axe, strikes the clouds and produces thunder and rain (Scarborough & Gallop 1991; Scarborough 1998; Ishihara 2008); and the Aztec god of rain, fertility and thunder – Tlaloc (Nuemann 1973). The latter was a beneficent god who gave life and sustenance, but he was also feared for his ability to send hail, thunder and lightning, and for being the lord of the powerful element of water. This dual character acknowledges the powerful and destructive aspects of water in nature.

Poseidon, the Greek god of the sea, rivers, and underground water was one of the most respected and powerful gods of the ancient Greek Pantheon, the patron saint of seafarers and fishermen, but

also the god of earthquakes. His age-old cult goes back to the Mycenaean Period (around 1600-1100 BC), as evidenced by signs of the Greek "Linear B" Script from Knossos and Pylos. Poseidon was worshiped throughout the entire ancient Greek world in great temples, such as the Temple of Poseidon at Sounion, of the 5th c. BC. Poseidon inhabited Mount Olympus and the depths of the sea and with his trident he could give rise to storms and calm the waters. His worship passed into the pantheon of Rome as Neptuneus. There are numerous depictions of Poseidon and his sea kingdom in ancient Greek, Roman, Renaissance and Later European Art (sculpture, vase painting, mosaics, paintings etc) and they constitute a very important element of the cultural heritage of water. (Bremmer, Erskine 2010; Zusanek, 2009; Mylonopoulos, 2010)

Apart from its important role in religion, in ancient Greece water was linked to the development of medical science. The Sanctuary of Asklepios at Epidaurus (World Heritage Site <http://whc.unesco.org/en/list/491>), is the oldest organized health centre, bearing witness to the transition from divine healing to the science of medicine. Since the 16th century BC, the basis for worship was the cathartic and healing capacity of the sacred water source. Later on, water works (reservoirs, aqueducts, fountains, Greek and Roman baths) served the needs of this medical and sacred centre.

Perhaps it is no surprise that three of the major religions in the world - Christianity, Judaism and Islam - all share powerful images of fresh water and emphasize its life sustaining value and its capacity to refresh and rebirth. These religions all originated in a geographic region where water was a valuable resource. In Judaism, ritual washing is intended to restore or maintain a state of ritual purity and its origins can be found in the Torah. There are many important stories pertaining to water from the Old Testament, shared by Judaism and Christianity, such as the miraculous parting of the Red Sea (Exodus 13:17-14:29) and the story of the Great Flood (Genesis 6-8). These stories are also shared with Islam and documented in the Qur'an. The Qur'an records the powerful, albeit frightening, cleansing force of water in the story of Noah and the great flood (Qur'an 11:42-44) and the crossing of the Red Sea (Qur'an 26:60-67).

In Christianity, water is a powerful symbol of rebirth which washes away sin and impurity. Roman Catholics go further, regarding it as having powerful transformative powers of purification when used in the same sacrament of Baptism (Theiler, 2003). There are several references in the New Testament (e.g. Matthew 28:19-20; and John 4:1-42) regarding Jesus Christ's instructions to his disciples. According to the Greek Orthodox Church, every person baptized in sanctified water is then purified from the original sin. All waters are sanctified on the day of the Epiphanies (Theophanies) when the Baptism of Jesus Christ in the waters of the River Jordan took place. Also, Holy Water springs from the rock in places where sacred images were found (Jensen, 2011, McDonnell, Montague, 1994).

Islam ascribes the most sacred qualities to water as a life-giving, sustaining, and purifying resource. It is the origin of all life on earth, the substance from which God created man (Qur'an 25:54). The Qur'an emphasizes its centrality: "We... made from water every living thing"(Qur'an 21:30). Water is the primary element that existed even before the heavens and the earth did: "And it is He who created the heavens and the earth in six days, and his Throne was upon water". (Qur'an 11:7).<sup>1</sup> Paradise in all three of these major religions is always lush and well watered.

In many other religions water or water bodies are also important. For example:

- Shinto is Japan's indigenous religion and is based on the veneration of the *kami* - the innumerable deities believed to inhabit mountains, trees, rocks, springs and other natural phenomenon. Worship of *kamis*, whether public or private, always begins with the all important act of purification with water. Inside the many sacred shrines troughs for ritual washing are placed. Waterfalls are held sacred and standing under them is believed to purify. Waterfalls are also used in *suigyo* (water austerities).
- The significance of water in Zoroastrianism is a combination of its purifying properties and its importance as a fundamental life element. Therefore, while water is used in purification rites and rituals it is sacred itself and so must be kept from being polluted.
- While symbolism and ritual is not central to Buddhism water does feature in Buddhist funerals.

<sup>1</sup> Translations of the Qur'an taken from <http://quran.com/21> (accessed 5th March 2011)



- Water is important in Hinduism for its power to purify. The most notable feature in religious ritual is the division between purity and pollution. Most Hindus practice rituals as part of their daily life and purification by water is a typical component of many religious actions. To Hindus all water is sacred, especially rivers, and there are seven sacred rivers, namely the Ganges, Yamuna, Godavari, Sarasvati, Narmada, Sindhu and Kaveri.



Fragments of a brazier depicting Tlaloc from Stage IVB of the Templo Mayor in Mexico City.  
(Photo Wiki Commons)

### First Nations, Traditional Owners and Water

Lakes and waterways were, and in many cases still are, integral to daily activities, such as drinking, fishing, hunting, swimming, camping and ceremonies. Aborigines built stone weirs and fish traps on many rivers and lakes, and as we have seen water and water bodies have played, and continue to play in some cases, an integral role in belief systems. There are also many examples of traditional and ancient technologies developed to store and utilise water and its resources.

In some areas particular technologies developed around the exploitation of marine food resources e.g. fishing, turtle, dugong, walrus; leading to the development and trade of new technologies and the construction of purpose built structures. On the floodplains of Lake Condah in western Victoria, they constructed an intricate network of stone channels to harvest eels  
(<http://www.environment.gov.au/heritage/places/national/budj-bim/index.html>)

The Willandra Lakes World Heritage Site (<http://whc.unesco.org/en/list/167>) is listed for both its natural and cultural values. It is an extensive cultural landscape with archaeological evidence demonstrating the Aboriginal occupation of this lake system. The fossil remains of a series of lakes and sand formations that date from the Pleistocene can be found in this region, together with

archaeological evidence of human occupation dating from 45–60,000 years ago. It is a unique landmark in the study of human evolution on the Australian continent. Several well-preserved fossils of giant marsupials have also been found here.



Willandra World Heritage Area (Photo: Commonwealth of Australia)

First Nations people throughout the world still maintain many traditions and ceremonies relating to water. Amongst these: the Hopi people (Peck 1980) have stories handed down about the travel of their ancestors over water and have ceremonies related to rain making; the Inuit have developed life styles, technology and subsistence strategies based on their relationship with ice and water in the Arctic; and the Maori of New Zealand have specific rights and practices in relation to rivers and lakes as well as having sacred stories about the long sea crossings of their ancestors.

### **Seascapes and Riverscapes**

Since earliest times, waterways and lakes have been used to define the boundaries of cultural groups. They had a bearing on social organisation and trade routes. The urge to explore the seas has led to the development of a diversity of water craft from the outrigger canoe to the huge ocean-liners of today.

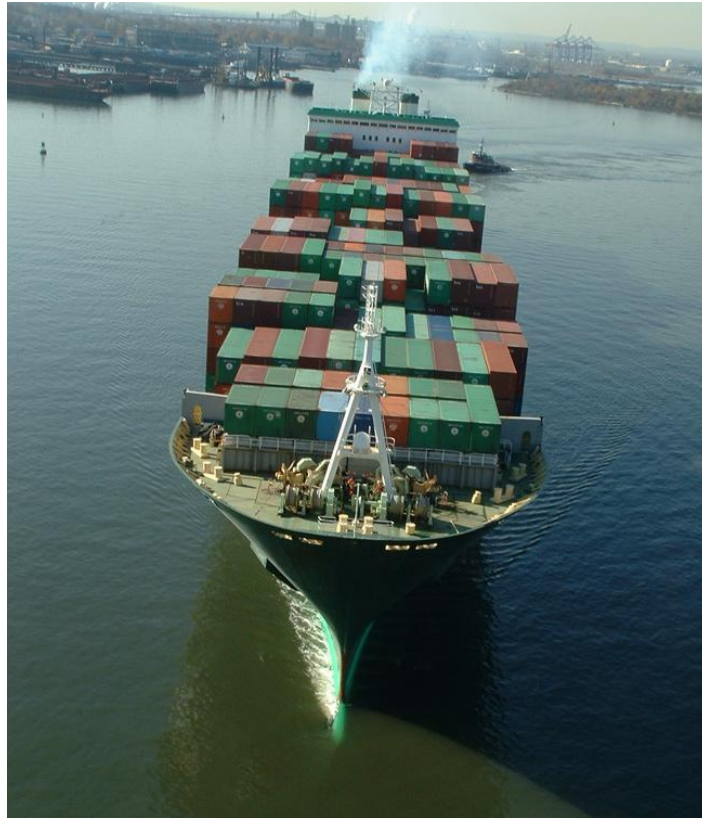
Water was not always seen as a barrier to be conquered. For many small Island states and communities in the Pacific the seas and land form part of the territory of various island groups and the sea provides the resources necessary for survival and the means of accessing land based territory. For example Chuuk, part of the Federated States of Micronesia has as the centre of its territory a barrier reef (Chuuk Lagoon) which is surrounded by several coral atolls and many low lying islands. For many island based peoples - sea territory is known and named in much the same way as land.

Rivers often are the thread linking settlements and indeed facilitating the development of entire civilizations. The Tigris and the Euphrates River system covers an immense area of over 35,000 square kilometres. This area is credited with the emergence of the world's earliest literate, urban civilization around 6,000 years ago. Throughout time many societies have evolved along waterways, along which have flowed cultural material, technologies and practice.

### **Commerce, Communication, Transport and the role of Ports**

Water based transport systems date back tens perhaps hundreds of thousands of years from simple canoes of bundled reeds suitable only for inland waters through to seafaring complex outrigger canoes to sailing ships, today's container ships, luxury liners and yachts and sophisticated naval vessels. Waterways, ports, water transport have been important components of human trade systems throughout time.

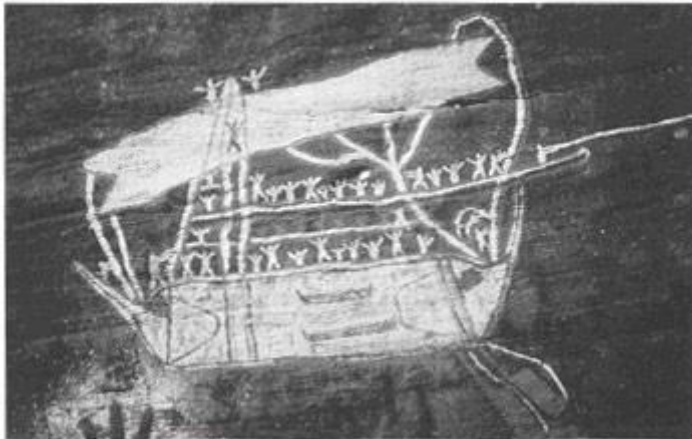




Container cargo ship (Photo courtesy of NOAA)



Australia's Bicentenary- Sydney harbour 1988 (Source: Australian Overseas Information Service)



Macassan prahu with crew. Aboriginal rock painting, Groote Eylandt (Courtesy Northern Territory Museum & Art Gallery)

Sea and river waters have offered since very early times a network of water roads for contacts, colonization and exploration of unknown places. The *Odyssey*, the epic poem of the ancient Greek poet Homer (9th-8th c. BC), constitutes along with the *Iliad*, the first monument of European and Western Literature, and mainly narrates the long journey of the Greek hero Odysseus through unknown seas.

An important element of the heritage linked to water is naval architecture, one of the greater examples of which, with regard to ancient times, is the Greek "Trireme" ship type. Shipwrecks offer important information on the commercial communications, exchanges, water routes and naval architecture. For instance, the underwater site of Dokos (near the Greek island of Hydra) is the most valuable tangible evidence of navigation, sea trade, technology and the economy in the Aegean during the late 3rd millennium BC (<http://www.ienae.gr/EN>).

The development of canoes and rafts were often specifically tailored to the immediate environment of particular societies. In Australia and the Pacific, the development of the outrigger canoe expanded the sea faring range of particular groups dramatically. Using the double out-rigger, Torres Strait Islanders made journeys of up to 400 km from their island homes down the east coast of Australia in often treacherous seas.

Sea trade on a large scale necessitated the development of sophisticated and efficient ports and harbours, and while many of these started out as basic outposts many developed rapidly into vibrant centres of cultural exchange and development. The World Heritage Site of Leptis Magna (Libya, <http://whc.unesco.org/en/list/183>) is described as "a unique artistic realization in the domain of urban planning. It played a major role together with Cyrene in the movement back to antiquity and in the elaboration of the neoclassical aesthetic". The city began as a Phoenician trading port (Lpgy) in the 1<sup>st</sup> millennium BC and was developed by the Romans who constructed a substantial port, with an artificial basin of 102,000 m<sup>2</sup>. This port still exists with its quays, jetties, fortifications, storage areas and temples. "Dug under Nero and organized under Septimius Severus, it is one of the chefs d'oeuvre of Roman technology with its barrage dam and its canal designed to regulate the course of Wadi Lebda, the dangerous torrent that empties into the Mediterranean to the west".

Access to fresh water and/or access to shipping and transport routes has been a major factor in the development and expansions of cities and cultures. The World Heritage Site of Qal'at al-Bahrain – Ancient Harbour and Capital of Dilmun is a wonderful archaeological example. Part of the justification for listing this site illustrates the way in which settlements in strategic coastal locations developed through time. Qal'at al-Bahrain is listed in part because it was ... "an important port city, where people and traditions from different parts of the then known world met, lived and practiced their commercial activities, makes the place a real meeting point of cultures – all reflected in its architecture and development. Being in addition, invaded and occupied for long periods, by most of the great powers and empires, (who left) their cultural traces in different strata of the tell". (see the full justification at <http://whc.unesco.org/en/list/1192> )

The long sea voyages created the need for mapping and for the discovery of mechanisms that could calculate elements such as the date or the position of the stars, which were necessary for the definition of the geographical coordinates. The Antikythera Mechanism (1st c. AD) constitutes the oldest known complex portable scientific instrument. The part that survives today consists of a system of gear wheels of different sizes, bearing inscriptions and rotating around different axes, thus offering information on the position and the periodicity of heavenly bodies (Kean, 1991).



The Antikythera Mechanism (1st c. AD)

It was efficient modes of sea travel that enabled the colonial expansion of European powers into the New World in the 17<sup>th</sup> and 18<sup>th</sup> centuries. While clearly the purpose of many of these trips was to colonise and exploit the resources of newly discovered lands to gain economic and political power in a Euro-centric world; the scientific venture was also important. Many vessels included scientists and naturalists whose role was to document and describe the discoveries made. Most of these curious sea nomads also filled the role of ethnographer providing some of the earliest written records of Indigenous peoples of the so called 'New World'.

Recent history in many parts of the globe has been shaped by this 'colonial endeavour' when the European 'powers' turned their gaze outward and colonized, annexed, or forcibly invaded other continents, and islands such as Africa, the Americas, India and the Pacific. This was all made possible by the advances in ship building which enabled people to travel much greater distances across the seas relatively safely. Gradually, as had happened centuries before in the 'Old World', the face of the coastlines of these continents began to change with the introduction of settlements and ports.

During this time, when naval capacity was a real determinant of political and economic power in Europe, the intensification of shipbuilding and or sea-based defensive systems influenced the development of some ports and towns which developed around the associated industries. One outstanding example of such a place is the World Heritage Site of the naval port town Karlskrona in Sweden ( <http://whc.unesco.org/en/list/871> ), which was constructed in 1680 when Sweden was a major power whose territory included modern Finland, Estonia, Latvia, Skåne, Blekinge and Gotland and parts of northern Germany.





World Heritage Naval Port of Karlskrona (Photo courtesy of the Swedish Government)



Karlskrona (Photo: Ralph Grizzle, courtesy of Avid Cruise)



Captain Cook's sextant c. 1770 (Photo: British National Maritime Museum London, UK)

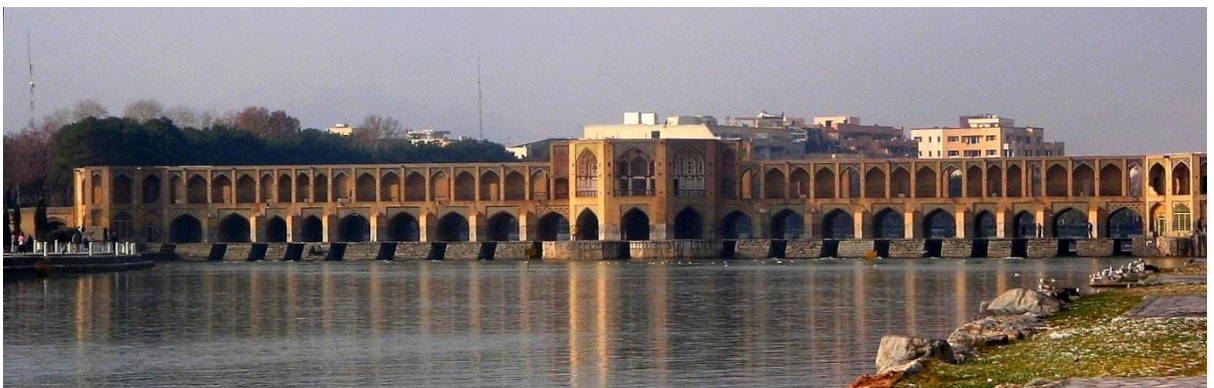
This was a period when the world was 'mapped'. The Portuguese, Dutch and English especially travelled great distances and compiled detailed maps that provide us physical insights into their worldview. Not surprisingly for these people the maps are seascapes with coastlines, freshwater sources and rivers being some of the key features. For many years, the large continents discovered on these voyages were defined only by their coastlines, the mouths of their rivers, their shoals and reefs. The land mass remained a mysterious unknown.

During this time not only were there physical improvements to ships but also great advances in the methods and tools of navigation. During this period an amazing energy was devoted to the accurate mapping of the seas, reef continents of the known world. The sextant was the main tool of the navigator. Developed from the more limited octant in the 1760s, the sextant could be used either to find the height of the Sun above the horizon to determine a ship's latitude, or measure angles between the Moon and fixed stars. The latter was a more difficult observation to do accurately on a moving vessel but, using published tables, allowed a skilled navigator to calculate his longitude as well. Cook used lunar-distance sextant observations made on land to check the accuracy of the experimental chronometers he took on his last two Pacific voyages (Migration Heritage Centre NSW, Australia).

Today, while other forms of transport have to some extent taken over from shipping, it still plays an important role. The advent of container shipping in the 1950's began a rapid revolution in the structure and organisation of ports around the world, changing not only the look of most of the major commercial harbours but also changing the work practices and the social culture of the workers.

### **Bridges**

Human creativity invented many ways to travel across water and boats were not always necessary. There is an amazing variety of bridges that have been designed by architects and engineers through the ages to allow safe passage for people, goods and vehicles. There is a correspondingly wide range of building materials used in the creations of the world's most spectacular bridges. For example, consider the architectural beauty of the Khaju Bridge built in 1667 in Isfahan and the Kintai wooden arched bridge built in 1673 at Iwakuni in Yamaguchi prefecture in Japan. Also, the Mycenaean bridge at Kazarma (around 1300 BC), on the road between the World Heritage Sites of Mycenae and Epidaurus, is one of the oldest bridges in Europe and it demonstrates the continuity of heritage linked to water as it is still used by local residents after 3.300 years.



Kahju Bridge, Isfahan, Iran (Photo: wikicomons - distributed via the GNU Free Documentation License)



Kintai Bridge at Iwakuni, Yamaguchi prefecture, Japan (Photo: wikicommons - distributed via the GNU Free Documentation License)



Forth Rail Bridge, Scotland (Photo: Greg Barbier - distributed via the GNU Free Documentation License)

The Forth cantilever bridge built in 1890 is an industrial marvel. It is one of the world's first and largest steel bridges and held the record for the longest cantilever for 27 years. John Fowler and Benjamin Baker designed the Forth Bridge (1890) to resist wind loads 5.5 times those that toppled the Tay Bridge. A comprehensive overview of significant bridges was carried out in a joint project by ICOMOS and TICCIH (see Delony 1996; and <http://www.international.icomos.org/studies/bridges.htm>)

### Industrial Development

Water has always been a requirement for industrial development. In the past there were the inventions that gave rise to the industrial revolution in Europe such as the water wheel and the steam engine. Particularly important were Savery's engine invented in 1698 (Savery 1827) and Newcomen's engine (1705) used to pump water out of mines. This invention was later improved upon by James Watt who introduced the separate condenser, minimising the waste of energy and radically improving the power, efficiency, and cost-effectiveness of steam engines. Watt developed the concept of horsepower.

Today, water is still essential to many industries. It is required for cooling industrial plants (such as nuclear and coal fired power stations); for fabricating, processing, washing, diluting and cooling in manufacturing and processing industries; and sometimes for transporting material in slurries (such as in some mining operations), generating electricity through technologies such as tidal and hydro power stations, and for a range of industrial processes. Water is probably used at some point in the manufacture of all products. In fact, the industrial consumption of water is increasingly a matter of concern in a world where conservation of water resources is becoming increasingly necessary (Hutsen et al 2004).





Fire pump, Savery system 1698, 18th century reconstitution (Photo: Wikimedia Commons)

Water was the critical resource in the development and expansion of most settlements. The development of an artificial means of storing and distributing water was critical to the notion of material progress, and the image of an advanced and civilised city.

The development of water supplies both shaped, and was shaped by, the development of the colonies into towns, cities, nations. Where water could be easily tapped and stored, settlements flourished. In colonies, such as Australia, the history of water supply has close links with broader historical themes in the nation's development. A successful water supply system represented one of the key objectives of colonial settlement: the triumph of man over the natural environment. In colonial countries, efforts (and failures) to improve the water supply in the city and country areas were caged in language about national identity, the 'British race', progress, and the resourcefulness and stoicism of the Australian settler (Context Pty Ltd 2007).

The engineering constructions designed to control and manage water are often celebrated as a triumph of modern engineering over nature. Over time, these often spectacular places become tourism destinations in themselves. However, increasingly there are many cases that become the focal points for tensions over water rights and access, particularly where these occur at rivers that cross several state /territorial boundaries.

Control of water is an enduring engineering objective and it is not always about storing it or generating power. Hydraulic engineering was a major area of endeavour in the nineteenth century. The Four Lifts on the Canal du Centre and their Environs, La Louvière and Le Roeulx (Hainault) which are listed as World Heritage are an interesting illustration of this.

"The four hydraulic boat-lifts on this short stretch of the historic Canal du Centre are industrial monuments of the highest quality. Together with the canal itself and its associated structures, they constitute a remarkably well-preserved and complete example of a late-19th-century industrial landscape. Of the eight hydraulic boat-lifts built at the end of the 19th and beginning of the 20th century, the only ones in the world which still exist in their original working condition are these four lifts on the Canal du Centre". (<http://whc.unesco.org/en/list/856> ).



Lift No. 2, The four lifts on the Canal du Centre (Photo use licensed under Wikimedia commons)

### War, Conflict and Water

'Water' and waterways have often been contested territories or commodities (Johnston and Donohue 1998; Bennett 1995). This remains the case today when environmental changes and growing populations mean that access to water, and how it is used, is of growing importance (Tushaar Shah 2009). Sources of freshwater, strategic ports and travel routes have been the focus of war and conflict throughout the ages.

Access to waterways, and even to safe drinking water, has at times been controlled or managed for political and or commercial gain (e.g. Aiyer 2007). Competing uses can bring conflict between developers, government and local communities, as in the case of Hydro electric proposals for the Mekong River Valley (Molle et al 2009; Shah 2009); the damming of the Yangtze River; the oil and gas beds of the Mediterranean Sea (Sabel 2011). What once may have been seen as a justifiable resource use to increase economic gain may be condemned by future generations as an environmental disaster, as in the case of the Aral Sea (Glantz & Figueroa 1997).

Throughout time societies have developed political and regulatory processes through which to mediate issues around water access. The complexity and sophistication of these processes is not a modern phenomenon. An example which has stood the test of time and dates back to the 9th to 13<sup>th</sup> centuries are the Irrigators' tribunals of the Spanish Mediterranean coast: the Council of Wise Men of the plain of Murcia and the Water Tribunal of the plain of Valencia. The significance of this site was recognised in 2009 when it was inscribed on the Representative List of the Intangible Cultural Heritage of Humanity.

The irrigators' tribunals of the Spanish Mediterranean coast are traditional law courts for water management that date back to the al-Andalus period. The two main tribunals – the Council of Wise Men of the Plain of Murcia and the Water Tribunal of the Plain of Valencia – are recognized under Spanish law. Inspiring authority and respect, these two courts, whose members are elected democratically, settle disputes orally in a swift, transparent and impartial manner. The Council of Wise Men has seven geographically representative members, and has jurisdiction over a landowners' assembly of 23,313 members. The Water Tribunal comprises eight elected administrators representing a total of 11,691 members from nine communities. In addition to their legal role, the irrigators' tribunals play a key part in the communities of which they are a visible symbol, as apparent from the rites performed when judgments are handed down and the fact that the tribunals often feature in local iconography. They provide cohesion among traditional communities and synergy between occupations (wardens, inspectors, pruners, etc.), contribute to the oral transmission of knowledge derived from centuries-old cultural exchanges, and have their own specialist vocabulary peppered with Arabic borrowings. In short, the courts are long-standing repositories of local and regional identity and are of special significance to local inhabitants. (<http://www.unesco.org/culture/ich/index.php?lg=en&pg=00011&RL=00171>)

In many colonised nations conflicts arose between the Indigenous people and the colonisers. During the period of conflict between settlers and Aborigines in Australia, in the 1830s and 1840s, there were many violent conflicts between Aboriginal people and colonists arising from competition over access to water and food resources (Loos 1982, Barker 2007).

Massacres of Aborigines sometimes occurred at or near sources of water supply. The white perpetrators of massacres often threw the bodies of murdered Aborigines into waterholes or lakes, and at times water sources were deliberately contaminated to poison Aboriginal people. One of the most widely known massacre sites is Myall Creek in NSW, Australia. The justification for listing notes that: “The massacre of approximately 30 Wirrayaraay people at Myall Creek, the subsequent court cases and the hanging of the seven settlers for their role in the massacre was a pivotal moment in the development of the relationship between settlers and Aboriginal people”. (<http://www.environment.gov.au/heritage/places/national/myall-creek/index.html>)

Similar atrocities, often on a larger scale, were perpetrated on Native American groups during the colonisation of the United States (Osborne 2001). In New Zealand, settler appropriation of Maori lands, waterways and fisheries led to several large scale wars, eventually leading to the Treaty of Waitangi.

### Farming and agriculture

There are of course endless examples of the importance of water to societies with advanced agricultural systems such as the Incas (McLean 1986), the Balinese (Lansing & Kremer 1993), the Mayans (Scarborough & Gallopin 1991) and the Toltec and Aztec in the Anahuac Valley of Mexico to name a few.

During the Mycenaean Period of Greek Civilization (14th c. BC), the lake Copais was drained in order to provide fertile land and water for agriculture. 2.000.000 m<sup>3</sup> of earth was moved and cyclopean walls were built to form a system of channels (with a water flow of 100 m<sup>3</sup> / sec in the main channel) that intended to lead river waters into sinks and to the sea through a controlled artificial tunnel of 2.230 m (Iakovidis, S. 2001).

Again we find outstanding examples on the World Heritage List such as the Rice Terraces of the Philippine Cordilleras . “The rice terraces of the Philippines Cordilleras are over 2000 years old. They are living cultural landscapes devoted to the production of one of the world's most important staple crops, rice. The rice terraces are a dramatic testimony to a community's sustainable and primarily communal system of rice production, based on harvesting water from the forest clad mountain tops and creating stone terraces and ponds, a system that has survived for two millennia”. (<http://whc.unesco.org/en/list/722>, see official listing Criterion iii)



Rice Terraces of the Philippine Cordilleras (© UNESCO/Feng Jing)



The prehispanic “chinampas” located in the Xochimilco area in the southern part of the Valley of Mexico represent a local adaptation of agriculture in swamps, which is still practiced today. The roots of this type of agriculture in the Valley of Mexico date back perhaps two thousand years; but reached their maximum expansion during the later half of the Aztec period – circa 1350 to 1521 (Armillas, 1971). At the beginning of the 16<sup>th</sup> Century the “chinampa” area extended over 12,000 hectares and provided food for an estimated 170,000 people. Agriculture in swamps gives rise to a set of traditions and cultural traits linked to water, in this case the “chinampera culture”. Ancient traditions and knowledge have been sustained since prehispanic times by the social organization anchored in the family, (Cline, 1986), (Ignacio Armillas Gil, et.al., “El Paisaje Chinampero: Origenes y Evolución” in “Las Chinampas de Xochimilco”, Alberto Gonzalez Pozo, editor, 2010). Because of the symbiotic relationship between Mexico City and Xochimilco through the centuries both were added to the World Heritage List as a single site in 1987 under criteria: [\(ii\)\(iii\)\(iv\)\(v\)](#); <http://whc.unesco.org/en/list/412>.



(Photos courtesy of Ignacio Armillas Gil)

**Moveable Objects related to Water**

Of course there are many smaller material objects that have been developed through the ages to store, pour, contain, and transport water. Many such items are scattered throughout the world's museum collections, many recovered from archaeological sites. Given the enduring functions intended for these items, there is a great diversity in their age, craftsmanship and distribution. Items such as glass and porcelain jugs have been used to trace ancient trade networks and provide insights into the development of specific technologies. At times such items represent a heightened sense of beauty at times they are more prosaic. Such items retain greatest meaning when in association with their place based context. However, many such items have found their way into museum collections sometimes as objects of art or curiosity.

**Water and Inspiration,**

Water has always had a key place in inspiring artistic endeavour.

The painting of the Fisherman and the painted Frieze with the depiction of a Harbour and Ships, both from the Greek island of Thera (modern Santorini) ca. 1550 BC, constitute two of the oldest European depictions of the life of man near the sea (Doumas,1992).

In the second half of the nineteenth century, seafaring paintings became very popular. "In 1864 the famous wooden Confederate commerce raider the 'Alabama' was sunk by the ironclad Union warship 'Kearsarge' off the coast of France in the English Channel. Although Manet, in Paris at the time, did not witness this celebrated episode in the American Civil War, he was inspired to paint an imaginary view of the event, reconstructing it from the well-publicized accounts he had seen in the press. His depiction of the conflict, The Battle of the U.S.S. 'Kearsarge' and the C.S.S. 'Alabama' was first exhibited in July 1864..." (<http://www.artic.edu/aic/exhibitions/manet/themes.html>)



The Battle of the U.S.S. "Kearsarge" and the C.S.S. "Alabama" by Edouard Manet, 1864  
(Image in Public Domain- source Wikimedia)

Of course, depictions of battles and ships are not the only artistic works relating to water and there are paintings throughout the ages that depict the human relation with water and its relaxing properties. In particular Japanese and oriental art works feature water in its various forms.



'Great Wave'. Japanese art prints or Ukiyo-e.

Beaches are a popular theme, ranging from the restrained modesty of Edouard Manet's 1868 oil on canvas 'On the Beach at Boulogne' to the image that epitomises modern beach culture 'Australian Beach Pattern' by Charles Meere in 1940.

Views of waterfalls, rivers and seas continue to inspire photographers, whether professional or amateur, capturing as they do the beauty or grandeur of nature in a way that calls to the human spirit. The Iguacu National Park spanning the borders of Paraguay, Brazil and Argentina provides an outstanding example that must be one of the most photographed waterfalls in the world.



Iguaçu National Park- Iguacu Falls (Argentina) from the air  
(Photo: Gerdshenkel provided under Creative Commons License)



Water served not only as an inspiration for art but also as an inspiration to philosophers and scientists who turned their thoughts towards the definition and understanding of the very essence of the natural world around us. For example, Thalys, the famous scientist and philosopher of ancient times and one of the Seven Statesmen of Greece (640-546 BC), named water as the key element in his cosmological thesis.

### **Water and Loss**

Water not only gives life, it also can take life away and any overview of the heritage of water must also consider its aspect as a 'heritage of loss'. Where water is scarce, the stress is not only on the physical form but can have a real effect on the human psyche. Anthropological studies have at times shed light on the connection between the physical and the social in relation to the relationship with water. See for example Ennis McMillan who deconstructed the phrase "we are suffering from water" (estamos sufriendo del agua) in a Mexican village (Ennis-McMillan 2001:368).

The history of maritime travel is fraught with tales of loss which are commemorated and revealed in the large number of shipwreck sites scattered through the world's ocean sand seas. Each of these wrecks, whether the result of warfare or acts of nature, is a physical manifestation of loss.

There is a heritage of loss that goes beyond the obvious damage and loss of temples, buildings and other cultural heritage places in the impacts of recent Tsunamis in Aceh, Indonesia. As pointed out by Boen & Jigaysu (2005: 8) "...the all-encompassing nature of culture, in terms of what it implies for the rural communities...[means that]...one of the main challenges...[should be] to reinforce cultural continuity through development opportunities that are afforded through post disaster rehabilitation, so that one does not end up with cultural incompatible solutions, which prove unsustainable in the long run".

### **Significance to Climate Change and environmental change**

The theme of a heritage of loss must extend to some of the ramifications of global climate change (see Henry & Jefferies 2008; McIntye-Tamwoy 2008). There is now no doubt that the activities of humans have had negative impacts on the environment. Some of these impacts are easy to see and accept as there is a visible and direct link between the action and its impact. For example, the arrival of Europeans with their herds of hoofed animals caused irreversible damage to the delicate environments of the Pacific, including Australia. Pastoralists unwittingly destroyed the native pastures, eroded the creek and river banks, and silted up and polluted the chains of waterholes. With aerial photography and satellite imagery techniques available, the impact of silt from agricultural and urban activity on places such as the Great Barrier Reef can be clearly seen.

Access to water, and its management and conservation, will inevitably be of increasing importance to humanity. In some cases research into cultural heritage sites and practices may provide insights that will help develop resilient and sustainable management practices. One example is research into the Balinese water temple network.

"For over a thousand years, generations of Balinese farmers have gradually transformed the landscape of their island, clearing forests, digging irrigation canals, and terracing hillsides to enable themselves and their descendants to grow irrigated rice. Paralleling the physical system of terraces and irrigation works, the Balinese have also constructed intricate networks of shrines and temples dedicated to agricultural deities. Ecological modelling shows that water temple networks can have macroscopic effects on the topography of the adaptive landscape, and may be representative of a class of complex adaptive systems that have evolved to manage agroecosystems." (Lansing & Kremer 1993:97)

The impact of reduced river flows due to upstream damming has been a point of contention for many communities. As storage capacity of dams has grown, local communities downstream have found themselves slowly forced out of existence, resulting in a loss of rural communities and traditions in many countries.

Paradoxically there may be cases where climate change eliminates traditional enmities and conflicts. For example, see the case of New Moore Island in the Bay of Bengal (Bates 2010). The 81 square kilometre island has been the subject of a bitter battle between Bangladesh and India for 35 years but has now been totally submerged due to rising sea levels.

In an effort to prepare for a world of increasing competition for essential resources, such as water, and anticipating losses of species, biodiversity, traditional livelihoods and - in the case of some Pacific Island states –whole countries, philosophers, academics and policy makers are turning to a diverse range of sources searching for successful strategies. In addition to climatology and other hard sciences, researchers are looking at ethnographic and archaeological information, and are studying a range of cultural information sources including religious philosophy and its influence on our cultural practices. So it is perhaps not so incongruous that we find a discussion of Hindu relationships with the earth in an applied science journal such as the *Journal of Hydrologic Engineering* which concludes that:

“The current worldwide ecological crisis has emerged only during the past four decades and its effects have more recently been felt in South Asia. As this region copes with decreasing air quality in its cities and degraded water in various regions, religious thinkers and activists have begun to reflect on how the broader values of Hindu tradition might contribute to fostering greater care for the earth.” (Singh 2008, p 122)

### **Conserving our heritage for future generations**

While most countries around the world have enacted legislation to protect their nation’s cultural heritage, many of the intangible values are still at risk. Increasingly there are heated and bitter debates over the future of our waterways in relation to access, development and conservation. It is now evident that in many parts of the world the cultural heritage places along these waterways are under threat, not only directly by anthropogenic and natural actions but also because the very sustainability of the waterways themselves is at risk.

Many jurisdictions (United States<sup>2</sup>; Victoria<sup>3</sup>, Australia) have in the past two decades enacted initiatives to protect Heritage Rivers. The Canadian government has embarked on a non-legislative strategy with the establishment of the Canadian Heritage River System. This system is driven by voluntary participation, partnership, cooperation and community involvement. The rationale for the CHRS states that “Rivers are the threads that weave together the natural and human elements of Canada.”

Underwater cultural heritage, remains at risk in many parts of the world not just from the natural course of decay of the fabric but also due to looting, often despite localised attempts to protect such sites (see Blake 1996; O’Keefe 1996). In 2001, UNESCO enacted the Convention for the Protection of Underwater Cultural Heritage<sup>4</sup>.

18 April, the International Day for Monuments and Sites, provides the opportunity for communities across the world to think about the cultural heritage associated with water, to celebrate their conservation achievements and to come together to discuss emerging issues and new initiatives to protect our cultural heritage places.

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<sup>2</sup> Executive Order 13061 FEDERAL SUPPORT OF COMMUNITY EFFORTS ALONG AMERICAN HERITAGE RIVERS September 11, 1997

<sup>3</sup> HERITAGE RIVERS ACT 1992 (Victoria)

<sup>4</sup> See <http://www.unesco.org/new/en/unesco/themes/underwater-cultural-heritage/>

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