

THEMATIC REPORTS



Rock Art at Risk

The situation concerning the relative under-representation of rock art properties on the World Heritage List has improved to a considerable extent in recent years. Recent inscriptions of rock art sites have included Chongoni, Malawi (2006), Twyfelfontein, Namibia and Gobustan, Azerbaijan (2007). In addition to these properties, the Ecosystem and Relict Cultural Landscape of Lopé Okanda in Gabon in Africa, with a remarkable collection of some 1,800 rock carvings also was inscribed on the World Heritage List in 2007.

In other positive developments, a number of joint initiatives of the World Heritage Centre, ICOMOS International and ICOMOS's Rock Art Committee (CAR) have focussed on the support and facilitation of the process of selection and nomination of new rock art sites to the World Heritage List:

- The publishing of a World Report on Rock Art in 2004 - The Future of World Rock Art (Bertilsson & McDermott, 2004).
- The creation of a draft Charter on Rock Art that was presented in 2004 and waiting to be finally approved in 2007.
- ICOMOS's Rock Art Survey, Analysis and Action Plan were presented at the World Heritage Durban Meeting in 2005. The report is based on the Inventory of Nomination Dossiers of Rock Art Sites Inscribed on the World Heritage List that was accomplished the same year.
- The launching of a new program of Regional Thematic Studies on Rock Art in co-operation with the World Heritage Centre (ICOMOS 2006).
- The creation of Pre-Nomination Guidelines for applications to the World Heritage List (work in progress).
- A designated focus on Rock Art and the World Heritage List at the Valcamonica Symposium in May 2007, including a special session on Managing Rock Art Sites directed by UNESCO-WHC. The UNESCO session held during the biennial Valcamonica symposium was aimed at the development of a site technical cooperation network in the area of conservation and management of Rock Art World Heritage sites.

The accomplishment of the draft Charter has also been followed by initiatives to undertake Regional Thematic Studies and to formulate Pre-nomination Guidelines as supportive tools to facilitate the process of selecting sites with potential for World Heritage List applications. This concept was originally developed by a group of ICOMOS people, namely Regina Durighello, Gwenaëlle Bourdin, Susan Denyer, Ulf Bertilsson and Jean Clottes. It has been further elaborated in close cooperation with Nuria Sanz of the World Heritage Centre, thanks to whom it was officially presented at the meeting organized by the UNESCO World Heritage Centre in Basse Terre, Guadeloupe in May 2006, with the aim of developing a transnational Rock Art nomination in the region. The report on Latin America and the Caribbean was finalized and published in 2006. It is also available on the internet on the following web address: <http://www.icomos.org/studies/rock-latinamerica.htm>. A second report on the Rock Art of North Africa and the Sahara is already in progress and planned to be published in 2007.

The purpose of the Regional Thematic Study on Latin America and the Caribbean is to give an extensive overview of the region that can be used as a tool in the process of selecting rock art properties for future World Heritage nominations. An important starting point for this work was the International Seminar on Caribbean Archaeology held in Fort-de-Franc in Martinique in 2004 and organized by the UNESCO World Heritage Centre and the Regional Council of Martinique.

Regardless of the slow but steady closing of the gap of missing rock art sites on the World Heritage List there are still far too many rock art sites under threat of damage and destruction around the world. One of these that have been under long-term threat of destruction from industrial exploitation is the Dampier Archipelago in Australia.

Dampier Archipelago and Burrup Peninsula in Western Australia

The Dampier Archipelago and Burrup Peninsula in the Pilbara region of Western Australia contain many outstanding concentrations of rock engravings and associated archaeological occupation sites, some individual types of engravings such as anthropomorphs as well as some stone features. Together, these sites are considered to be of national importance. Extensive shell middens occur at these locations with stratified deposits potentially covering many thousands of years of occupation. Groupings of significant stone arrangements occur together with scatters of flaked stone artefacts, major quarry locations and reduction areas and grinding patches occur in varying degrees of density and diversity.

The engravings on the Dampier Archipelago include finely executed images of a wide range of terrestrial, avian and marine fauna many of which can be identified to genus or species level. Most of the engravings, particularly the images of marine fauna, are only slightly weathered and were produced following the rise of sea levels about 8,000 years ago. There are also many deeply weathered images of terrestrial fauna, particularly kangaroo, which date to the time when the sea was much lower and the coast over 100 km away. The different degrees of weathering of particular types of faunal engravings on the Dampier Archipelago provide an outstanding visual record of the course of Australia's cultural history through the Aboriginal responses to the rise of sea levels at the end of the last Ice Age. There are also many deeply weathered 'Archaic Faces' across the Dampier Archipelago, including some images that are locally unique developments of this theme. 'Archaic faces' are widely distributed through arid Australia and are found in the Calvert Ranges, Western Australia, the Cleland Hills and the Victoria River District in the Northern Territory and in South Australia and Queensland. The 'Archaic Faces' on the Dampier Archipelago demonstrate the long history of contact and shared visual narratives between Aboriginal societies in the Dampier Archipelago and inland arid Australia and are exceptional in the course of Australia's cultural history.

The Pilbara has been described as the richest region of rock engravings in Australia. It is the diversity of representations of the human form, many of which are in dynamic attitudes, and the way in which they are sometimes arranged in complex scenes that makes the Aboriginal engravings in the Pilbara exceptional. An analysis of site locations demonstrates that large concentrations of engravings in the Dampier Archipelago are found on inland plateaus, steep valley inclines bordering watercourses and on rock platforms next to the ocean. The Dampier Archipelago contains particularly high concentrations of rock engravings when compared with other rock art provinces in Australia.

The distribution of engraved motifs across the Dampier Archipelago reflects economic and cultural variability. Previous

work on the Dampier Archipelago provides an outstanding demonstration of the way in which a detailed analysis of archaeological remains (middens, grinding patches, quarries) and associated rock engravings can contribute to an understanding of the cultural and economic meaning of the rock engravings.

Standing stones on the Dampier Archipelago range from single monoliths through to extensive alignments comprising at least three or four hundred standing stones. While some standing stones are associated with increase ceremonies, *thalu*, others were used to mark particular places with scarce resources, such as seasonal rock pools, and were also used to mark sites of traditional significance. Hunting hides and fish traps are also found amongst the extensively modified cultural landscape of the Archipelago. The range of stone features in the Dampier Archipelago is outstanding in a national context for the number of purposes they are known to have served.

The engravings on the Dampier Archipelago include detailed and finely executed examples of water birds, crabs, crayfish, kangaroos, turtles and fish, some of which, because of their detail, can be identified to species level. The finely executed animals identified to species level, the diversity of human forms and the panels of engravings showing scenes of human activity exhibit a high degree of creativity that is spectacular for Australian rock engravings.

The battle for protecting the rock art and archaeological remains at Dampier Archipelago has gone on for many years giving rise to strong professional and popular support. These endeavours have finally resulted in a happy ending; on July 3rd, 2007, two weeks after a letter of intervention was dispatched by CAR, the Minister for the Environment finally announced that the renowned rock art of Western Australia's Dampier Archipelago (including the Burrup Peninsula) had been included in the National Heritage List. The reasons were stated as follows:

"The Archipelago was formed around 8,000 years ago with underlying rocks amongst the oldest on earth, formed in the Archaean period more than 2,400 million years ago. In the rocky red valleys we can begin to understand how Aboriginal people responded to changes in the landscape from the last Ice Age. Rock engravings are thought to number in the hundreds of thousands, possibly millions, with individual sites like Skew Valley in the Southern Burrup containing over 20,000 individual engravings. Images in the Burrup area range from humans including figures engaged in everyday activities such as hunting, to animals like fish, turtles, kangaroos, emus and snakes and species such as the thylacine or 'Tasmanian Tiger' that have been extinct on the mainland of Australia for thousands of years."

A factor of vital importance for the final decision was the two-and-a-half-year assessment of the Dampier Archipelago and Burrup Peninsula performed by the Australian Heritage Council that included extensive research, stakeholder consultation and opportunities for public comment. The declaration has demonstrated how environment and heritage protection can be balanced with economic and industrial development on a site that is home to Australia's second largest tonnage port, supports thousands of jobs and contains in excess of \$35 billion in industrial developments. The decision shows that the Archipelago's significant heritage can co-exist alongside resource-rich industrial areas. The positive implications of this partnership approach are further witnessed by the long-term management of the site through the development of Conservation Agreements and industry contributing many millions of Australian dollars to protect this unique heritage place.

(See also Australia report, p. 30).



Graffiti signatures made with charcoal over the prehistoric rock paintings at Rekeiz Lemgasem (Tifariti) by both Sahrawi (left) and MINURSO (right) (Photo: Joaquim Soler i Sublis)

Damage to rock art sites in Western Sahara

The University of Girona (<http://www.udg.edu/sahara>) has been developing archaeological research in the Frente Polisario-controlled part of the Western Sahara since 1995 in collaboration with the Ministry of Culture of the Sahrawi Republic (the other part of Western Sahara has been occupied by Morocco since 1975). In the course of the study there have been alarming observations of damaging activities at several rock art sites. The damage seems to be concentrated in the most visited places and consists of engraved and painted (with charcoal or spray) graffiti.

Numbers marked with the UN blue sprays. They deface more than ten engraved slabs at Sluguilla Lawash (Photo: Joaquim Soler i Sublis)



Part of the damage seems to stem from the use of the rock-shelters as dwellings during the war of independence. It was clear that the Sahrawi soldiers were responsible for the damage: the graffiti are written in Arabic and the content was related to war, fatherland or God. Although this type of graffiti still occurs the Ministry of Culture is regularly in close contact with the military to reduce such acts and to promote knowledge and respect for the rock-art among the local population. We are now proud to report that the Sahrawi army has become involved in the research and protection work.

Another part of the damage, however, is caused not by the local population but by the international troops deployed in the country. The soldiers of the *Misión Internacional de Naciones Unidas para el Referéndum del Sahara Occidental* (MINURSO) were engaged in September 1991 to monitor the ceasefire and to organize and conduct a referendum which would allow the people of the Western Sahara to decide the Territory's future status. Some of the painted signatures on the rock panels have been thoroughly studied and the result is that they seem to correspond to the list of participating troops published on the website of United Nations: Argentina, Austria, Bangladesh, China, Croatia, Denmark, Egypt, El Salvador, France, Ghana, Greece, Guinea, Honduras, Hungary, Ireland, Italy, Kenya, Malaysia, Mongolia, Nigeria, Pakistan, Poland, Russian Federation, Sri Lanka, Uruguay and Yemen. Researchers working in the area have collected a wide spectrum of examples of damage which have apparently been the members of the MINURSO:

- Troops from the above mentioned countries wrote their names, origin and the date.
- The texts are written in English or an oriental alphabet.
- At the Sluguilla Lawash site, panels with engraved images have been sprayed with blue paint, which is regularly used by the MINURSO's blue helmets in order to mark GPS points and routes. The same blue colour spray is used regularly by the troops all through the Western Sahara.

This damage has been documented on several sites and over a wide time-span. The Ministry of Culture has contacted those responsible for MINURSO but the damaging activities continue. Therefore, the researchers of the University of Girona have decided to share this problem with colleagues and the international agencies which care for the culture and the World Heritage.

This sad example of members of the UN blue helmets forces damaging the Western Saharan rock art obviously stands in sharp contrast to the engaging and demanding words of the past Secretary General of the United Nations, Kofi Annan, about the value of the African rock art and the need for including more sites on the World

Heritage List. Therefore CAR and ICOMOS have to intervene to make these unethical activities to cease.

The World Heritage property of Sierra de San Francisco, Baja California in Mexico

One of the most remarkable rock art sites that have been inscribed on the World Heritage List is that with the marvellous rock paintings at Sierra de San Francisco at Baja California in Mexico. In recent years advanced plans to develop an infrastructure for tourism with motorways, hotels and other facilities typical of modern society have been presented. Such plans are becoming more frequent in connection with World Heritage properties and sometimes they are also needed to improve conditions and to facilitate visitors' access to sites. But at others they may just as well pose threats to the authenticity and significant values that once justified the decision of the World Heritage Committee to inscribe the property on the List. The prehistoric rock art at Sierra de San Francisco is definitely an example of the latter. The incomprehensible aesthetic of the rock art images and the pristine beauty of the serene landscape would be lost if a modern infrastructure were imposed on the property. To avoid such a devastating measure, World Heritage rock art experts and World Heritage rock art site managers, international experts and representatives of the World Heritage advisory bodies met during the session entitled 'Managing Rock Art World Heritage Sites' (22-23 May 2007) directed by Nuria Sanz of the World Heritage Centre at the 22nd Valcamonica International Symposium on Rock Art. These experts sent a motion to the responsible Mexican authorities stating that the proposed plans would threaten the outstanding universal values of the property and therefore must be stopped immediately. The experts highlighted that a monitoring mission to the site may be necessary, depending on the reaction of the State Party to the motion.

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Rock art site at Sluguilla Lawash damaged by blue spray paint (Photo: Joaquim Soler i Sublis)

Neolithic and Bronze Age lakeside settlements in the Alpine region

Threatened archaeological heritage under water and possible protection measures – Examples from Switzerland and Southern Germany

Neolithic and Bronze Age pile dwellings – a circum-Alpine phenomenon

The lakeside settlements in the Alpine region (most of which date from between 4300 and 700 BC) are among the most important examples of archaeological heritage in Europe. The special conditions under water have led to an exceptionally good preservation of the organic materials. Remarkably well preserved timber-built constructions and numerous artefacts made of wood, bark and textiles as well as copious amounts of plant and animal remains constitute the outstanding scientific significance of the pile dwellings. It is these finds categories which have not been preserved in dry-land sites that provide us with a detailed insight into the everyday life and culture of the early agrarian societies around the Alps. It is of great importance to be able to determine precise dates for finds assemblages and the constructional history of villages by means of dendrochronological analyses.

The wetland settlements in lakes, rivers and bogs throughout the foothills of the Alps have been investigated for over 150 years. Numerous artefacts from the pile dwellings were retrieved from lakes and wetland areas using rather primitive methods as far back as the 19th century. While extensive excavations were already carried out in the 1920s, the documentation of the features to modern standards, with few exceptions, was really only introduced after 1970. At the same time, dendrochronological research experienced a breakthrough, although the earliest tentative tree ring dating experiments go back to before 1940.

The pile dwellings can be classified into three types of site, the most numerous being the lakeside settlements, followed by bog settlements, while pile dwelling sites along rivers are only occasionally found. As regards the lakes, one must differentiate between the large lakes in the foothills of the Alps, whose water systems are determined by the Alpine glaciers, and the smaller lakes spread throughout the young moraine landscape. These are often bodies of water largely without effluences, located in the transition area between the mountainous regions and the surrounding fenlands.

Based on the registries of six Alpine countries, approximately 750 sites are today classed as pile dwelling sites. With 450 sites, Switzerland boasts the majority of these. Particularly dense concentrations of settlement sites exist in Western Switzerland (the so-called Three-Lake-Region with Lakes Bièvre, Morat and Neuchâtel), in the Lake Zurich area and at the lakes that form the boundaries between Switzerland and Germany, and Switzerland and France, Lakes Constance and Geneva respectively. These are the two largest inland bodies of water in Central Europe, and, together with the northern foothills of the Alps, they constitute the core area of the pile dwelling phenomenon. This region continues to the north with numerous bog settlements in Upper Swabia, particularly around Lake Federsee, and to the east with sites around the lakes of the Bavarian and Upper Austrian foothills of the Alps. A unique geographical position is represented by the French lakes with sites throughout the Jura Mountains and deep into the Alpine Valleys. There are also similar micro-regions in Northern Italy; however, most of these sites are clustered around the lower area of Lake Garda, the largest of the southern Alpine lakes. The sites located in what is now Slovenia are concentrated in an area limited to the vast bog lands of Ljubljansko Barje.

Early research into pile dwellings – chances and consequences

With the Zurich Antiquarian Society and its President Ferdinand Keller, there was an established network of experts as early as the mid 19th century, suited to its time and with a great interest in the subject of pile dwellings, not least for political reasons. The main result of this early form of “networking” were the twelve “pile dwelling reports”, published between 1854 and 1930, the primary function of which was to highlight the research and “exploitation” of the Swiss lakeside settlements, while also featuring expertise and developments in neighbouring countries. Reports of pile dwellings discovered in the Baltic were discussed, as were ancient accounts of similar edifices in northern Greece. This early research community also produced the first analyses of prehistoric plant remains and animal bones, whose extraordinary potential in terms of archaeo-biological research had been recognised early on.

In most countries, the advances made by the study of these sites were linked with external circumstances, which brought unexpected possibilities and chances, while also, however, often leading to irreparable damage to the archaeological evidence. In Switzerland these were the two Jura waters correction projects, which, from 1872 onwards, lowered the levels of Lakes Neuchâtel, Bièvre and Morat by a good two metres and exposed the prehistoric settlement sites, thereby making them easily accessible. In Upper Swabia, the construction of the first railway line prompted intensive peat cutting in order to fuel steam locomotives. Numerous remains of settlements were subsequently found and some of them were also badly disturbed during peat cutting around Lake Federsee.

Due to their easy accessibility, bog settlements became the subject of great public interest mainly in the early 20th century, not just in Southern Germany but also in Switzerland and Italy. Sites under water remained out of human reach for a long time until Jacques Cousteau's invention of the aqualung made autonomous diving possible. From around 1970, this led to professional archaeologists going under water and carrying out the earliest studies.

The dilemma posed by archaeology as a science – increased insight destroys the sources

Naturally, the past 150 years of research have had an effect on the body of sites. Tentative first steps towards a heritage protection philosophy and an effective “maintenance” of the archaeological sources were only initiated after 1970. Owing to the fact that under water sites were largely inaccessible, one can say that, until the 1950s, systematic destruction – apart from a few exceptions – remained relatively limited. Most of the damage in Switzerland would have been caused by the Jura waters correction projects. This affected three lakes in Western Switzerland (Lakes Neuchâtel, Bièvre and Morat). On the other hand, Canton Berne, for instance, passed the first heritage protection law in an effort to safeguard the

pile dwellings around Lake Bienna as early as 1873. This had been prompted by raids on the lakeside settlements of Lüscherz by local residents, who had started a lucrative business trading in the artefacts. The lakeside settlements of Bodman and Sipplingen on Lake Constance had been exploited in a similar way. Here, a decree issued by the Grand Duchy of Baden put an end to these illicit excavations. However, recent studies have shown that the damage tended to be limited to individual sections and even in settlement sites previously deemed destroyed, the piles driven deep into the lakebed and abundant assemblages of artefacts often still remain intact. The excavators of the 19th century had little interest in many of the finds such as broken vessels and other fragmented implements, and left them behind. The bog settlements were also only affected peripherally, because peat cutting only went to a certain depth and the cultural layers were unsuitable as fuel. Until well into the 1950s, large-scale archaeological research excavations were largely limited to the bog settlements of Upper Swabia and Central Switzerland. In the case of the Upper Swabian Federsee bog, these excavations took place between 1920 and 1937, while the Central Swiss Wauwilermoos fenland was the site of extensive bog excavations mainly during the 1950s. The earliest large intrusions at Lake Constance began in the 1960s, when yacht marinas were dredged and pipes laid in the lakebed. Thanks to a phase of economic boom large studies became possible in Switzerland in the 1970s. Large urban development projects were increasingly realised for the first time in raised lakeshore areas and linear constructions such as motorways and later railway lines ran along the lakeshores straight through vast prehistoric settlement sites. While this prompted the first systematic and high-standard rescue excavations along with immense scientific advancement (since 1972, the costs for national projects such as motorways are funded entirely by the parties responsible), these large-scale developments ultimately led to the total destruction of the archaeological evidence. The large development projects of the 1970s made the archaeological dilemma painfully clear for the first time: increased archaeological insight permanently destroys its own non-reproducible sources.

Pile dwellings under threat – erosion of lakes, drying out of wetland areas

Today, the shores of lakes and rivers in all of the Alpine states are considered to be especially ecologically sensitive and are usually subject to particularly rigorous planning legislation. Many of the lacustrine landscapes have, at this stage, been cared for by substantial lobbying for decades and there are numerous NGOs devoted to the protection of “their” lake (Association pour la Sauvegarde du Léman [Association for the Protection of Lake Geneva], Interessengemeinschaft Bielersee [Friends of Lake Bienna], Internationale Bodenseekommission [International Commission for the Protection of Lake Constance], to name but a few). The danger of uncontrolled construction affecting waters has therefore decreased significantly in the past number of years. The capacities of harbours to accommodate amateur captains have been exhausted and bank reinforcements in the form of walls and dams, often practiced before, have completely gone out of fashion thanks to the introduction of lakeshore renaturation projects. Intrusions into bog land areas have also decreased slightly, due to increased environmental awareness and the protection of wetlands (special legislation in Switzerland, identification of new

natural heritage and fauna-flora-habitat areas according to guidelines stipulated in the Habitats Directive in Germany, 1971 Ramsar Convention on Wetlands). However, old drainage systems and sinking groundwater levels still cause problems. It is also entirely unknown, to what extent global warming will affect wetland areas in the future.

Currently, circum-Alpine pile dwellings around the large lakes are threatened by the aggressive erosion of the shallow water zone, which can extend up to 300 metres into the lake. This erosion is caused by various overriding factors largely beyond our control. Some of these factors are the numerous regulating intrusions into the regime of tributaries and effluences of the waters since the mid 19th century, wave reflection and changes in currents due to bank reinforcements, declining lakeshore vegetation caused by the eutrophication of the lakes, decreased sedimentation due to barrages in the headwaters of the tributaries, and the intensive traffic of motor-driven boats and ships.

The erosion of the shallow water zone usually leads to the large-scale ablation of sediments covering the archaeological layers. In absence of the protecting sediments, the organic components and finds made of wood, bark or plant fibres are destroyed very quickly. Harder artefacts such as pottery may well survive for some years but will also erode rather fast and will lose their archaeological potential, leaving just rounded sherds. After a few decades, all that will be left of the 5000 year old settlements, extraordinarily well preserved up to a short while ago, will be the hardest objects such as stone and bronze artefacts. Compared to the archaeological layers still intact, such eroded layers, having been reduced to “hard ware” only, have lost most of their archaeological evidence. However, compared to “dry-land sites” these sites are still valuable cultural witnesses thanks to the thousands of piles that were driven deep into the lakebed, still possessing a last scientific potential in terms of dendrochronological, and maybe in future also climatological studies.

Completely different processes occur in the dried up areas of small lakes and in bogs. In order to gain more farm land, many of the small bodies of water were “ameliorated” in the past, i.e. lakes without outlets were provided with artificial outlets, the sills of existing outlets were lowered and wetlands were drained using large-scale drainage systems. Ultimately, all these measures have the same effect: Groundwater levels sink and the archaeological sites, preserved in water-saturated conditions for millennia, subsequently dry out. Atmospheric oxygen penetrates the originally waterlogged sediments and micro-organisms commence their destructive work on the organic material. They are extremely efficient: It only takes a few decades for the entire organic material to be totally decayed. To put it simply, they systematically turn valuable archaeological artefacts into simple humus. It goes without saying that this represents a grave loss of archaeological potential.

At this moment in time, one can say that the “pile dwellings” around all the lakes throughout the foothills of the Alps are threatened by erosion to a greater or lesser extent. Decreasing groundwater levels are witnessed all across Europe, which effectively threatens all bog settlements. To date, however, this scenario has usually only concerned parts of the sites. As a rule, they show a succession of already badly eroded peripheral areas to sections at the centre of the settlements that are still intact. Bog settlements, in turn, show the opposite, i.e. the central areas are often located at higher levels and are therefore dried up more than the edges located lower down and are thus often still below the groundwater level.

Erosion protection measures and future possibilities

Because of the situation described above, numerous rescue excavations were carried out over the past 25 years in order to document acutely threatened settlement sites, while pure research excavations took a back seat. This strategy is basically in accord with the European Convention on the protection of archaeological heritage. The treaty document, ratified in 1992 is also called the 'Malta or Valletta Convention' and puts it plainly: the *in situ* conservation of archaeological cultural goods takes priority over an excavation. First experiments in actively protecting archaeological sites under water have also been carried out over the past approximately 25 years. The first methods have been developed almost simultaneously in Western Switzerland and Southern Germany. Initial experiments consisted of securing lakeshore sections by installing "rigid" reinforcements and coverings with sand bags, sand deposits and similar methods. For the past number of years, geotextiles covered with gravel deposits have proven successful. Various heritage protection agencies have developed specially designed floating implements in order to carry out this work and to put in place efficient and cost-effective erosion protection measures. The experiences with this method gathered over the past approximately ten years have been extremely positive. At the outset, the performance of the gravel coverings on top of the geotextile was viewed as the main critical aspect. It was feared that currents on the lakebed, for instance during storms, would shift the gravel and uncover the geotextile. So far, this has not occurred; however, empirical data on the most advantageous gravel mixtures and range of geotextiles is still incomplete. One must also ensure that any intrusions into the shallow water zone are ecologically viable and comply with legislation such as the Habitats Directive guidelines.

The method of using a combination of geotextiles and gravel deposits has proven so successful in Lake Bienne that, for instance, breakwater systems using timber palisades and fascines, which were still being installed until the late 1990s, no longer seem viable today.

While great strides have been made over the past twenty years in terms of protecting archaeological sites from erosion, efforts made with regard to the *in situ* conservation of archaeological sites in wetland areas have not evolved much. An exception to this rule is the Federsee region in Southwestern Germany, where new nature reserves have been identified in close collaboration with nature conservation organisations, and where large areas of land have been bought and withdrawn from intensive farming by reallocation procedures. In some areas, the groundwater levels could be raised again and the fluctuations in groundwater tables are now being closely monitored by numerous measuring stations. For the pile dwellings in other bogs throughout the Alpine region, however, there is no systematic monitoring, which would enable us to observe the long-term development of the state of organic wetland sediments. Changing to extensive farming in the proximity of small lakes and wetland areas is a first step. Extensive agriculture, however, involves a change in farming practices and limited use of fertilizers and manure. Such efforts clash with the wishes of the landowners concerned and can sometimes lead to conflicts.

Over the past number of years, a rich pool of practical knowledge has been amassed through international exchange of information and close collaboration. A network of experts dealing with the subject has evolved over the years, and there have been two round table talks to date (Archéologie et Erosion, Lons-le-Saunier

1994/Neuchâtel 2004), the results of which have been published. We aim, in future, to link up with other existing networks dealing with the same topics throughout the Anglophone and Nordic regions (Preserving Archaeological Remains *in situ* PARIS1-3, London 1996 and 2001/Amsterdam 2006). Focal points of the discourse would mainly be the protection of archaeological sites in wetland areas. In terms of pile dwelling bog settlements, the collaboration between heritage protection and nature conservation authorities and NGOs, and the consistent enforcement of treaties like the Ramsar Convention has, to date, only occurred in isolated instances; however, it must be demanded for the future.

The project initiated by Switzerland in 2004 to include the circum-Alpine pile dwellings in the list of UNESCO World Heritage sites primarily intended to protect the archaeological sites from further destruction. The UNESCO label provides invaluable support because archaeological sites such as pile dwellings attract public attention (and along with it financial assistance) and protection from other interests only if their scientific value is acknowledged at the highest level. The pile dwellings need dedicated lawyers who are fully committed to the fight for the protection of the archaeological heritage under water and in wetland areas.

(Translation: Sandy Haemmerle MA, Shantalla, Galway, Ireland, www.prehistrans.com)

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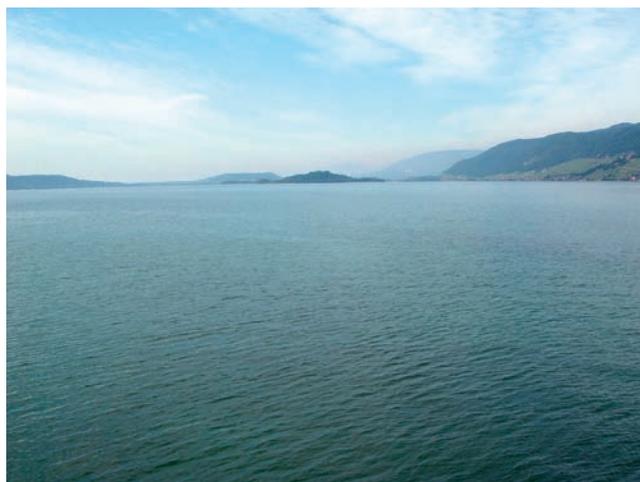
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Lake Federsee (foreground), situated 60 km north of the Alps (background) in the state of Baden-Württemberg, is a classic example of a dried up lake in the foothills of the Alps with a rich body of preserved settlements, plank ways and dugouts dating from the Stone Age to the Metal Ages. Nature conservation and heritage protection work hand in hand to create reserves and to raise groundwater levels. Photograph: Stuttgart Regional Council, O. Braasch.



Lake Bienna (Canton Berne) is one of the smaller bodies of water in the Swiss Midlands, which in turn are located between Lakes Geneva and Constance, the two largest European inland lakes. While there are 35 'pile dwelling' sites on the 17 km long Lake Bienna, Switzerland boasts a total of approximately 450 sites. Around 750 pile dwelling sites are known throughout the circum-Alpine region. Photograph: Archaeological Service of Canton Berne.



Aerial photograph of the pile dwelling site of Unteruhldingen on Lake Constance. The erosion of the shallow water zone is ongoing, palisades and ground plans of houses are constantly being exposed. Photograph: Stuttgart Regional Council, O. Braasch.

Excavation of the timber structures of a Late Stone Age house (dated dendrochronologically to 3279 BC) on Lake Federsee. For thousands of years, the preservation conditions in the peat were ideal; today, drainage systems and decreasing groundwater levels are threatening the archaeological evidence. Photograph: Stuttgart Regional Council, W. Hohl.

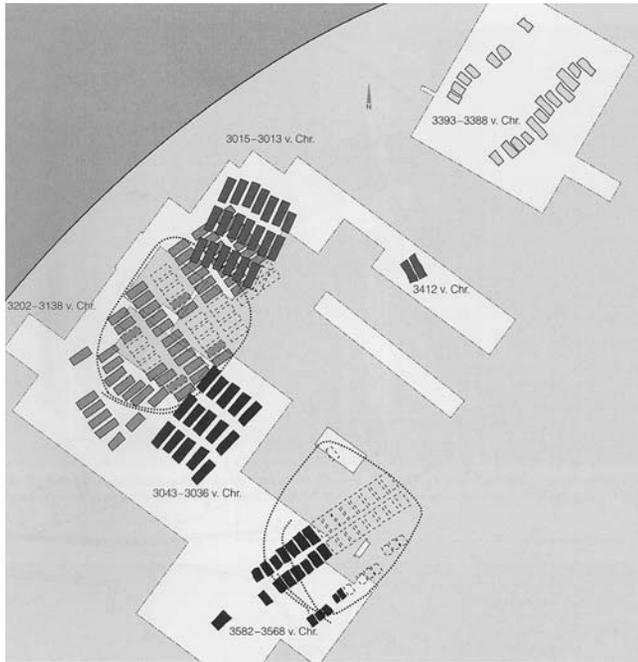


Divers among the piles at a site in Lake Bienne, which were exposed by the erosion of the lakebed. The situation pictured here is an extreme form of destruction caused by waves and wind and also by human intrusion into the natural balance of the body of water. Photograph: Archaeological Service of Canton Berne.



Situation of a pile dwelling site on Lake Bienne, the archaeological layer of which is in the process of disintegrating. Crabs are already burrowing into the archaeological layer – it looks like Swiss cheese. Jutting out of the lakebed are the stumps of piles from a settlement that was destroyed by a conflagration in 2704 BC.





Example of a Neolithic settlement sequence (Sutz-Lattrigen on Lake Biene) between 3600 and 3000 BC. During the rescue excavations, samples were taken from thousands of piles, which will be analysed by dendrochronological means and will provide exact dates. Figure: Archaeological Service of Canton Berne



Groundwater level measuring stations monitor the groundwater tables in an area of the Federsee bog, which has undergone wetland restoration. The archaeological evidence remains preserved beneath the peat cover. Photograph: Stuttgart Regional Council, H. Schlichtherle.



Erosion protection measures at Lake Biene, Switzerland (2003-2004). 'ROBOR' catamaran in action with geotextile mats. 6,000 m² of the settlement site in the bay of Sutz-Lattrigen have been covered over and 30,000 m² have been excavated archaeologically. Photograph: Archaeological Service Canton Berne.

Artefacts made of organic materials survived thousands of years in the wetland settlements throughout the foothills of the Alps in exceptional states of preservation. Textiles, wooden vessels, a comb and a knife dating from the Late Stone Age found at the lakeside settlements of Vinelz and Lattrigen on Lake Biene. Figure: Archaeological Service of Canton Berne/Stuttgart Regional Council, A. Kalkowski.



Divers recording exposed and eroded timbers. Rescue excavations often provide the last pieces of information before they are destroyed forever. Photograph: Archaeological Service Canton Berne.



Cultural Landscapes of Vernacular Architecture in Extreme Danger

Vernacular architecture is frequently made up of groups of buildings that are an integral part of the landscape, both in terms of their own environment as well as the natural environment that surrounds the settlement. Over the past years, several cultural landscapes where vernacular architecture was found have suffered from severe deterioration due to their alteration, destruction or disappearance.

The International Scientific Committee of Vernacular Architecture (CIAV) has decided to analyze this point, making it the main focus of its discussions during the annual meeting to be held in the Philippines in November 2007. The title of the conference is *Vernacular Landscape in Danger*, and one of the subtopics will be *The Safeguarding of Vernacular Traditions in Disaster Areas*.

The loss of this unique heritage is a grave matter, since it is protected in only very few cases. Vernacular heritage and the cultural landscape to which it belongs are defended only when a vernacular complex is part of a site that has been declared “historic” and is safeguarded by its native country’s heritage laws; otherwise, they tend to be rapidly altered. Since most traditional building materials such as wood, soil, stone and natural fibers do not contribute to global warming (in contrast to industrial ones such as steel and concrete), the conclusion can be drawn that materials used in vernacular buildings support sustainable development. It should therefore be considered that the significant reduction of built vernacular heritage considerably alters this type of balanced development that protects the environment better.

There are different reasons behind the disappearance of vernacular cultural landscapes. One, as mentioned before, is the absence of legal protection; a second one, encountered frequently, is uncontrolled urban growth and real estate speculation. The unrestricted exploitation of natural resources affects the landscape of the environment. But there are some other reasons that are not so tangible and are instead of a more cultural and subliminal character: for example, the desire different social groups may have of living in “modernity”, with a misconstrued concept of what is “modern”. This aspiration, which can be very legitimate, can however lead to the mistake of considering vernacular cultural landscapes as something out of the past, something that has to do with economic and social underdevelopment, and to associate it with the opposite of “modern”—and consequently the opposite of “progress”. Therefore, authorities at all levels fail to take into account the protection of cultural landscapes where there are groups of traditional vernacular architecture, and instead watch their slow disappearance with indifference, without attempting any kind of protection or recognition.

The destruction of vernacular cultural landscapes by natural disasters is also very serious. When a region is affected by an earthquake, a hurricane or any other type of disaster that—besides the irreparable loss of lives—causes severe damages to the vernacular cultural landscape, what usually happens is that reconstruction does not take into account the traditional forms of the buildings nor the settlements that gave value to the cultural environment.

The fact that these landscapes have not been appropriately recognized has also led to their neglect by academics and to the fact that they are hardly being taught at universities, especially at schools of architecture and higher learning. For instance, examples of these subjects are scarce in doctoral theses. Consequently, architects and other professionals that have graduated from universities do not consider vernacular cultural landscapes to have any value whatsoever and contribute to their destruction by implementing



Demolition of an adobe house

projects for new buildings with no relationship to the cultural or environmental context.

In face of this situation, what we propose is to discuss in as many forums as possible the historic importance of cultural landscapes whose distinctive feature is vernacular architecture; to make not only their cultural values known, but also the fact that their preservation can boost the economic growth of an area and reinforce the cultural identity of its inhabitants; to indicate how the loss of this heritage degrades cities and rural settlements, transforming them into places without quality of life, due to the absence of conservation of authentic landscapes. Dissemination by means of conferences, publications and interviews in the media can promote an understanding of the severity of the loss of traditional landscapes. Efforts are also necessary to increase the teaching, study and research of vernacular cultural landscapes in institutions of higher learning, in order to reinforce academics’ knowledge of the subject.

ICOMOS, by means of its national and scientific representatives, can tackle the task of dissemination among the authorities at all levels and in the very society that is being affected. This is why having discussion forums in each country and greater dissemination can help create the feeling and the need for preservation or even restoration of vernacular cultural landscapes.

Also, ICOMOS national committees from around the world should be present in places affected by natural disasters to aid in the adequate restoration of vernacular cultural landscapes.

Paisajes Culturales de Arquitectura Vernácula en Riesgo Extremo



Adobe house with thatched roof

La arquitectura vernácula constituye en numerosas ocasiones conjuntos edificados que forman parte integral del paisaje, tanto de su propio entorno como del medio natural que rodea al asentamiento. En los últimos años numerosos paisajes culturales en los cuales se ha insertado la arquitectura vernácula han sufrido un serio deterioro debido a su alteración, destrucción o desaparición.

El CIAV (*International Scientific Committee of Vernacular Architecture*), ha decidido analizar este tema que será el punto principal de sus discusiones durante su reunión anual que se llevará a cabo en el mes de noviembre en Filipinas. El tema de la conferencia es: "Paisajes vernáculos en peligro" (*Vernacular Landscape in Danger*). Uno de los subtemas será: "La protección de las tradiciones vernáculas en zonas de desastre" (*The safeguard of vernacular traditions in disaster areas*).

La pérdida de este singular patrimonio es muy grave pues en muy pocos casos se encuentra protegido. Sólo cuando un conjunto vernáculo forma parte de un sitio que ha sido declarado como histórico y está salvaguardado por la ley patrimonial del país de que se trate, se defenderá el patrimonio vernáculo y el paisaje cultural al que pertenece, pero de no ser así tiende a verse alterado rápidamente. En virtud de que los materiales de construcción tradicionales tales como la madera, la tierra, la piedra y las fibras naturales no contribuyen al calentamiento global como ocurre con los de tipo industrial, por ejemplo el acero y el concreto, se puede concluir que los materiales empleados en las construcciones vernáculas apoyan el desarrollo sustentable. Por ello debe tenerse en cuenta que la disminución significativa del patrimonio vernáculo edificado altera significativamente este tipo de desarrollo equilibrado que protege mejor al medio ambiente.

Las causas de la desaparición de los paisajes culturales vernáculos son diversas. Una, como lo hemos señalado es la falta de protección jurídica, otra que a menudo se presenta es el crecimiento urbano y la especulación inmobiliaria incontrolados. La explotación irrestricta de los recursos naturales afecta el paisaje del entorno

ambiental. Pero hay algunas otras razones, más de carácter cultural y subliminal que tangibles: por ejemplo el deseo de los diversos grupos sociales de vivir en la "modernidad", cuando moderno es un concepto mal entendido. Esta aspiración que puede ser muy legítima, lleva a cometer el error de considerar al paisaje cultural vernáculo como perteneciente al pasado, al retraso económico y social, a vincularlo con lo opuesto a lo moderno y por lo tanto al progreso. Por ello autoridades de todos los niveles omiten la protección de los paisajes culturales en los que se insertan grupos de arquitectura tradicional vernácula y simplemente ven con indiferencia su desaparición paulatina, sin intentar algún tipo de protección y de reconocimiento.

Es también muy seria la destrucción de los paisajes culturales vernáculos que se ven afectados por desastres naturales. Cuando una región es azotada por un sismo, huracán o cualquier otro tipo de desastre que además de cobrar vidas cuya pérdida es irreparable, causa graves daños al paisaje cultural vernáculo, lo común es que la reconstrucción no considere la forma tradicional de las construcciones ni los asentamientos que le daban valor al entorno cultural.

El hecho de que estos paisajes no se hayan reconocido oportunamente también llevó al olvido su estudio por parte de los académicos y de su enseñanza en las universidades, muy especialmente en las escuelas de arquitectura y de educación superior. Son muy escasos los ejemplos de estos temas en las tesis de doctorado, por ejemplo. Por lo tanto los arquitectos y otros profesionales egresados de las universidades no les consideran valor alguno y contribuyen a su destrucción al realizar proyectos de nuevas edificaciones sin relación alguna con el contexto ambiental ni cultural.

Ante esta situación lo que proponemos es difundir en todos los foros posibles la importancia histórica de los paisajes culturales cuyo rasgo distintivo sea la arquitectura vernácula. Dar a conocer no solo sus valores culturales sino el hecho de que su preservación puede impulsar el crecimiento económico de un sitio y reforzar la identidad cultural de sus habitantes. Señalar cómo la pérdida de este patrimonio degrada las ciudades y los poblados rurales, convirtiéndolos en sitios carentes de calidad de vida, en virtud de la falta de conservación de un paisaje auténtico. Solo la divulgación por medio de conferencias, publicaciones y entrevistas en los medios, puede ayudar a comprender la gravedad de la pérdida de los paisajes tradicionales.

Es necesario también hacer esfuerzos por impulsar la enseñanza, estudio e investigación de los paisajes culturales vernáculos en las escuelas de educación superior, para reforzar el conocimiento de los académicos sobre el tema.

El ICOMOS por medio de sus representaciones nacionales y científicas puede llevar a cabo la tarea de la difusión ante autoridades de todos los niveles y ante la misma sociedad afectada. Por ello la realización de foros de discusión en cada país a los que se les brinde la mayor difusión podrá ayudar a crear el sentimiento y la necesidad de la preservación o de la restitución, en su caso, de los paisajes culturales vernáculos.

Asimismo las representaciones diversas de ICOMOS en el mundo deben estar presentes en los sitios afectados por desastres naturales para auxiliar en una adecuada restitución del paisaje cultural vernáculo.

The World Heritage Convention and the Buffer Zone

The World Heritage Convention and the Buffer Zone was the subject of the 2006 symposium of the International Scientific Committee on Legal, Administrative and Financial Issues (ICLAFI). Meeting in Hiroshima, Japan, November 26 through December 1, the committee addressed the issue through several case studies, including the Atomic Bomb Dome.¹

Participants from 15 countries participated in the workshop, including 17 participants and 16 observers from Kyushu University, Tokyo University and ICOMOS Japan. The participating countries were Australia, Belgium, Bulgaria, Canada, Croatia, Finland, Germany, Japan, Netherlands, Peru, Poland, Spain, Sri Lanka, Sweden, and United States of America.

The protection of a World Heritage site has long been focused on the core area in which the World Heritage site was located. The original operational guidelines (1977) to the World Heritage Convention (1972) did not focus on the broader surroundings of the World Heritage site at all. It is only since the revision of the operational guidelines in 1980 that the protection of the broader surroundings was inscribed under the concept of the buffer zone. It was recognized that the universal value of a Cultural Heritage site could be jeopardized by alterations in its broader surroundings. Notwithstanding this formal recognition, many aspects remained unclear. Many problematic cases involving changes occurring within the buffer zone emerged. The revision of the operational guidelines in 2005 aimed partially at responding to the problems of the concept of the buffer zone. The inclusion of a definition and some requirements for its application could be seen as a major improvement.

This recent evolution is one of the main inspirations for the topic of the conference. A recent building project in the near vicinity of the World Heritage site of the Atomic Bomb Dome, located within the buffer zone, was another source of inspiration for the topic. The latter made it also appropriate to choose Hiroshima as the venue of the conference. The choice of Hiroshima was further instigated by what is happening in a small fishing village, Tomonoura, near Hiroshima. Even though Tomonoura is not recognized as a World Heritage site, it has long-standing value as a part of the cultural route between Japan and Korea. The village might lose its value by a bridge building project completely altering the surroundings of the harbor and the village. The well-preserved natural and historical heritage might be lost for future generations. Comparable to the Atomic Bomb Dome, Tomonoura shows that respect for the surroundings of a valuable heritage site is of utmost importance.

The World Heritage Convention (WHC) is undeniably one of the most successful projects of UNESCO. Since its adoption in 1972, the World Heritage Committee has inscribed 830 properties of outstanding universal value as World Heritage. The preservation of these World Heritage sites, however, has not always been smooth. A lot depends on how local legislation has been elaborated.

In Japan, for example, the Law for the Protection of Cultural Property does not protect the buffer zone. The Operational Guidelines for the Implementation of the Convention require that a buffer zone be determined whenever it is necessary for the proper conservation of the cultural or natural property. In order to fulfill this requirement, Japan has developed the practice of recourse to various laws regulating areas for purposes other than the conservation of its cultural value. Hence, the legal basis for the buffer zone

in Japan is very fragile. Related to this, the concept of the buffer zone is not legally elaborated, and therefore its objectives are not clear. Under current practice, it fully depends upon the goal of each separate law. We might expect that what is designated as the buffer zone will be regulated, for example, by laws to preserve natural resources or to prevent the construction of large-size factories. If these laws were amended for reasons which have nothing to do with the protection of cultural property, the protection of the buffer zone would be weakened.

The construction of a tall apartment building in the neighborhood of the Atomic Bomb Dome in Hiroshima exemplifies the urgent need to rethink the Japanese approach towards the concept of the buffer zone. To reach this goal, this conference was set up to learn from experiences in other countries and use them to draft a recommendation.

The participants took part in a site visit to Hiroshima Peace Park and the Atomic Bomb Dome. Prof. Maeno, President of ICOMOS Japan, and Prof. Kono, Kyushu University and ICLAFI member of ICOMOS, guided the participants during the visit, demonstrating that the buffer zone around the World Heritage site of the Atomic Bomb Dome is not well respected.

The participants were interested to know why five tall apartment buildings, including one in the immediate vicinity of the Atomic Bomb Dome, could be constructed within the area designated as a buffer zone to this World Heritage site. Moreover, questions were raised in regard to the appearance of the buildings just outside the buffer zone. It became apparent that one of the buildings just outside the buffer zone would have to be demolished because of its non-conformity with the nature of the neighborhood.

From the Hiroshima Peace Park, the participants went to Tomonoura. This small fishing village has an extremely well preserved visual environment dating back to the Edo-period. Besides this external value, Tomonoura has also an intrinsic value. Historically, this port has functioned as a cultural route between Japan and Korea. Even though this unique ensemble is not inscribed as a World Heritage site, it deserves attention. Similar to what is happening to the site of the Atomic Bomb Dome, this unique ensemble is in danger of losing the previously mentioned values by a bridge building project.

The presentation of the papers was initiated by Professor Kono, who explained the emergence of the concept of the buffer zone in World Heritage law. The introductory presentation was followed by the general presentations over two days. The full text of the presentations may be found on the Internet at: <http://www.law.kyushu-u.ac.jp/programs/english/hiroshima/index.htm>.

The outcome of the conference on the World Heritage Convention and the Buffer Zone is laid down in three recommendations, one for the Atomic Bomb Dome, one for Tomonoura and one for ICOMOS. The recommendations were presented to the general public in their original language (English) and in a translated version (Japanese). The recommendations on the Atomic Bomb Dome and Tomonoura illustrate that the protection of the surroundings is a problem and it needs to be taken much more seriously. How the protection should be properly done is an issue for further study. Therefore, an additional recommendation was adopted, addressing ICOMOS to promote the study of the buffer zone concept.

Recommendations for the Atomic Bomb dome

We, the expert members of the International Committee for Legal, Administrative and Financial Issues of ICOMOS attending the Conference on The World Heritage Convention and the Buffer Zone in Hiroshima, Japan:

Acknowledging with sincere appreciation the International Council on Monuments and Sites Japan (ICOMOS Japan), and the Asia/Pacific Cultural Centre for UNESCO (ACCU) for their valuable organization of the conference;

Recognizing that the buffer zone issues have been very important in World Heritage, especially their legal, socio-economic, environmental and political aspects;

Welcoming the decision to remove the black building, Shokokaigisho, located very near the Hiroshima Atomic Bomb Dome as it harms the view and diminishes its cultural integrity and outstanding universal value;

Expressing our deep regret and disappointment over the construction of five high-rise buildings in the buffer zone, including the recently completed apartment building adjacent to the Atomic Bomb Dome;

Being concerned about possible similar constructions in the future;

Call upon the Prime Minister of Japan, the Governor of Hiroshima Prefecture, and the Mayor of Hiroshima City:

- 1. To study and reflect upon the cases of Cologne and Dresden as they pertain to construction that impedes, if not diminishes, the overall integrity of the property inscribed as a World Heritage site;*
- 2. To see the planned demolition of the Shokokaigisho building as a recognition that obstruction of the view and spatial integrity of a World Heritage site is a diminution or dilution of its cultural value and to ensure that any future use of this area will strengthen the outstanding universal values of the World Heritage site; and*
- 3. To adopt binding regulations to control development projects in the vicinity of the World Heritage site in terms of height restrictions, building color, aesthetics, and other compatibility factors.*

These Recommendations were adopted in Hiroshima, Japan, on 29 November 2006, during the Conference on The World Heritage Convention and the Buffer Zone.

Recommendations for Tomonoura

We, the expert members of the International Committee for Legal, Administrative and Financial Issues of ICOMOS attending the Conference on The World Heritage Convention and the Buffer Zone in Hiroshima, Japan:

Considering that by Resolution No. 9 on the Tomo Bridge, the 15th General Assembly of ICOMOS in Xi'an, China, resolved to ask the Prefectural and City Government to reconsider the Tomo bridge proposal since conservation should embrace the visual environ-

ment, including the adjoining sea, the islands and mountain backdrop it should consider the historical role of the port including its function as part of the cultural route between Japan and Korea. The proposed bridge would damage or completely destroy a number of these important values;

We strongly endorse Resolution No. 9 because it recognizes the great value of Tomonoura to the cultural heritage of Japan.

Call upon the Prime Minister of Japan, the Governor of Hiroshima Prefecture, and the Mayor of Fukuyama City:

- 1. To consider the port and town of Tomonoura as a unique ensemble of international significance that should be preserved in its entirety;*
- 2. To draw on the valuable experience of the city of Dresden, which was placed on the World Heritage Endangered List, to realize that the conservation of important sites, be they potential or already inscribed on the World Heritage List, entails the preservation of the site itself and also the protection of the environment and surroundings, crucial for the integrity of the unique ensemble;*
- 3. To abandon the bridge building project and reconsider the alternatives that do not harm the unique ensemble.*

These Recommendations were adopted in Hiroshima, Japan, on 29 November 2006, during the Conference on The World Heritage Convention and the Buffer Zone.

Recommendations for ICOMOS

We, the expert members of the International Committee for Legal, Administrative and Financial Issues of ICOMOS attending the Conference on The World Heritage Convention and the Buffer Zone in Hiroshima, Japan:

Acknowledging with sincere appreciation the International Council on Monuments and Sites Japan (ICOMOS Japan), and the Asia/Pacific Cultural Centre for UNESCO (ACCU) for their valuable organization of the conference; and

Recognizing that the buffer zone issues have been very important in World Heritage, especially their legal, socio-economic, environmental and political aspects;

Call upon ICOMOS:

- 1. To further study the issues of buffer zones and how they can be adequately protected and, in the process, support the cooperation of its relevant committees, acting jointly, on buffer zone issues;*
- 2. To increase awareness of the existence, necessity and protection of buffer zones in the Asia-Pacific region and localities;*
- 3. To convince national governments, local governments, corporations and construction companies to be respectful of heritage places and their buffer zones and that any development must be compatible with their protection and enhancement;*
- 4. To conduct activities that emphasize the belief that corporate*

goals should include the continuing and genuine commitment by the business sector to behave responsibly and ethically and exercise an important duty of care to all of its stakeholders including the community at large;

5. To promote the idea of responsible citizenship as a key element in the preservation and promotion of cultural heritage;

6. To further stress education to intensify global awareness of the measures needed to protect heritage sites and their buffer zones so as to preserve and transmit to future generations the cultural context of World Heritage sites, both listed and potential;

7. To stress the idea that every World Heritage site has intangible aspects and dimensions, notably the cultural and historical, that must be respected; and

8. To promote these significant matters to the World Heritage

Committee and the member-states of the World Heritage Convention.

These Recommendations were adopted in Hiroshima, Japan, on 29 November 2006, during the Conference on The World Heritage Convention and the Buffer Zone.

(Both issues are also discussed in the Japan report, pp. 102-104)

ICLAFI

¹ The Symposium was organized by ICOMOS Japan and the Asia/Pacific Cultural Centre for UNESCO (ACCU), in cooperation with Kyushu University as one of the 2006 Programmes for Professionals in the Fields of UNESCO's Competence within the framework of the ACCU International Exchange Programme under the UNESCO/Japan Funds-in-Trust for the Promotion of International Cooperation and Mutual Understanding.

Logistic and Other Factors Constraining Conservation of Heritage Sites in Antarctica

While there are important conservation projects being conducted at many worldwide sites where access and environmental factors create major difficulties, many of the most complex problems presented to managers and conservators arguably occur in polar regions. Some of the world's most unique historic sites are located in the Antarctic and Arctic and the challenges that must be overcome in order to conserve them, make them subject to risks that are normally less severe in other parts of the globe.

Perhaps the most obvious difficulty arises because these higher latitudes experience long periods of darkness during winter so conservation work is necessarily restricted to a few weeks during the summer. Freezing temperatures and extreme weather conditions, however, continue to create practical problems, even in summer. What is less obvious though, is that problems of access to polar sites generate complex logistical challenges. Combined, these factors severely limit the opportunities to reach the sites and periods of work when conservation activities are possible.

Access

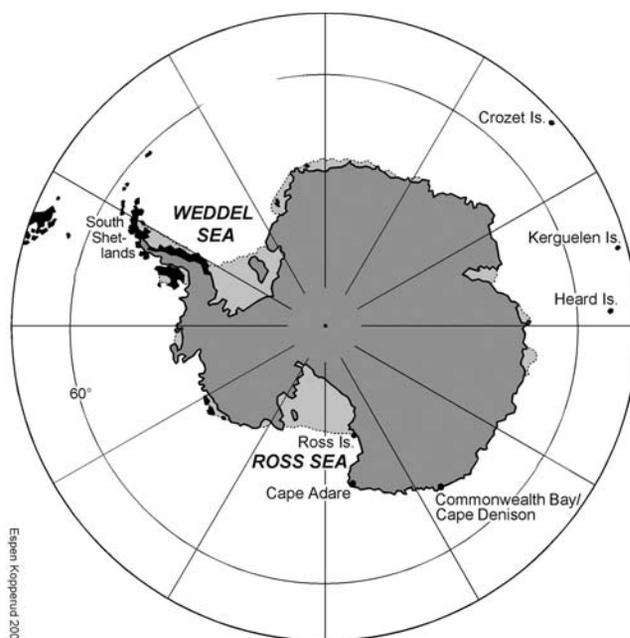
No matter where you depart from, you must cross over 1,000 km of some of the roughest seas in the world to reach any part of the Antarctic continent. In winter sea ice spreads north from the continent, so a landfall by sea is impossible until mid-summer. Even then sea access is only possible in favourable conditions for a period of six to eight weeks before the ice returns.

While it is possible to travel by air to some parts of Antarctica, air transport is restricted and specialist aircraft are required. Limited private services are available into a very few parts of the continent but the only flights into most areas are managed by government research programmes. Use of these may be granted to reach one of the government bases but once there, helicopter transport or some form of surface travel is needed to reach the historic sites.

Given such problems of access, the need to carefully plan work at any of these sites becomes paramount. In addition to the requisites of the conservation work itself, practical and safety considerations demand meticulous planning of transport, provisioning and shelter.

Environmental constraints

In Antarctica additional constraints are presented by the need to comply with the provisions of international agreements that were originally designed to protect flora, fauna and the environment. Now the Antarctic Treaty and its associated protocols provide a regulatory framework to protect the natural, as well as the historic values of the continent. Clearly there are significant benefits that come from these internationally recognised mechanisms for protection of historic sites, but the same regulatory system places onerous conditions on the way conservation work is conducted. Compliance



Map of Antarctica (Credit: International Polar Heritage Committee)

with these conditions can in some cases limit aspects of the work, but at the very least compliance demands extremely detailed planning and preparation.

The physical environment in Antarctica creates additional difficulties. The same harsh weather that accelerates the wear and tear on the structures also poses challenges (and some risk) for those engaged in the conservation work. Conservators can of course adapt to the discomfort of working in extreme weather conditions and living in primitive accommodation, but the limitations of such basic needs as fresh water and "portable energy sources" make the task of conservation very difficult. Safety also becomes an issue when the isolation of the site makes rescue difficult if not impossible.

For the purpose of illustrating these problems, this article focuses on a site in Antarctica.

Borchgrevink's huts – Cape Adare

Cape Adare lies at the western entrance to the Ross Sea. Further south, on Ross Island, can be found three other historic sites where the better-known explorers Robert F. Scott and Ernest Shackleton made their bases. These four sites date from the so-called "heroic era", a period generally regarded as being from 1889 until 1917.

Cape Adare is without doubt one of the world's most isolated historic places and where the first structures ever built on the Antarctic continent still stand. They were erected on the same rocky beach where, in 1895, the first documented landing on the continent took place. These two unique huts were built five years later by Norwegian Carsten Borchgrevink as his base for the

"British Antarctic ("Southern Cross") Expedition" - 1898-1900. This expedition became the first to winter-over on the Antarctic mainland. The two wooden structures, built side by side, were originally connected by an improvised annex.

This site is designated within the Antarctic Treaty System as an "Antarctic Specially Managed Area" (ASMA No. 159). It also embraces the ruins of the hut built later by Scott's Northern Party during the British Antarctic Expedition of 1910-13. Conservation of the site is being undertaken by Antarctic Heritage Trust (AHT), an international organisation based in New Zealand. The Trust is responsible for the three other sites in the Ross Sea region and has charitable status in several countries.

The flat shingle beach on which the huts are constructed is about 45 hectares in area and presented an appealing location for the early explorers. Unfortunately though, it is also an appealing site for penguins and now one of the greatest difficulties faced by conservators is that it is the location of the largest breeding colony of Adelie penguins in the world. From October to February each year, 500,000 pairs of Adelies converge on the beach to build nests that cover nearly every square metre of the site to form an almost impenetrable barrier. Like other wildlife on the frozen continent the penguins are protected and cannot be disturbed. Such a concentration of penguins also produces tons of guano which they deposit around the huts and over the many artefacts that now lie buried there.

Logistics

Cape Adare lies about 3,000 km south of New Zealand. It is almost another 1,000 km further south to Ross Island where the Antarctic bases and ice-runways of New Zealand and the USA are located. There are no suitable areas at Cape Adare to land a fixed wing aircraft and without a complex array of fuel depots, it is well out of range of helicopters.

The only practical option for access, therefore, is with ice-strengthened ships. Then the only realistic options depend either on assistance from US Coast Guard icebreakers (through international research programme agreements) or on the goodwill of Antarctic tour operators.

By mid summer the sea-ice has usually broken up enough to approach the Cape by boat. Even then, however, the use of zodiacs to shuttle workers, equipment, fuel and supplies through the drifting sea ice and strong currents remains difficult and often dangerous. After a successful landing it is still difficult to find a space to set up camp. By this time some of the earlier penguin chicks have fledged and begun to leave the beach and the density of birds slowly reduces, but tents must still be erected on a bed of penguin guano. Initial water supplies must be taken ashore until clean ice can be collected from some distance away.

Conservation techniques

The fabric of such Antarctic sites inevitably means conservation of a wide range of materials, and experience has shown that successful techniques in temperate climates can be ineffective in cold climates. Some techniques are simply impractical, especially procedures that require use of water or coatings that react badly to freezing temperatures. The situation is compounded by the fact that all such historic sites in Antarctica are within metres of the coast and its salt-laden atmosphere.

Planning

Getting a conservation party on site and providing them with the essential "life support" materials demands careful and complex planning. In many respects the planning of a conservation project is almost as complex as the expedition itself.

In any event initial planning needs to begin at least two years ahead of the intended work to ensure that the necessary transport is available. The most recent expedition during the summer of 2003 was to a large extent a scoping expedition and since then planning has continued for the next expedition which has no confirmed date. For 2003 the first requirement was to arrange access and with uncertainties about the availability of a US Coast Guard icebreaker, negotiation was required with a tour operator which had itineraries that might suit timing for putting in and picking up the work party. Fortunately, Quark expeditions were able and willing to cooperate, so the party was transported aboard their icebreaker "Kapitan Khlebnikov".

Once transport is confirmed, the employment of appropriate conservators can proceed. Conservators of course need a range of specialist equipment and materials so further detailed planning for these is essential because, once on site, the lack of a relatively minor item can quickly turn success into failure. Once in the field there is no prospect for delivering anything that has been forgotten so such oversights can mean not only a compromised project, but perhaps more seriously, compromised safety.



Cape Adare huts (Credit: Paul Chaplin)

Interior artefacts (Credit: Paul Chaplin)



Because of the complexity of access and on-site accommodation, conservation teams are necessarily small, but even a small team must have large amounts of equipment and provisions if it is to be safe for an extended period in the field. Living conditions in the field in Antarctica are seldom comfortable, but they must provide for adequate rest and shelter if the work programme is to be completed.

Other considerations

Weather. Cape Adare is renowned for its strong winds. Hurricane force winds can sweep in with little warning and not only make work impossible but make moving about the site dangerous. Twenty-four hour daylight does help maximise possible work periods during these summer months, but while temperatures can at times be above zero, the wind chill factor can be a severe limitation. Work parties in the past have also reported problems caused by wind driven salt spray that saturates tents and clothing.

Safety. Should an accident or illness occur that requires an emergency evacuation, this may only be possible with the cooperation of the Italian Antarctic programme and a long range helicopter from their base about 250 km further south.

Fire. Strangely enough, one of greatest risk factors in polar areas is fire. The atmosphere is generally very dry and many of the conservation materials involved are highly combustible. Conservation processes, as well as the comfort of conservators, often require some form of heating. Available forms of energy are limited it is not easy to create heat without some form of naked flame so extreme care is essential. Should a fire begin it could quickly become a disaster given the lack of water in liquid form.

Compliance. Legal constraints are created by the need to comply with the (New Zealand) Antarctic Environmental Protection Act 1994. This requires all on site work to be subject to one or more environmental impact assessments to ensure that the work involved will not have adverse effects on the environment or wildlife. To ensure this often demands compromises that would not become limitations in other parts of the globe.

There are also other compliance issues that govern the way in which different tasks must be carried out. New Zealand legislative constraints include the Resource Management Act 1991, The Building Act 1991, The Health and Safety in Employment Act 1992 and The Historic Places Act 1993, all of which dictate minimum standards of various kinds. Few of these pieces of legislation were enacted with any consideration for the unique and demanding conditions that must be faced when working in remote and difficult polar locations.

Causes of deterioration

In addition to the forgoing practical constraints that generate unique problems for work at such sites there are a range of physical factors that impact directly on the historic materials at the sites.

Wind. In addition to the effect that wind has on working conditions it contributes in no small way to the deterioration of historic materials. In winter the frequent hurricane force winds blast the

structures with wind-bourne ice and stone particles causing abrasion and erosion of building materials. These extreme forces also place massive physical strains on the structures causing mechanical damage. Evidence of this is very visible at the nearby hut built in 1911 by Captain Scott's so-called Northern Party. This conventionally framed structure has now been reduced to ruins.

Biological decay. There is a popular belief that the freezing conditions prevent biological decay but this is far from the truth. Many forms of organism continue to function in sub-zero temperatures and when temperatures periodically rise above freezing during summer months, bacterial, fungal and other organisms flourish. This not only causes decay in the wooden structures, but in the many other materials that make up the huge variety of artefacts remaining in the huts.

Marine effects. The wind driven salt spray that causes comfort problems for work parties is also the cause of more serious problems for historic materials. Salt acts as a catalyst in the oxidation of all ferrous materials and this has become a major problem with iron fastenings and other components in the hut structure. The ferrous content of the artefacts within, such as food cans and implements, are also adversely affected.

Fluctuations in temperature and relative humidity. It is well known that the effect of temperature change, and in particular freeze/thaw cycles, can cause a breakdown of many materials. The site at Cape Adare is no exception as the wooden structure absorbs water from surrounding snow and ice as well as windborne salt water. The surface layers of the wood are then regularly subjected to freeze/thaw cycles causing mechanical breakdown of the fibres.

These ambient temperature changes are exacerbated by the effect of solar warming which is transmitted into the hut causing changes of internal relative humidity with subsequent problems of condensation and ice build up on items within.

Wildlife. As previously mentioned the constant presence of penguins during the short months of summer hinders work because the prescribed codes of conduct mean that wildlife cannot be disturbed. A greater problem however comes from the guano they deposit. When the original human occupants departed they left many of their stores around the huts and these have now been buried under a thick layer of guano. The same guano provides a fertile medium for bacteria and other organisms that attack historic materials.

Mawson's hut – Cape Denison

This article can only provide a summary of some of the special factors that impact on conservation in Antarctica, and to some extent in Arctic regions. It is by no means a complete overview of the conservation challenges posed in such places. With this in mind it should be noted that, while the historic site at Cape Adare is perhaps a more extreme example of risk factors that apply to such sites, it is by no means unique.

By way of providing a similar example of these problems, it is relevant to mention an equally difficult site built in 1912 by Sir Douglas Mawson for his "Australasian Antarctic Expedition (AAE) 1911-14". The huts he built remain at Cape Denison, in

Commonwealth Bay, over 1,000 km to the west of Cape Adare. Cape Denison has justifiably earned a reputation as "the windiest place on earth". In historic terms, Mawson's achievements were unfortunately overshadowed by the events surrounding Amundsen's and Scott's bids to be first to the South Pole, but he nevertheless left a very important legacy of scientific study and discovery in Antarctica. His former base at Cape Denison remains one of the most significant historic sites on the Antarctic continent.

The primary responsibility for this site lies with the Government of Australia which has vested the management of it in the Australian Antarctic Division (AAD). The Mawson's Hut Foundation, an independent agency, is the major source of funding for the conservation of the site which has a place on the Australian National Heritage List, as well as being listed within the Antarctic Treaty System as an "Antarctic Specially Protected Area" (ASPA No.162).

As with Cape Adare, the remoteness of Cape Denison, not only from Australia but from other Australian bases, creates major logistical constraints on planning and implementing conservation work. Virtually all the conservation problems that exist for the site at Cape Adare apply at Cape Denison and the majority of them apply in varying degrees at a range of other historic sites in the Antarctic.

These factors combine to make conservation of historic sites in Antarctica (and many heritage sites in the Arctic) considerably more challenging than conservation projects in less extreme climates. As a consequence, these unique polar historic sites often face greater risks than the majority of sites in more temperate regions.

Additional information about Cape Adare and the Borchgrevink expedition can be found at: www.norwaysforgottenexplorer.org/, and www.heritage-antarctica.org/index.cfm

More information on the Mawson's Hut site is available from: www.aad.gov.au/default.asp?casid=217, and www.mawsons-huts.org.au/

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Mawson's hut (Credit: Geoff Ashley)