

World Heritage

ADOBE

Timeless Masterpieces

BOROBUDUR

The Glory of Buddhist Art

BAKU

City on the Silk Road

ROBBEN ISLAND

Refuge to Courage

E.8

WOOD PARK

Mother Nature's Cathedral



Latin America and the Caribbean, Africa and the Middle East.

Furthermore, there are numerous sites on the Tentative lists of States Parties fully or partially constructed from adobe which are now protected by local/national legislation.

These can be found in Ouarzazate in Morocco, a country which boasts a rich heritage in this respect, including some outstanding pieces of contemporary architecture, in South America, Central Asia, the Arabian Peninsula and the Near East.

This tremendous wealth of earthen architectural heritage, including archaeological sites, and a varied and rich 'vernacular' architecture, covers thousands of years. We may well be reminded of the inscription on the base of a raw-earth pyramid near Cairo: 'Do not disdain me when comparing me to the pyramids in stone. I am as high above them as Jupiter is above the other gods, for I was built in bricks made from the silt of the bottom of the lake.'

Earthen heritage is at present seriously threatened by natural and human causes (physical and environmental deterioration,

industrialization and ill-conceived technological penetration). This has prompted research and the application of conservation methods to ensure stability and understand the mechanical behaviour of structural forms and thus find appropriate technologies for restoration and adaptive reuse of adobe monuments.

There are some excellent examples of earth restoration projects in South America in buildings of the seventeenth to twentieth centuries – houses, haciendas, conversions to banks, museums, hotels, health centres and ministries. Architects are taking up this creative challenge in the region. Needless to say, restoration and consolidation of housing is a priority and should be accompanied by adaptive reuse of a social mix.

This wealth confronts us with a responsibility to preserve the past, to guarantee its sustainability and, above all, its present use and continuation as a traditional, technological heritage. For the issue is not only historical. We have to bear in mind the needs of millions of people who depend on the continuity of this technology for shelter and, indeed, their very existence. Adobe is a vital

construction material for the poor.



THE CONTEMPORARY CHALLENGE

ONE OF THE MAIN problems in today's world is the housing shortage. We know that in the next fifteen years or so, 700 million houses must be built for inhabitants of developing countries. Nearly 50 per cent of the world population now lives in slums, shanty towns or improvised shelters.

But this can be reversed. Evolving communities and communal co-operation and self-help can create new towns in which people may live decently.

World Bank studies and the 1996 HABITAT Conference in Istanbul have reaffirmed the fact that at least 50 per cent of urban families cannot afford even the cheapest house on the market and, although we have been talking about low-cost housing for decades now, the majority of the world needs a house at very little cost – or no cost at all. Here again adobe comes to mind.

Material used in housing for the poor must be cheap, easy to manipulate, labour-intensive and immediately available. Traditional construction materials such as mud, wood, straw and stone have precisely these characteristics.

Mud is still the most widely used material, and will probably continue to be used for a long time. As the late Jorge Hardoy, the

city planner, pointed out, the moment has come for housing planners to stop praising these traditional building materials and to start using them. In 2003, appropriate technology looks like a distant dream. So why not devote all that we have learned on the conservation of adobe through scientific research and fieldwork to improving this material and its associated components, at the service of millions of people? This clearly requires us to focus our efforts on self-help projects and improving the habitat by offering the most crucial and basic services for health, water/sanitation, sewage, education and shelter.

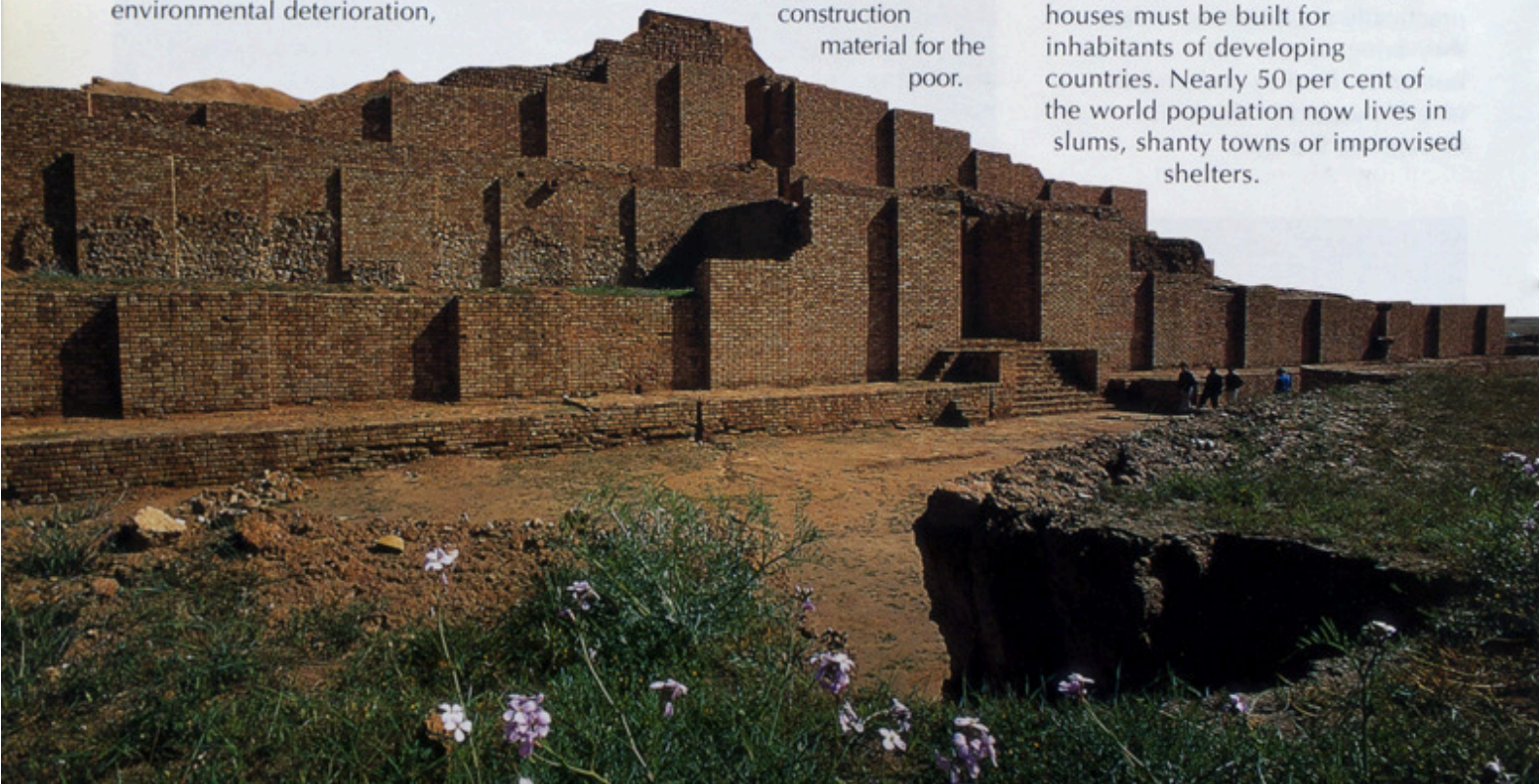
All the findings of the International Specialized Community in Adobe Conservation (UNESCO, ICCROM, CRATERE-EAG, ICOMOS, The Getty Conservation Institute, Aga Khan Foundation, World Monuments Fund, UNESCO Chair on Earthen Architecture at the School of

Above, the old city of Shibam in Yemen (called the 'Manhattan of the Desert' because of its tall buildings) is an exceptional example of earthen construction. Left, the northern entrance of Tchoga Zanbil (Islamic Republic of Iran) seen from the wall of the first enclosure.

Architecture of Grenoble, universities and research institutions) can serve contemporary societies' basic needs and aspirations.

The United Nations and world leaders have pledged to halve poverty by 2015. How can this be achieved?

These issues have already been raised in the later decades of the



twentieth century by such leaders of the developing world as Julius Nyerere and Indira Ghandi.

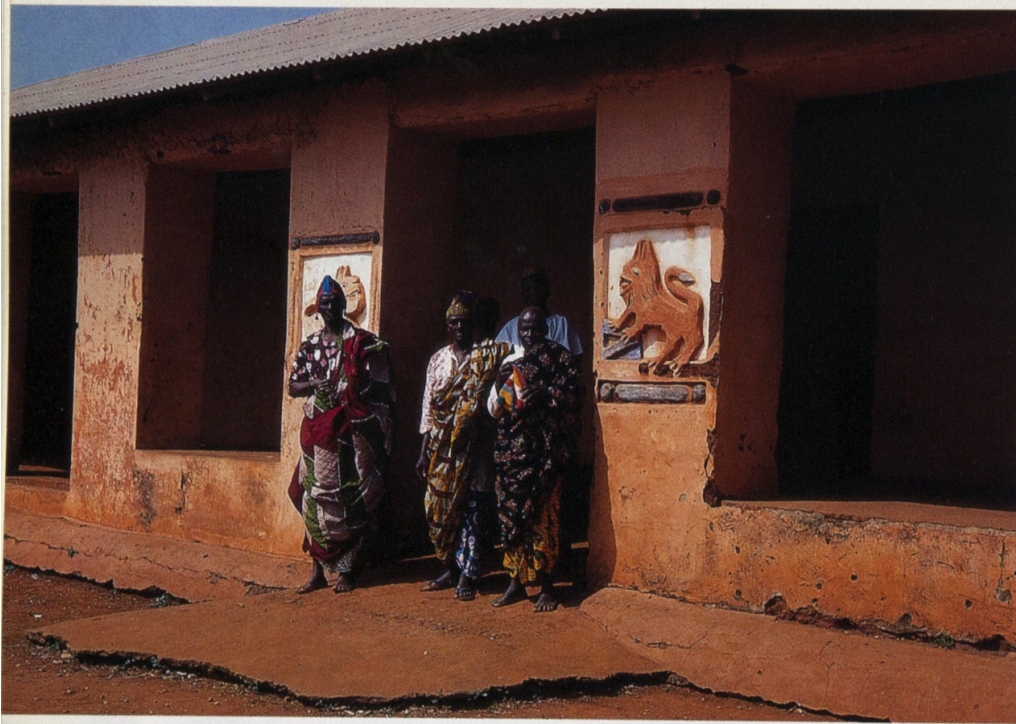
'People insist on waiting for a corrugated tin roof and a house built of 'European earth', that is, cement', said Nyerere. 'If we are to progress, we must overcome these mental blocks. ... The majority of people do not possess the means necessary to buy a cement house. Therefore, if we do not help them to build an

improved house with traditional materials ... we will have done nothing to help them live in a decent home.'

'All the new houses,' Indira Ghandi declared in an interview given to Earthscan in 1980, 'are built to consume energy. They are hot in summer and cold in winter. But our old houses were not so. ... We must look into traditional technology. There is much logic to be found in what people have

The ksar of Ait-Ben-Haddou in Morocco (right) is an important example of an earthen construction in a semi-desert habitat.

Left, one of the Royal Palaces of Abomey in Benin, also built from adobe, and a view of Byrsa Hill at the archaeological site of Carthage in Tunisia.



created throughout centuries, in harmony with their climate, their environment, their life-style. We cannot conserve all of it, because our manner of life has changed, but I believe a great part of it can be adapted and made more efficient.'

The late Hassan Fathy, an architect who enhanced earthen architecture in Egypt, saw how new cities such as Aswan had become small poor-taste replicas of Cairo. In Gharb, on the contrary, he found a clean harmonious city built in adobe following ancient traditions. In 1940, Fathy built a whole town in adobe near Luxor. He met with opposition and scorn from his colleagues, but in 1980 he received the Aga Khan Award for Architecture and today his work is considered a significant contribution to contemporary architecture. His 1973 book, *Architecture for the Poor*, is a vivid example of his vision. As he points out, no architect can avoid using the work of his predecessors. Whatever the originality of his research, a good part of his achievement is bound to refer to

some tradition. This is our challenge today.

How can the historical adobe sites, their conservation, their management, their enhancement and their coexistence with present-day human settlements be of use to millions of people and their habitats? How can co-operation between Turkmenistan and Peru, Mali and Yemen, break existing technological dependence on developed nations? There are no easy answers. Much depends on the dialogue between cultures and technologies. Exchange of information is needed across the globe.

JOYA DE CERÉN

THE JOYA DE CERÉN Archaeological Site stands 30 km north-east of the capital city of San Salvador (El Salvador). The monument represents a community which, at the height of its development, was buried by repeated volcanic eruptions. It consequently offers the most detailed record of the daily life of a 1,400-year old Central American Maya village.

First believed to be of recent construction, the ruins of several houses discovered near the village

of Joya de Cerén when ground was cleared to make way for grain storage silos in 1976, turned out to be one of the most exciting adobe archaeological discoveries ever made in the Maya region. Excavations revealed that the buildings were pre-Hispanic households buried under a thick layer of ash when the Caldera volcano suddenly erupted 1,400 years ago. The ashes protected the structures and their contents from the rigours of a tropical climate, and the extraordinarily well-preserved finds have led archaeologists to reconstruct everyday life in ancient times.

The importance of Joya lies in the fact that it was an ordinary seventh-century farming village. Archaeologists were able to reconstruct a fragmented picture of the lives of pre-Hispanic rulers and priests from evidence found at impressive ceremonial centres that show the landscape of the Maya world, but little was known about the lives of their subjects. Excavations undertaken since 1976

Out of 564 cultural sites and 23 mixed properties inscribed on the World Heritage List, almost 20 per cent are built entirely or partly of earth. The percentage is much higher in developing countries.



have revealed the existence of three houses, two of which were wattle and daub constructions while the third was built in adobe. Wooden columns supported the roofs, which were thatched with straw. Built on platforms, these dwellings had doorways, porches, interior patios and niches in the walls that were used for storage.

Agricultural tools, polychrome clay pots, cooking utensils, obsidian knives, painted gourds, carved bones and perforated stones were found inside the houses, which had clearly defined work and rest areas. Traces of maize, beans, chile and palm seeds, oysters and snail shells were recovered, giving archaeologists an idea of the diet of the inhabitants.

The dwellings were surrounded by tiny maize fields, laid out to prevent soil erosion. Irrigation and a crop rotation system also

seem to have been in place at the time of the eruption.

The most important find to date has been the Joya folio, thought to be the remains of a codex, or bark paper book. If this proves to be the case, it would be one of the oldest documents found in the Maya world and the only one ever found *in situ*.

Although no human remains have been found at Joya to date, eye witnesses present when the site was first discovered claim to have seen bodies. Given the magnitude of the volcanic eruption, there is a possibility that further excavations may uncover preserved bodies.

Many of the features which characterize the life patterns of small agricultural communities in Central America today can be found in Joya, frozen in time. The site with its adjacent rural



The houses of the agricultural community preserved under volcanic ash at the archaeological site of Joya de Cerén in El Salvador (left), are built with bahareque or wattle and daub and adobe.

The settlement of Taos in the United States (below and right), built with adobe, is one of the few Pueblo communities to have survived virtually intact (and still in use) to the present day.

communities has indeed become a symbol of identity for the local population and the country in general.

The exposed excavated earthen structures represent a conservation challenge.

To this effect CONICULTURA, El Salvador's Agency for Cultural Heritage, jointly with The Getty Conservation Institute and in consultation with the UNESCO World Heritage Centre, has established a Major Site Management Plan. This initiative raises the basic issue of conservation of earthen materials in a moist tropical climate, and the need for scientific research to gain a better understanding of deterioration mechanisms in order to mitigate their impact.

PUEBLO DE TAOS

PUEBLO DE TAOS is a living adobe settlement. It is among the very few remaining communities in the United States where traditional pre-Columbian architecture has been preserved and maintained to this day. It lies on a plateau between the Sangre de Cristo mountain range and the Rio Grande in a relatively well-



watered area – the Taos Valley. At an altitude of some 2,000 m, it is near the most rugged mountains in New Mexico at the southern end of the Rocky Mountains. It possesses special adobe architectural distinction, for its five-storeyed north house is the largest multi-storeyed pueblo structure still existent and continuously inhabited.

Taos is in complete harmony with its mountainous setting and embodies a perfect symbiotic relation to site life and nature.

The settlement's population increased over the centuries, and because pueblos often grew by accretion over a period of years, no rigid uniformity in room sizes and roof heights prevails here. Yet the norms of traditional building customs, techniques and material – adobe – have resulted in a balanced construction throughout the pueblo complex within the walled area. Some changes have occurred in the prehistoric and pre-

Columbian architectural traditions. European-style windows, doors, corner fireplaces and roof chimneys, have been gradually introduced over the years.

When I visited Taos in the 1990s, I was struck by the fact that the rooms could only be entered by way of wooden ladders leading to roof-top openings. A functional and defence mechanism, the ladders are to this day identical with those used in Bandiagara in the Dogon country of Mali.

In addition to dwellings, Taos has seven *kivas* or ceremonial chambers built underground, in and near the walled area. The privacy of *kiva* societies has preserved them for generations against intrusion by outsiders.

Pueblo de Taos is the most characteristic example of historical continuity. Its preservation is a remarkable accomplishment because, unlike such sites as Oraibi and Acoma in the southwestern United States, it is an

adobe rather than masonry construction. Needless to say, this adobe phenomenon has opened the way for a cohesive community and the preservation of people's social and religious systems reflecting pre-Columbian traditions, as well as their development of agricultural techniques successful in an arid land, which in turn, sets them apart from all other Native American groups in North America.

Most pueblos in New Mexico and Arizona have been abandoned and are in ruins. In contrast, Taos stands as the most significant, historical living settlement. The buildings are now maintained by the tribe in close co-operation with regional and federal authorities. This is a guarantee of preservation and continuity.

The adobe structures survive. Three different periods show that puddled/poured adobe with forms and layers was in use from earliest times. Before the Spanish conquest, adobe bricks were made

in rectangular clay slabs about 5 cm thick. Fingerprints have been discovered in these 800-year old bricks!

Various types of adobe mortar were used. In the post-Spanish period, adobe blocks were made with moulds. Because adobe is soluble, stucco is renewed and walls monitored and rebuilt. These practices continue today at Taos, the oldest and most complete pueblo still inhabited in either Mexico or the USA.

OLD TOWNS OF DJENNÉ

STANDING ON SOME 50 ha (with 42,000 inhabitants), Djenné is one of the oldest known cities in West Africa. It is located on the internal delta of the Niger River in Mali and is built almost entirely of raw earth. Djenné's architecture consists of an indigenous savannah pattern into which salient features of North African Islam have been woven.

Archaeological evidence dates Djenné to the third century BC. By the tenth century, urbanization had developed. Some eighty sites within a radius of 4 km made the city and its vicinity a major commercial centre and a post of long-distance trade routes across the Sahara.

Djenné is known for its unique adobe architecture. Two-storeyed mud buildings and decorated façades give it a unique urban landscape. The present Great Mosque is the world's largest mud construction. It is now 100 years old and oral tradition locates its origins in the ruins of the first mosque, built in the thirteenth century.

Archaeological excavations in 'Djenné-Djeno' reveal evidence of the use of mud bricks in the construction of habitats as early as the eighth century. At present, Djenné has a large reservoir of adobe houses nearly 200 years old.

The spatial distribution of the Djenné quarters has grown traditionally along the occupational lines of its inhabitants. Around the houses of merchants, a network of streets characterize the 'artisans' and their dwellings, interwoven with areas of minor commercial activities and exchanges of agricultural products and fish, each part of the city having its own small port. The urban fabric of Djenné has preserved this occupational space with various types of houses corresponding to the social-economic patterns of daily life.

Djenné is a city of masons and the quality of its mud-brick architecture is directly linked to the craft of these men, organized into a guild called the Barey-ton, unique in Africa, which has survived from generation to generation. With their magical knowledge, hierarchical structure and training of apprentices, master bricklayers create an immense

Adobe-built houses and the mosque of the city of Djenné, Mali. The mud buildings are two storeys high, and the mosque is the largest mud-built structure in the world.



force and expertise for the construction and maintenance of the city's earthen architecture.

Yet the multi-ethnic city and its architecture is facing the danger of decay resulting from the present conditions and future prospects of Djenné. Changes are certainly taking place in the adobe city, both in the urban fabric and the buildings as a whole, with the exception of major monuments such as the Great Mosque, which are meticulously preserved and maintained.

With the foundation of Mopti (100 km to the north) by the French early in the nineteenth century, economic activities shifted, causing an overall economic decline. Elite houses were abandoned or just disappeared.

The population is concerned with preserving their homes against the inclemency of natural and man-made conditions. Inhabitants have thus developed certain methods for the conservation of *banco*, the raw earth. Stabilization with straw, oil and animal excrement has been tried at the local level.

The Ministry of Culture, together with its Cultural Mission in Djenné, the local government and the population – particularly the elderly – have initiated a seven-year restoration project (1996–2003). The aim of the project is the refurbishment of 100 monumental houses (10 per cent of existing stock) with the technical and financial assistance of 1 million euros provided by the Netherlands Government and the National Museum of Ethnology (Rijksmuseum voor Volkenkunde, Leiden) in order to pursue maintenance of the

earthen architecture, sensitization of the local population, training and creation of employment, documentation of architectural drawings for inventory, and promotion of cultural tourism.

CHAN CHAN ARCHAEOLOGICAL ZONE

CHAN CHAN, THE CAPITAL of the Chimu Kingdom between the ninth and fifteenth centuries, is the largest adobe city in the Americas. The site is located in the Moche



Valley, 480 km north of Lima (Peru). Between the foothills of the Andes mountains and overlooking the Pacific Ocean, it covers an area of 36 square km. In its prime it covered 52 square km. Rural areas are now adjacent to what was an immense city with palaces. The site is well known for its wide streets and walled compounds. On average, the streets were between 5 m and 8 m wide, with roads built to bring in the treasures of conquered cities. The massive walls, conceived for both privacy and protection from the coastal winds, were built as high as 10 m. The materials used to create these walls were tapia and brick adobe. Similar materials were

Chan Chan was the capital of the Chimu kingdom in Peru. Below, the central square on the Platform of the Second Sector. Right, the warehouses or colcas, with a decoration on the Second Platform and the southern wall of the Great Ceremonial Square, with a pedestal decorated with figures of otters.



used in most of Chan Chan's architecture. Mud was also used to finish off the outside of dwellings. A pattern of sorts could be traced in the mud.

The centre of the city consisted of ten areas separated by walls, including pyramidal temples, cemeteries, gardens, reservoirs and symmetrically arranged rooms, all

within ten walled citadels, or quadrangles, organized in a broken triangle pattern.

Tombs filled with riches have been found in these quadrangles. Most of the walls are still standing today, attesting to the engineering abilities of the Chimu. The quadrangles were used for living quarters, burial places and

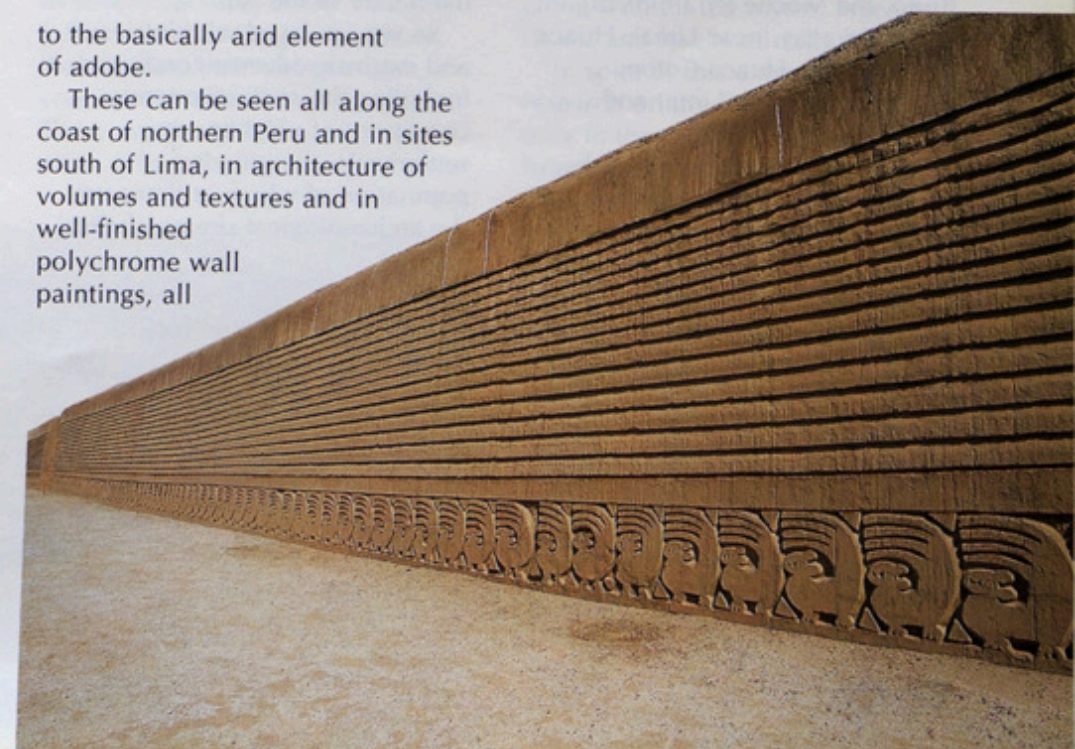
warehouses for the aristocracy. The death of a leader of the Chimu Kingdom caused the palace to be taken over by his kin who were living in one of the broken triangles. Once a new leader was chosen, a new triangle was built. People who did not belong to the aristocracy lived in modest quarters of weaker construction. Chan Chan, like all other pre-Columbian empires, was in essence a theocratic society. Between 1465 and 1470, the Chimu came under Inca rule and the city vanished with the arrival of the Spaniards.

Systematic adobe conservation work, initiated in Chan Chan in

the early 1970s, has given rise to the treatment of major adobe sites on the coast of Peru. These are scattered across what we would call the Desert Kingdoms of Peru – irrigated by waters from the Andes falling to the desert, and periodically affected by El Niño, the warm Pacific current. Near these fertile lands in the desert, a monumental urban settlement developed in the form of complex ceremonial constructions in adobe, with full cities, fortresses, temples and pyramids. In this context, the buildings with religious significance and urban settlements have added two major components, icons and colour,

to the basically arid element of adobe.

These can be seen all along the coast of northern Peru and in sites south of Lima, in architecture of volumes and textures and in well-finished polychrome wall paintings, all



PROJECT TERRA

CRATERRE-EAG, INTERNATIONAL CENTRE FOR EARTH CONSTRUCTION – School of Architecture of Grenoble (France) was set up in 1979. In 1986, it became a research laboratory recognized by the Ministry of Equipment. Since the late 1980s, CRATerre, ICCROM and The Getty Conservation Institute have collaborated on issues relating to earthen architecture conservation. In 1997 they formalized this collaboration with the establishment of Project Terra.

The mission of Project Terra is to foster the development of earthen architecture conservation as a science, a field of study, a professional practice and a social endeavour. Through co-operative activities in the areas of research, education, planning and advocacy, the project members seek to advance the field in a variety of ways.

The UNESCO Chair on 'Earthen Architecture, Building Cultures and Sustainable Development', inaugurated in 1998 and subsequently linked to the 'TERRA Consortium' in 1999, continues to maintain its working objectives. These aim at accelerating the dissemination of scientific and technical knowledge and skills relating to earthen architecture and its conservation within the international community. The international meeting which took place from 3 to 5 October 2001 at the School of Architecture of Grenoble was an integral part of the ongoing progress of the programme. The intention was to bring together both educational institutions already collaborating with the programme, and those which had expressed a clear desire to do so, with the overall aim of drawing up an overview of the current status and future action of earthen architecture education.

(<http://www.craterre.archi.fr/>)

associated with the function of a liturgical space. In relation to the Chan Chan conservation challenge, adobe site works are being undertaken in Sechin, El Brujo, the Moche Pyramids of Luna, Garagay (near Lima), Huaca de los Reyes, Huaca Coton, Pachacamac (near Lima) and Tambo Colorado.

Chan Chan is under attack by environmental agents affecting the adobe architectural structure and

bas-reliefs. The sustainability of the integrity of the site is constantly threatened. The climatic conditions with the rains caused by El Niño cause damage as does the nature of the soil.

So we are faced with intrinsic and extrinsic adverse conditions, including the socio-economic conditions of neighbouring settlements, the growing population of which at times use the archaeological site as 'shelter'.

Earthen heritage is at present seriously threatened by natural and human causes.

This has prompted research and the application of conservation methods to ensure the stability and understand the mechanical behaviour of structural forms and thus find appropriate technologies for restoration and adaptive reuse of adobe monuments.

Right, the impressive earthen Kani-Kombole Mosque in the Land of the Dogons, Mali.

Below, houses with typical conical roofs made from tree trunks and branches in the town of Djuigibombo, also in the Land of the Dogons.

Mud is even extracted to make, of all things, adobe for the poor!

One of the most critical conservation problems with adobe archaeological monuments is the protection of the top part of the walls. The application of well-tested and researched stabilized capping is one solution that has been tested repeatedly in Chan Chan in various forms with some good results.

On a positive note, we can say that thanks to the fact that the site has been on the List of World Heritage in Danger for some time, a Master Plan for the Conservation and Management of Chan Chan was developed four years ago through a joint effort of the Peruvian Institute of Culture, the UNESCO World Heritage Centre, ICCROM, The Getty Conservation Institute and CRATERRE-EAG.

CLIFF OF BANDIAGARA

THE LAND OF THE DOGONS in Mali is one of the main regions in Africa where society, religion, art and architecture are rooted in tradition. Architecture reaches its peak of excellence in the north of the savannah with the dominance of earthen architecture of Islamic



origin combined with animism, and the forest region in the south, where constructions are built from wood. The area inhabited by the Dogon, Dogon-plateau, the Cliff of Bandiagara, is situated in the south-east of Mali, at the border with Burkina Faso. With almost 250,000 inhabitants, the Bandiagara complex constitutes one of the earliest inhabited areas in Africa.

There are more than 1,000 scientific publications on the Dogons in the National Library in Paris. Their social organization, their history and their origins have been researched throughout the twentieth century. There are also full accounts of Dogon traditions, their battles, their struggle and coexistence with the environment. Three topographic features, the cliffs, a large plateau above them,

and the vast sandy plains below, constitute a unique cultural and natural ensemble as part of an intimate relation between the Dogons and their natural environment, welfare and survival along with all the myths, legends, rituals and habits of daily life.

In spite of this extensive research on the Dogons, it was only in the 1980s that studies began to be carried out on Dogon architecture. Traditional Dogon architecture is an excellent example of rational building systems. It has an extremely rich aesthetic adapted to the site, to the climate and to social forms of organization.

Everything should be done to protect the vernacular nature of this architecture. If present tendencies continue in building new forms and styles in view of difficult access to ancient sites and water routes and wood for



EARTHEN ARCHITECTURE PROGRAMME

WHILE CENTRAL ASIA POSSESSES an astonishing diversity of immovable cultural heritage, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan have shown awareness of their respective strengths and weaknesses for appropriately conserving, presenting and managing this heritage.

Consequently, following a specific request by these five Central Asian republics, the UNESCO World Heritage Centre, in co-operation with CRATerre, and within the framework of the World Heritage Committee's Global Strategy, elaborated the CentralAsianEarth 2002–2012 programme to address the frequently inadequate means and technical expertise, orient conservation policies and strengthen capacities.

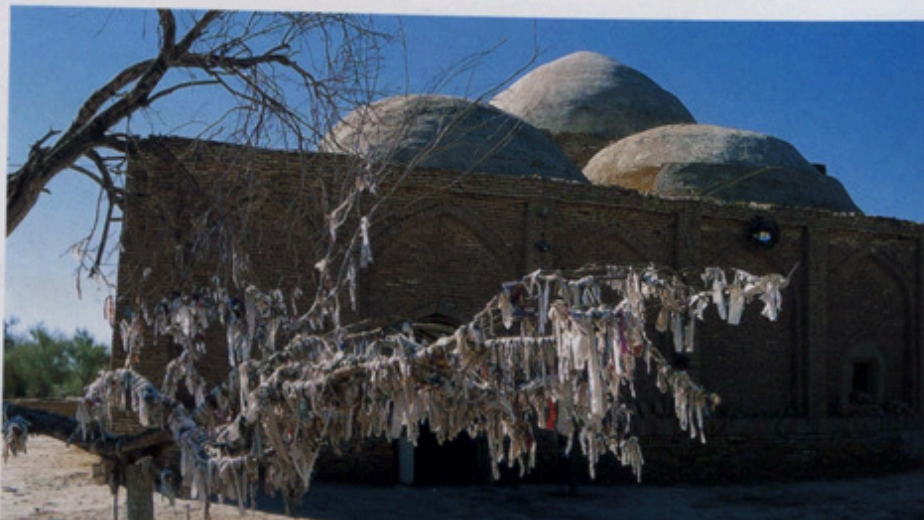
Endorsed by the World Heritage Committee in 2001, the programme first conducted a survey to identify common strengths and weaknesses faced by the national authorities in the conservation, presentation and management of their cultural heritage. In addition, numerous conservation and training activities are being implemented or planned at World Heritage sites and potential sites in the sub-region to raise the capacity at national as well as regional level to address the conservation challenge for earthen architecture.

Also, in the framework of the Earth Programme of the World Heritage Centre, a Regional Seminar on the Conservation of Earthen Structures will be held in Autumn 2003 in Muscat (Oman), with the participation of representatives from all Arab countries. The seminar, which aims at building national capacity on the conservation of this particular category of heritage, is funded and organized by the World Heritage Centre in collaboration with the Omani Ministry of Heritage and Culture, with the scientific co-ordination of CRATerre.

burning, the site may well lose its authenticity and tradition. In the midst of the Dogon heritage, everything has a meaning and needs to be interpreted. Heritage is intimately linked to rites and their symbols.

The Dogon physical heritage clearly has an anthropological dimension in its core and essence. This is a unique example of linkage between tangible and intangible heritage, at present under consideration by UNESCO. There is no separation between the two among the Dogons.

The integral conservation of traditional architecture among the Dogons, requires the heritage site managers (primarily the Ministry of Culture) to establish constant and permanent co-ordination with their



partners from other government agencies, such as regional development, environmental management, social welfare, and tourism and visitation.

This architecture cannot be isolated like an object or a product. To conserve earthen

Below, the complex of the Mausoleum of Mohammed ibn Zayd in Ancient Merv, and, right, at the same site, the Greater Kiz Kala with its characteristic 'corrugated' walls. Below right, children near the Yusuf Hamadani Mosque in this historic enclosure in Turkmenistan.



architecture demands respect for its past and the possibility that its present should remain meaningful.

Conservation management is now gradually falling into place. Yet there are threats to the area including drought and desertification. Uncontrolled tourism is affecting the economic structure and threatening the very foundations of Dogon culture. The savannah vegetation is being degraded by fire and scrub clearance. There is also an urgent need for financial aid.

Thanks to their traditional earthen architecture, the Dogons (together with other population

groups such as the Bamanan and Songhai), have found a solution to the crucial problem of habitat that contrasts with what is happening in Bamako and regional capitals (encroachment of cement, etc.). As in Djenné, there is hope that people may be able to work with earthen architecture or *banco*.

The endogenous technology is there. New infrastructures, including schools, health centres, maternity centres, camping areas and hostels, are needed to introduce young architects to this 'earth' technology, to create building models and systems, both traditional and modern, and suited

to environmental standards just as Hassan Fathy did in Egypt forty years ago.

ANCIENT MERV

THE STATE HISTORICAL and Cultural Park 'Ancient Merv' (Turkmenistan), with its four cities and associated landmarks, constitutes a historical compound with significant developments in architecture, the Seljuk periods and Islamic influence and domination having given rise to a rich urban area. The

monuments made from mud with their ribbed walls are typical examples of Central Asian architecture still in existence. The recent discovery of steel furnaces shows that Merv was once a major technological centre. The adobe structures are still traditional characteristics of the region. Though fragile by nature and vulnerable to the impact of adverse socio-economic and environmental conditions, everything is now being done to preserve this compound which has exerted considerable influence over the civilizations of Central Asia and the Islamic Republic of Iran for four millennia.



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