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Historical earthen architecture and construction in the Mediterranean Region. What future for such an exceptional cultural legacy?

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The historical earthen architectural heritage represents a remarkable cultural significance in the whole of historical resources, as it shows an evident expression of the memory of the builders of humanity, since the most ancient times. Earthen architecture is present on all the continents. Moreover, the building cultures based on the use of raw earth (wattle and daub, adobe, pisé) are omnipresent in the history of Mediterranean civilisation.

Facing the challenge of the conservation and «mise en valeur» of the Mediterranean earthen architectural heritage, we can certainly propose drafting orientations and strategies for the future that would push on the development of integrated activities in the following correlated fields: education (for teaching a discipline), research (for elaborating a specific science), application and situated projects (for developing a professional practice), advocacy (for raising an institutional and public awareness), knowledge basis (for structuring a discipline), and a data base (for more information accessibility). This approach is proposed by the «Project TERRA»[1] jointly developed by CRATerre-EAG, ICCROM and the Getty Conservation Institute.

The proposed communication should briefly present the importance of the historical earthen architectural heritage in the Mediterranean region, its general state of conservation and the paths for developing a cultural management which are proposed in the «TERRA-Med Project».

Historical Earthen architecture in the Mediterranean Region

The primitive periods

The regions of the Mediterranean Levant and of the Taurus-Zagros Arch the unbaked brick was the vector of a fantastic urban development during the IVth and IIIrd millennium B.C. despite this building culture has been emerging since the VIIIth millennium as the famous site of Jericho has testified. At that time, the habitat is settled on hill slopes, both embedded in the thickness of the soil and partially aerial. It is basically oval and round shaped. The walls are erected with a kind of small hand-shaped earthen «breads» which seem to have been built at their plastic state, without any mortar. This technology has been also observed on the site of Mureybet, Syria, where the common people's houses of the VIIth Millenium B. C. are round-shaped, partially embedded in the slopes of the tell, exhibiting small indoor spaces typically organised around a central space. Apart from archaeological sites which are exhibiting remains of entrance gates covered with arches and barrel or inclined vaults built in unbaked bricks, the excavations carried out in the territories of Near Orient have given few examples of the use of vaults or cupolas for the common roofing of vernacular people's houses of ancient times. Some clues of the possible design of these people's houses, during the Assyrian Times, have been given by graffitis which

have been observed on the site of Niniveh. It seems that the conical-shaped vault, or corbelled cupola, might have been used. We could compare the morphology of this design to the shaping of some vernacular houses in actual Syrian villages of the region of Aleppo which are today much more rare but testifying of this legacy tracing back to ancient times.

In Thessaly, Greece, primitive human settlements of the Mediterranean Europe are dated from the mid-VIIth millennium (around 6500 B.C.), tracing back to the protoneolithic phase, so before the apparition of the ceramic. This primitive habitat settled on the border of the Aegean Sea, in the deep layers of Sesklo, show huts presenting variable layouts, lightly buried in the soil. They are constructions made of wooden poles probably supporting walls in wattle and daub (*«torchis»*). The VIth millennium confirms the inputs of the Anatolian and levantine building cultures up to Thessaly, Crete and Cyprus. At the apogee of Sesklo, during the mid-Vth millennium (5500–4400 B.C.), the dwellings of the upper levels are both built in wattle and daub and unbaked bricks. They look much more structured and they adopt the rectangular layout. These houses should have been two slopes roofed and some of them should have been two-storied. Earthen walls are insulated from the humidity by stone basements, as the stone is also used for the defending walls and for some outdoor terraces of the site. However, these houses are still settled as independent farms and they are not really showing a social villager organisation. But, at that time, the basic layout of the habitat is evolving to the «megaron» typology which will predominate in the Ancient Greek architecture: one main room with a hearth slightly embedded in the soil, preceded by an open hall without frontage except a portico supported by one or two massive poles. The same type of habitat has been found at Dimini (South of Sesklo) and will predominate during the Recent Neolithic Ages (4400–3000 B.C.), even if there is an evidence of a hierarchical society which is testified by the existence of some more important dwellings, settled on top of the hills of Sesklo and Dimini.

The Aegean World and the continental Greece

In the Aegean world, the Ancient Bronze Ages (3000–2000 B.C.) which corresponds to the first civilisation of the Cyclades all over the islands, is marked by the development of the construction adopting the apsidal megaron type of layout, mainly built in stone and protected by thick defending walls including oval shaped towers (acropolis of Kalandriani, at Syros, sites of Paros and Melos). On Crete, during the Ancient Minoan (2700 B.C.), at Vasikili, the «house on the hill», with its irregularly designed rooms, seems to announce the future palatial complexes. The earth might have been used, according the «cob» technology, piled up in casings at its plastic state. The larger use of the unbaked brick seems to have colonised the Peloponnese just before the IInd millennium. In the deep layers of Lerne III, the «house with tiles» is erected within a fortified perimeter in the centre of which the American excavators have found this large building (25×12 m) showing a row of 4 rooms (among three of them present corridors). The starting of a stair confirms the existence of a second floor. All the thick wall of this house is erected in unbaked bricks and put up on a stone basement. These walls are plastered with stucco.

During the Middle Bronze Age (2000–1500 B.C.), a very clear fracture can be observed between the continental Greece, which is submitted to Indo-European invasions and a cultural regression, and the Cyclades which seem to face a sudden rise of civilisation. In fact, in the Peloponnese, the Mycenaenan fortifications are increasing. These fortified positions (Mycenae, Tyrinth, and Pylos) are protecting a rural habitat of shepherds, which is settled all around them. This habitat is not well known but seems to have been very precarious and maybe built in both wattle and daub (for inside partitions), and unbaked bricks (for main walling). The «house of the wine merchant», and the «house of the oil merchant», so called by the excavators, describe the characteristic megaron in three parts, inherited from the Thessalian Neolithic, with the *«prothyron»,* or portico with two columns *in antes*, the *«prodomos»,* or small anteroom, and the *«domos»,* or larger room organised around the hearth. But there is no many remains of such habitat, except some smaller villages that are conserving their fortifications built up in unbaked bricks.[2] After the brightening up inputs of the IInd millennium, some have spoken of a «coming back to the degree zero of the architecture». At the same time, the insular context of the Crete is favouring the harmonious development of the Minoan Civilisation. The superb

«lighting palaces» of Knossos, Phaistos and Mallia, invested by the environmental nature, are offering a very refined decoration. An omnipresent light comes in the rooms and cheers up the building materials: the tuff, the gypsum, the schist and the marble which are used for the main walls, the unbaked brick for the partitions or the wood used for the carpentry, the columns and their capitals, the porticos, the door and window frameworks.

On the Greek peninsula, at the Mid-Xth century, in Eubia, the city of Lefkandi seems to have played an important part since the IInd millennium. It has come to light an important structure of monumental character. This is a *Herôon,* an edifice that is consecrated to the cult of a Hero, which might foreshadow the first Greek temples. This apsidal-shaped building of 45 m long, the original walls of which are partially conserved at a height of 1,50 m for some parts, exhibits an unbaked bricks walling put up on a stone basement. The earth was used as bonding mortar. The inside facings were plastered with gypsum. The roof was supported by an axial bearing system of wooden columns in line erected on stone slabs and the pavement was in clay. This elaborated earthen architecture corresponds to a time that someone have called «the second starting of the Greek architecture». In fact the political context of that times (IXth and VIIIth centuries), testifying of a reorganisation in regional states gifted with a relative stability, is favourable to such architectural fulfilment. At Smyrna, architectural restitutions which have been proposed by R.V. Nichols, are showing a typology of habitat, also apsidal-shaped and protected by a thick fortification in unbaked bricks and stony material which is built up behind a cyclopean stone facing. The unbaked bricks are quite big (51 × 30 × 13 cm). Within this protected area of more or less 35000 m^2, oval houses of about 3 × 5 m are settled without any specific order and also built with unbaked bricks of the same size, but not put up on a stone basement nor footings. Their outdoor facings are plastered. During the VIIIth century, the apsidal megaron will evolve to the rectangular shaping and Hellenic settlements will extend up to Sicilia and South Italy (see Incoronato, near Metaponto). The walling building system in unbaked bricks, put up on a basement made of stone or big pebbles bonded with clay mortar, is widely used in the new Italic settlements (Sibari, Amendolara, Heraklea, Velia, Morgantina, Himere) and up to the Iberian peninsula as are testifying the Valencian sites of Vinnaragell and Pena Negra. It is undoubtedly from these coastline sites that the unbaked brick will penetrate up to Catalonia and then to Aragon. At the same time, the Greek architecture is starting a petrifying process, particularly for its religious architecture and the unbaked brick will be more reserved for the megaron-type housing. The Greek domestic architecture will develop later and stayed small, obscure and uncomfortable for a long time. This is only with the coming of Democracy (508–507 B.C., at Athens), that the civil and domestic architecture will present more elaborated principles as like the *«stoa»* (open portico with columns), the Hypostyle room, as the organisation of the rooms around an indoor peristyle. But during the blooming period of Pericles (453–429 B.C.), at the feet of the brightening up Acropolis of Phidias, the popular city is lying down in dense housing neighbourhoods mainly built in unbaked bricks or in post and beam structures filed up with such materials which are thatch-roofed and Athens is looking like a great township. For the best living conditions, these houses are plastered with stucco or painted in bright colours.[3]

Phoenicians and Carthaginians

When the Phoenician, pushed away by Assyrian attacks, will have to transfer its civilisation to the littoral of North Africa, it will call for this technology of the compacted earth in wooden casings, associating it to the unbaked brick, for building the new Punic settlements. The birth of Carthage is taking place around 814–813 B.C. The original settlement that was originally a modest colony called *Qart Hadasht* (*Karchedôn* for the Greek and *Karthago* for the Roman), or «new town», will become a powerful Mediterranean capital with an exceptional destiny. At is *acme*, by the IInd century B.C., its population should have reached about 700 000 inhabitants. During its first stage of development the original township was settled on the slopes of the Hill of Byrsa, configuring a modest acropolis. At its blooming stage, the city was covering about 2000 hectares, including several commercial and military harbours. This Great Carhage laying down in a perimeter of 32 kilometres was protected against threats that should come from the back inside land with an advanced line of fortifications. A twin rampart encircled the city itself.

The French campaigns of excavations carried out on the Hill of Byrsa, by 1974–76, directed by Serge Lancel,[4] are clearly showing that Carthaginians have firstly use the slopes in order to establish a necropolis, the tombs of which being dated from the VIIIth up to the VIth centuries. Then, this necropolis has been embanked to settle a neighbourhood of metalworkers with their forges and workshops. It is only by the beginning of the IInd century that this site has welcomed planned people's housing units, the famous «Hannibal's neighbourhood» and its housing blocks A, C and E which can be visited today. These housing units exhibit a standard layout organising the rooms around a small indoor yard that is accessible by an entrance corridor. As confined spaces for the starting of staircases (probably in wood) are visible, these units might have been two or three-storied high. They have been settled according an orthogonal urban design which looks typically Hellenistic. Today, looking at the houses walling remains of the famous Blocks B and C, along Street II, one can clearly see the eclecticism of the Punic building culture were, the use of the blocking stone masonry cohabits with unbaked brick and *«pisé»* masonry, burn brick elements. This is the typical *«opus mixtum»* or *«opus africanum»* (masonry within structural pillars in stone or burnt bricks) which has been related by the Roman. Only the main façades on the street were built with stones, put up in great bonding. These stones were coming from the Cap Bon, extracted in the quarries of El-Haouaria. After the total destruction of Carthage, the Hill of Byrsa has been totally embanked by the Roman. This huge work was carried out to redesign and level the hill in order to settle the post Roman edifices, including the new Basilica and Forum. For that purpose, to warrant the stability of the new development ground and fond the edifices, the Roman have erected in compacted earth numerous thick footing columns some of them reaching a height of 9 m. These impressive footings in *«pisé»* are still visible.

Italy and southern Gaul

The site of Rome was already occupied during the Bronze Age as the findings of the *Forum Boarium*, dated from 1500–1400 B.C., are testifying. Later, at the beginning of the Iron Age (VIIIth century B.C.), several of the famous seven hills were inhabited as are confirming two Villanovian hamlets which have been excavated on the Palatine. These hamlets seem to have been unified around a kind of common civic centre settled on the actual Forum area. At that time, the habitat is still very primitive. It gathers huts or wooden shanties, rectangular or oval shaped, supported by a central wooden pole and perimetric smaller poles. It is slightly embedded in the soil. The roof might have been in thatch and walls in wattle and daub. In that way, Rome, at the beginning of the VIth century is just an agricultural township when it is influenced by Hellenic inputs which were previously introduced by Greek colonists settling in Campania by 750 B.C., and then transmitted by the Etruscan domination. By that time Central Italy knows a real metamorphosis. The wooden huts, plastered with earth and thatch-roofed of the primitive Rome, are gradually giving place to rectangular houses built in unbaked bricks. Similarly to the first Etrurian temples, the first sacred and public monuments of the Republic (IVth and IIIrd centuries) should have been erected with unbaked bricks and tile roofings gradually replace the thatched roofs. An orthogonal town planning takes the place of the previous modest and disordered settlement. Great rectangular housing blocks, sometimes fortified by an embankment of earth, the *«agger»*, preceded by a large ditch, are erected (see Marzabotto, near Bologna). By the Vth century, Rome extends its domination from the Latium all over the Italian peninsula. New colonies are settled on the base of the fortified camps of the military legions, adopting a regular town planning *(Decumanus and Cardo).* At this epoch of great change, the unbaked brick that was previously the main building material is much more used for the construction of modest people's housing, for indoor partitions and most of the time for filled up post and beam structures. This popular technique of wood and earth construction will be used up to the epoch of Nero (37–68 A.C.) and a lot of housing units have been destroyed during the dramatic fire of the year 64. The same building process has been commonly employed for the construction of numerous new settlements of the Roman colonists when the Empire will extend in actual Europe, particularly in Gaul. So many remains of such building practices have been found on French Gallo-Roman sites, in Lyon, Vienne or Vaison-la-Romaine, in Nîmes, Lattes or Arles. The recent works of the French archaeology carried out on

the Mediterranean regions are confirming a large use on the unbaked brick, but also of the *«pisé»* during these epochs (IIIth to IInd centuries B.C.).[5] On the Celto-Gallic territories, the Iron Age develops a habitat settled in *oppida* gathering small wattle and daub or cob houses. In southern Gaul, on actual territories of Provence, from Languedoc to Roussillon, Hellenic influences are introduced with the creation of the first Greek trading settlements, as *Phocea* (Marseille), *Antipolis* (Antibes), *Agathe* (Agde), *Nikaia* (Nice), and also on the Iberian territories with *Emporion* (Ampurias). This takes place between the VIth and the Vth centuries B.C. By that time, the «civilisation of *oppida*» of the southern Gaul[6] will rapidly adopt the Hellenic inputs and particularly the use of the unbaked brick which will substitute for the wattle and daub construction all over the indigenous settlements of the Gulf of Lion coastline. The evidence of such a change in the building practices is visible on sites as Ruscino, Enserune, La Lagaste or Entremont. Simultaneously, there is a gap between the coastline and inland settlements where the wattle and daub and cob building technology are still predominating. Then a slipping between the earth and stone construction will gradually extend in numerous *oppida* during the IVth and IIIrd centuries.[7]

When Caesar will begin the conquest of Gaul (59–51 B.C.), he observes a local construction where the use of rudimentary building materials is very common. The *«vici»* (rural townships) and the *«aedificia»* that he describes in his *«De Bello Gallico»* might have been undoubtedly built in wattle and daub or cob, evenly in unbaked bricks. In his *«De Bello Civili»,* Cesar gives an other description of the *«murus gallicus»* which is made of earth, stone and wood. At the end of the Ist century, and up to the imperial Ages (in 31 B.C., after the victory of Actium), Rome is in its major part built in unbaked bricks or in post and beam structures filled up with this material. In his «Roman History» (XXXIX, 61), Dion Cassius evokes a rising of the river Tiber that over flooded all low neighbourhoods of Rome and notes that «the houses made of bricks took water from everywhere and collapsed». Nevertheless, the *«lidio», «crudi lateres»* or *«latericus paries»* still remained the building material for the popular housing, beyond the Augustean Ages. As previously observed, Vitruvius[8] was taking the unbaked brick into great consideration, recognising «its greatest utility so long as it does not load the walls too much». He willingly calls for its use «so long as someone building with it should take the necessary care for putting it up correctly». He precises that to build with several floors, the unbaked brick construction should be twin layers bonded *(«paries biplinthius»)* or even three layers bonded *(«paries triplinthius»).* However, after this dramatic flooding of the river Tiber, the use of the unbaked brick was pushed away from the city as soon as building rules were promulgated which prohibited the construction of thick walls, obliging to respect a maximum thickness of one foot and a half (44,3 cm) for all party walls. By that time, for erecting high buildings, the Roman civil builders prefer to use post and beam structures filled up with a blocking masonry of mixed rubble stones and fragments of tiles, reinforced by stone bond beams. By the same time, in his *«Res Rusticae»* (I, 14,4), Varron evokes the *«pisé»* construction as regards as rural fencing walls *(«maceria»)* protecting an agricultural farm located on the Sabine territory. He describes the technique as *«a mixing of earth and gravel which is agglomerated in casings».* He also observes the common use of the unbaked brick *(«lateribus crudis»)* for the construction of such rural fencing walls.

With the coming of the Julio-Claudian Dynasty (Tiberius, Caligula, Claudius and Nero), the tuff, baked bricks and blocking stone rubble-masonry with bonded cut stones or bunt bricks facings, are becoming the main Roman public construction techniques. By 120 A.C., in his *«Augustus»,* evoking the Emperor Augustus, Suetone writes that he has embellished Rome and preserved it from the flooding and firing danger. He writes that Augustus praised himself to have received a town made of unbaked bricks and having left it in marble *(«marmoream se relinquere, quam latericiam accepisset»).* But the popular urban and the rural architecture, as the construction in numerous far-west provinces of the Roman Empire, are going on using the unbaked bricks. In Gaul, the *«pax romana»* will favour an urbanisation pressure around the *«vici»* and other rural townships as well as the construction of numerous *«villae».* As Strabon is observing in his *«Geographia»* (IV, 4,3, and XII, 1, 67), *«Gallics are building large round houses with wooden planks and wattle walling that they are covering with thick thatched roofs».* So,

Tacitus in *«Germania»* (XVI, 3), on the subject of the German housing was noting that *«they do not make use of stones nor tiles; for every building purpose they use raw materials («materia informi») without taking care to any beauty or attractiveness; some parts are more carefully plastered with a so pure and so brightening earth that it imitates the painting and colouring strikes.* Numerous settling sites of the Gallo-Romans *«villae»,* as far as over the actual northern territories of France, in Picardy, that have been identified by the famous aerial archaeology works carried out by Roger Agache and Bruno Bréart,[9] are confirming the existence of basements put up in blocking stone rubble-masonry *(«caementicius paries»)* that should have been heightened with earthen building materials, unbaked bricks, or wood and earth walling whose falling in debris are clearly visible thanks to the colouring variety of the soils showing darken spots attesting of the ancient presence of buildings. The more elaborated *«villae»* have often made a distinction between the use of the earthen building technique, mainly reserved for the *«pars agraria»* (agricultural outbuildings), and stone or burnt brickwork technique for the residential building or *«pars urbana».*

In North African countries, or «Maghreb»

In Tunisia, from the beginning of the Ist century to the IIIrd century A.C., the unbaked brick or *«pisé»* construction was very common in the Province of Byzacena as are testifying excavated dwellings in Acholla, the famous *«House with red columns», «Asinius Rufinus» House» or «Neptune's House»,* which are dated from the reign of Marc-Aurele, or by 170–180 A.C. In «Neptune's House», the *«pisé»* is used for buttressing the pressure of a cistern located in the *«viridarium».* In Uzitta, near Souss, several houses have been excavated showing a common use of earthen structures put up on top of stone basements. It might have been the same in the near Province of Tripolitania. The city of Thysdrus has passed on among the best-conserved testimonies of the public and domestic architecture of those times. In the *«Lucius Verus' House»* and in the *«House with frescos»,* a great number of unbaked brick (50 × 35 × 9 cm) walling, put up on of stone basements built according the *«opus Africanum»* type have been observed. These remains of earthen walls are plastered with a 2 cm thick lime mortar. Again in Thysdrus, the *«House of the death masks»,* which is of Punic type, is built in *«pisé»* with 50 cm thick walls erected on top of a 70 cm high basement made of blocking stony masonry. During the period of Roman occupancy, in Tingitania (Morocco), the construction in earth has been attested on the site of Volubilis, particularly in the *«House with the cistern»* located nearby the North of the triumphal arch. This large dwelling, dated from the IInd century A.C. was covering a private bath of about 150 m^2 that has been dated from the Ist century where «all walls are presenting a stone basement at a variable height, when the elevation was in *«pisé»* or unbaked bricks»[10]. The southern neighbourhood of Volubilis, called in other words the «craftsmen's neighbourhood», or «indigenous neighbourhood», has revealed numerous findings of fit in together houses, gathered in a very dense cluster, all built in unbaked bricks laid on with a clayey mortar on top of 80 cm high basements in stone blocking. The size of the common bricks is 44 × 28 × 8 cm.

The common ancient earthen building cultures legacy in the Mediterranean region

Beyond the Fall of the Roman Empire, the earthern buildings practices will quasi definitively mark the rural and a great part of the urban people's housing construction, particularly over the Mediterranean regions, up to the modern times. This cultural legacy has resisted to the coming back to the dark times of the High Middle Ages (from the Vth to the Xth centuries) that have known a regression to more common and simple building practices. In Italy, where various rural traditions can be still observed; that one of the *«casoni»,* in the *«Friouli»,* or that of the *«pinciaie»* of Abruzzi. But also the *«ladriri»* or *«mattoni»* of the Sardinian *«Campidani»* (from Cagliari to Oristano) which could be certainly connected to the ancient Carthaginian influences. Equally for the Iberian Peninsula. In Spain, region of Catalonia (around Barcelona), where people was still building in «adobe» and in «pisé» *(«tapia»),* only just twenty years ago. Also in *«Tierra de Campos»* (Castilla and Leon, north of Valladolid and Palencia), where a very nice tradition of pigeon towers can be still observed. In Portugal with the similar building culture of *«taipa»,* in the region of Algarve where, closely to the border of Spain, can be still observed

the legacy of the typical *«Al Andalus»* earthen building process which is inherited from the period of occupancy of the Moors: the thick walling built up in *«tapial»* are faced with a raw stonework masonry put up with a lime mortar. In France, the vernacular earthen architectures are a typical feature of the rural landscape in almost all regions of the country. The northern territories are typically concerned by the tradition of the construction in posts and beams *(«colombage»)* filled up with wattle and daub or *«torchis»* as we can observe in Champagne, around the city of Reims. In the south, the Mediterranean legacy of Ancient Greece and Rome, the Carthaginian inputs and more recently the Arabic influences, are particularly evident: «adobe» (unbaked brick) all over the southern territories, from Aquitania to Provence, *«pisé»,* all along the Rhone and Saone River valleys up to the Forez (Auvergne, Central Massif), and in Dauphiné (North of Isere).

WHAT FUTURE FOR SUCH AN EXCEPTIONAL CULTURAL LEGACY?

Just a glance at the mobilisations in Mediterranean countries

All over the occidental Mediterranean countries, the earthen architecture rebirthing movement is in progress. After having welcomed the 7th International Conference on the Conservation and Restoration of Earthen Architecture, «Terra 93», in Silves, Algarve, the *«Dirección Geral de Edificios y Monumentos Nacionais»* (DGEMN, Ministry of Housing) of Portugal has created the *«Escola Nacional de Artes e Oficios Tradicionais»,* institutionalising a *«Programa Pedagogico, Curso de Construçâo Civil Tradicional Construçâo de Terra».* In this school that is training future craftsbuilders and contractors, located in Serpa (Southeast of the country), young people can learn the adobe and *«taipa» («pisé»)* building techniques to use them for the restoration of the national earthen architectural heritage, or for developing a contemporary architecture. Spain begins to worried about the conservation, maintenance and revival of its so nice *«tapial»* heritage located in *«Tierra de Campos»* now exposed to great threats of destruction because of an endemic exodus of the local population to big towns, pushed away by the searching of employment and better living conditions. Italy has organised conferences on this subject in order to promote a national network of specialists. This country counts now on 9 studying groups with university settings, which are dedicated to the research and education covering the field of earthen architecture.[11] In Sardinia, an important programme for the conservation of the traditional architecture of the *«Campidani»,* built in *«ladriri»* («adobe»), has been launched some 10 years ago, which is supported by the regional authorities. In France several regional groups gathering professionals (architects, building contractors, scientists), now attempting to federate their efforts in a national network called «Ecobâtir» (Ecological construction), are developing studies and projects aiming at promoting the conservation of our national earthen architectural heritage and the new construction in earth. Recently, a «Global Contract for Development», supported by the main regional and local territorial communities of the Rhone-Alps Region (Southeast of France), has included in its economical and cultural objectives of development an action entitled «valorisation of the *pisé».* This programme that concerns 46 communes of North Isere has been launched last year and will run up to the year 2005. This movement for a revival of the earthen architectures that took place in the previous quoted countries is now enlarging its impacts and inputs to many other parts of Europe. So were recently created in England (Devon) the *«Out of Earth»* movement, and in Germany (in the *«Die Grünen»* motion), the *«Lehmbau»* network, which are already both very active. Who will stay more out of concern of such an international Renaissance of the Earthen Architecture?

A PROJECT PROPOSAL FOR THE FUTURE OF EARTHEN ARCHITECTURES IN THE MEDITERRANEAN REGION

Summarised projects Background

During the year 1987, the *«5th International experts meeting on the Conservation of Earthen Architecture»*[12] that has been held in Rome, jointly organised by ICCROM and CRATerre, was finally recommended to push on the development of a specific set of institutional activities in this field. These activities should mainly focus on a specialised education and should support the setting up of specialised teaching

programmes in academic institutions. The educational dimension of this project was justified by an evident statement shared by several international organisations: the dramatic lack of professional competencies that should be necessary for conserving a world-wide earthen architectural heritage (archaeological sites and historical buildings) threatened of destruction. In 1989, following this recommendation, a specific project is inaugurated, jointly defined by CRATerre and ICCROM, the *«Project Gaia»*, adopting as main objectives: i) the development of professional training courses; ii) scientific investigations; iii) co-operation projects and, iv) the dissemination of the knowledge. From this time, four international courses on «The Preservation of the Earthen Architectural Heritage» («PAT» Courses) will be successively organised in the School of Architecture of Grenoble (France), in 1989, 1990, 1992 and 1994. Supported by a reflection on the didactics, the pedagogy and the teaching methodologies, this initiative is growing and leads in 1994 to the creation of the *«Project TERRA»* that enlarges the initial partnership of ICCCROM and CRATerre to the Getty Conservation Institute (GCI, Los Angeles, USA). Considering the importance of the strengthening of specialised regional centres, this remodelled project has already realised two *«Pan-American Courses on the Conservation and the Management of Earthen Archaeological and Historical Earthen Architecture»* that have taken place in Peru, in 1996 and 1999. These two courses have given an impulse to the exchanges of experiences among a larger international network of professionals (historians, archaeologists, architectural conservators, architects, cultural site managers) that has been initiated since 1989 with the previous «PAT» Courses organised in France. Since that time, this international network has had several opportunities to be gathered, thanks to successive international conferences that have been hold in USA («Adobe'90», in Las Cruces), in Portugal («Terra'93», in Silves) and in England («Terra 2000», in Torquay). Simultaneously, over the past few years, the *«Project TERRA»*, has given its support to the organisation of several other national conferences or events: in England, Italy, Germany, Czech Republic, favouring the creation of several ICOMOS «Sub-Committees on the Study and Conservation of the Earthen Architecture». The *«Project TERRA»* has also launched and supported several scientific research activities. Among them can be raised up the publication of a first specialised bibliography covering the field, a «Research Index», a «Literature Review», a preliminary reflection aiming at «structuring the discipline of the earthen architecture conservation», and more recently, a fundamental scientific research on the cohesion and the loss of cohesion of the earth material.[13]

The «TERRA-MED» Project

Summarised presentation

The «TERRA-MED» Project aims at applying the operational strategy that has been already tested since 1989 by the «Project Gaia», and then by the «Project TERRA», to the Mediterranean Region. The project is carried out in concordance with the targeted objectives and fields of the EUROMED HERITAGE Programme (for its second phase).

The main objective of the «Project TERRA» is to develop the conservation and the «mise en valeur» of the earthen architectural heritage, through a network of institutional co-operation, leading to activities in the fields of education, research, projects and awareness. All these activities will be supported by a knowledge basis and a data bank.

The large scale of the «TERRA-MED» Project covers all countries of the Mediterranean space testifying of an important earthen architectural heritage and being part of the European Union or associated to the Declaration of Barcelona: Portugal, Spain, France, Italy, Greece, Turkey, Cyprus, Syria, Lebanon, Israel, Palestinian Authority, Jordan, Egypt, Tunisia, Algeria, Morocco.

Conclusion

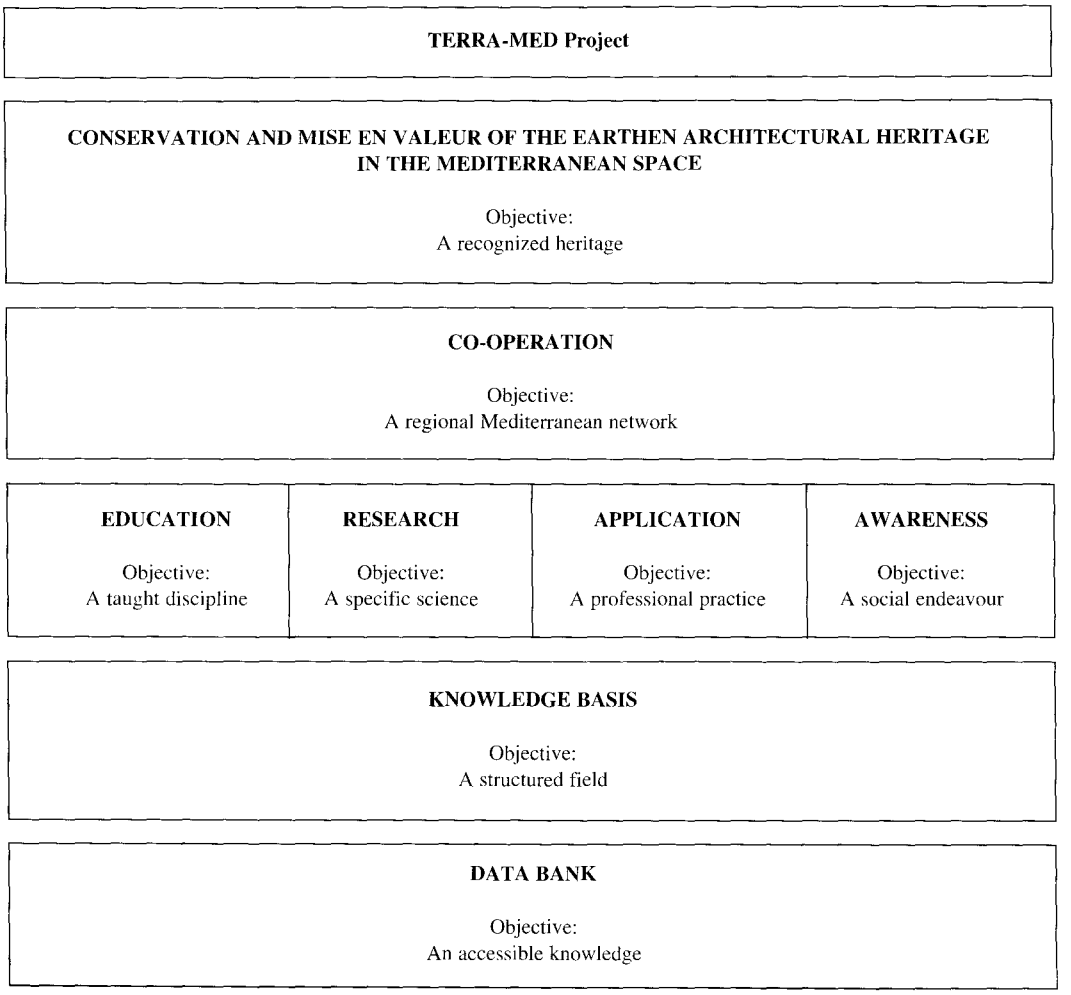
Preserve the techno-diversity: an essential option for tomorrow

For warranting this so-called «sustainable development» —or maybe «post-development»—, the new paradigm of the IIIrd millennium founded on a global alliance aiming at protecting the biodiversity, haven't we the obligation to preserve and pass on the cultural memory which is conveying intangible sense and values that are so indispensable to every

living society? Is not there any alternative for conserving our architectural heritages expressing shared universal values? On such a point of view, the earthen architectures —existing over all continents— should not be essential to this protection and passing on of our inherited cultural, bio and techno-diversity? Might not they offer an alternative to this homogenising building and architectural transculturation that could be devastating? In this way, it should be upon the indissociable triptych «conservation —sustainable development— modernity» that could raise a «vision» for a recreated future of the earthen architectures useful for the coming out of more viable societies generating new specific as diverse equilibriums between «men», their environments and their cultures.

The erosion of the techno-diversity comes under a cultural amnesia, the consequences of which could be dramatic for the worldwide socio-economical system. The preservation and the revival of this techno-diversity are becoming a factor of vitality for the future of the planet. But, considering the challenge for

Project objectives



the coming out of a sustainable development, we have to produce a huge effort for taking stoke of our techno-diversity, for a better knowledge and more understanding of this «building intelligence» and go on updating, enriching our cultural legacy by a more appropriate use of the potential of our technologies. But, there is another danger: to be frozen in an «illusion of the permanence», that is also an untenable «reactionary» attitude. Based on such considerations, the conservation of the earthen architectural heritages, the sustainable development of a scientific research and specialised education in this field, today, are undoubtedly a decisive contribution for tomorrow; this is part of a shared effort —to be developed at the world scale— aiming at reconcile Man and History, and with its cultural diversity that we have now to consider as a paramount option and vector for a «local» development to be balanced with a «global» development. This is a possibility for opening new paths to a «post-development» which could not be only based on the omnipotence of money (profit) and macro-techniques which are generating much more cultural, social and material impoverishment, too much more unacceptable human poverty.

Notes

1. The Project TERRA on the Study and Conservation of Earthen Architectures has been inaugurated in Novembre 1997, following a previous project called the *«Gaia Project»* which was created in 1984 by CRATerre-EAG and ICCROM.
2. According a description written by May Veber, *«Mycènes, creuset tumultueux de l'Hellade»*, 1980.
3. According the historian, geopgrapher and philosopher Dicearque (347–285 BC), quoted by Lewis Mumford in his *«La Cité à travers l'Histoire»*, ed. le Seuil, Paris, 1964.
4. Lancel, Serge, *«Byrsa I» and «Byrsa II»*, Mission archéologique française à Carthage, rapports préliminaires des fouilles (1974–1976 and 1977–1978), vol. 41, ed. De Boccard, Rome and Paris, 1979 and 1982, respectively, 381 p and 382 ill., 417 p. and 613 ill.
5. See Desbat, Armand, *«La région de Lyon et de Vienne»*, (The region of Lyon and Vienne), in DAF (Documentation of the French Archaeology) n° 2, *«Architectures de terre et de bois»* (Earth and wood architecture), 1985.
6. 277 units of *oppida* have been identified in the Var, more then 300 in the Alps of High Provence and more than 200 in the Gard, all actual territories of southern France.
7. Fiches, Jean-Luc, *«Habitat et fortifications, la civilisation des oppida»* (Habitat and fortifications, the civilisation of oppida), in Archaeologia n° 35, June 1979, pp. 67–75.
8. Vitruvius, *«De Architectura»*, Livre I, 3, 8, and Livre II,3, translation by Claude Perrault, ed. J. B. Coignard, Paris, 1674.
9. Agache, Roger and Bréart, Bruno, *«La terre crue dans les constructions traditionnelles»* (The unbaked earth in traditional constructions), in dossiers histoire et archéologie n° 79, Dec. 1983, Jan. 1984 (pp. 16–23).
10. Slim, Hedi, *«La Tunisie»*, in DAF n° 2, op.cit., note 29, pp. 35–45.
11. These groups are set in the universities of Torino, Milano, Genova, Udine, Venecia, Firenze, Macerata, Pescara and Cagliari
12. This meeting was following previous scientific events covering the topic: in November 1972, Yazd, Iran, *«First International Conference on the Conservation of Monuments built in Unbaked bricks»;* in March 1976, still in Yazd, *«Second International Symposium on the Conservation of Monuments built in Unbaked bricks»;* in October 1977, Santa Fe, USA, *«Working Session on the Adobe Preservation»;* in September-October 1980, Ankara, Turkey, *«Third International Symposium on the Earthen brick (adobe) Preservation»*.
13. See: *«projet Gaia project»*, *«Bibliography on the Preservation Restoration and Rehabilitation of Earthen Architecture»*, ed. CRATerre-EAG-ICCROM, Rome, Italy, 1993, 136 p. (900 documentary references). The *«Research Index»* has been published by the *«Project TERRA»*. Based on a wide survey carried out close to architectural conservation professionals, it precises the main scientific research directions for the next years, according the professionals' needs and expectations. The *«Literature Review»*, prepared and draftly written by CRATerre-EAG (Arch. H. Guillaud), and then revised by a corpus of North American and European scientists covering various fields of research, will be published by the GCI late 2002. The research on the cohesion and loss of cohesion of the earth material is driven by CRATerre-EAG (Eng. Hugo Houben), in partnership with GCI and ICCROM Research Units and several other Research laboratories and Units of French universities-UMR-CNRS.
14. This communication is integrating contributions of other researchers of CRATerre-EAG, particularly for the last part dealing with the presentation of the «TERRA-MED Project». We particularly raise up here, as main contributors: Eng. Hugo HOUBEN and Arch. Eng. Marina TRAPPENIERS.

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