The end of the glaciations of Würm, the great Flood of which all the ancestral traditions bear the scar, enters a life of stability and water is directly connected to the continuation of the human occupation of the natural environment and, as a result, architecture.

The hypothesis of paleoclimatologist William Ruddiman shows that climatic cycles that describe the effects of the periodical variations of the earth’s movement on glaciations and the earth’s climate, have been affected by the presence of humans, particularly by the development of farming. It was the discovery of farming that gave rise to a sequence of micro climatic changes, triggering the mechanism leading to the consequences that we see today. The birth of the concept of design began with farming.

Humans created a new artificial environment - to their need and benefit - where they could grow plants and breed animals. The view that had to this point characterised the history of humankind was suddenly shaken up: the inseparability of the human world with the natural and animal world. Humans could now be considered to be in a different and dominant position compared to other creatures: they chose the species suitable for cultivation and breeding, they prepared the land by deforestation and procuring water, they transformed the inanimate world of the landscape, the shape of places, with method and constancy. The adventurous duty of “forcing nature” began, which in religion is sometimes considered a title of superiority or a transgression to atone.

Humans began to live close to the water or else, they had to transport water or dig down into the earth to bring the water closer to them. For this reason, in the pre-industrial age, they needed to exploit the forces of nature, gravity and pressure, in order to transport the water closer to their places of residence and towards the farms. It was the range of the aqueducts, the capacity of the qanāt, the richness and depth of the artisan aquifers, which would determine the location of human settlements and the quantity of food that it was possible to cultivate and harvest in any given territory. The sacredness of water, springs and rivers found in all cultures is the result of how important they are for life. “Water, according to Thales of Miletus, would be the start of all things and the community of humankind” points out Leon Battista Alberti in Book X of De re aedificatoria where he analyses the virtues, the potential and the dangers linked to water, and that without water everything we know in the world would disappear. Alberti adds that dignified Spartan kings were given the right to have a section of water on the doorstep of their house: “this demonstrates just how much consideration was given to water by our ancestors”.

It is clear that water and architecture go hand in hand and that this relationship has to be managed with care and attention.
In the age of necessary sustainability, architecture is the collective discipline of assuming responsibility for the physical care, for the defence of architecture, interpreting the results and causes of transformation phenomena.

Care means being interested in something, participating in it in an emotional way and without requiring something in return, caring about the needs of others, being collectively concerned about something. Care is a term that carries the meaning of planning, calculating, predicting and planning towards the future to improve the present. To care is an action that constantly evolves. We care or worry about the future so that we do not miss out on any opportunity that was given to us in the past. Care is a technique of immanence.

In Islamic culture, humans have to care for the world as if it were a garden. The flow of divine Grace, the barakah, has at its base nature represented as a global garden where the hand of the Creator is always visible, it is His mirror, and humans are the temporary guardians. It is a culture of parsimony, of the conscious use of resources, hardened by the arid climate and the lack of water and unfolds within social solidarity and a group conscience.

Care for water, for its hydrological cycle, can be a way to measure sustainable activity. We are aware of the fragility of humans in relation to the rhythm of nature; humans and nature have two separate rhythms that we perceive now as increasingly compromised due to the unstoppable progress of technology.

Angkor, the enormous city of water, capital of the Khmer kingdom, is an individual episode which should be used as reference in the race, and the defeat, of humans to compete with the cyclical phenomena of the climate and the natural landscape. In Cambodia, the concept of the mandala materialises on an urban and topographic scale, beyond the extreme threshold of visual perception. Vāstu Śāstra is the ancient Indian system of rules for design and construction and it aspires to establish a balanced relationship between Shape and Energy, in order to create harmonic and organic living conditions, where the forces of nature and the lives of human beings are balanced and in peace with one another.

In the Veda, Purana and Agama cultures, the microcosm and macrocosm are reflections of each other, they influence each other and they follow the same path with the same destination. This thought echoes within a millennia-old tradition where the forces of the earth, the movement of the sun and its rays, the multiple rotations and oscillations on the earth’s axis, the water cycles and the direction of winds, the influx of the earth’s magnetism and nature in general become an integral and determining part of the rules of design. Just as the Prana, vital energy, flows inside our bodies in Yoga, the Vāstu Śāstra is the way to act to direct the Prana into the building.

Mandala, meaning shape, vital cycle, represents a psycho-cosmogram and Vatsu-Purusha, Place, Being, is the spirit of the place, the Being of the Vastu, which unifies the Environment, Energy and the Horoscope giving a total balance; it is a permanent shape set in a reality that is presumed to be unstable and unwilling. The concept thus defined covers any type of object, from the hermit’s shelter to the temple, the city, the territory which is recognised as a subject of the celestial law. In reference to this dependency, the many examples of concrete shapes is never thinned out or standardised.

On the architectural scale, the potential universality of the mandala is nearly translated into practice by an immense multitude of variations. The architectural tradition of India takes on the characteristics of a widely pronounced classicism which can be found in Ceylon, Burma, Indo-China, Indonesia: the variegated block that the Europeans called "the Indies" in the 15th century. The earlier concepts were perhaps the settlements of the Gange-Delta, the monasteries of Paharpur or Shalban from the 8th century, today Bangladesh, from where the expeditions towards the East would begin by land or by sea. The dagoba of Ceylon, at Anurādhapura and Polonnaruwa, the 10,000 temples of the Pagan plain, in Burma, Sukhothai in Thailand, My Son in Viet Nam, interpret and vary the Indian conceptual model in the most surprising way, just like the Candi Borobudur in Indonesia.

Borobudur (8th century) today rises up on any opportunity that was given to us in the past. Care is a technique of immanence.

notes
from the densely populated countryside of the Javanese Garden, an entirely designed area, symbol of a cultivated environmental and water culture near Yogyakarta, in Central Java.

The Candi Borobudur monument is an artificial mountain which is approximately 34 metres tall in the Kedu plain where there are other temples aligned with it, and is today surrounded by a landscape of rice fields and a community of villages each specialising in a different material and intellectual production, ranging from the production of tofu (Tanjungsari) to ceramics (Tuksongo), but also one specialising in language (Ngargogondo), perhaps the legacy of the ancient widespread and sectorial colonisation of the plain.

Borobudur was on an island or more probably on a peninsula overlooking a lake. The square-shaped temple mountain, with a side of 113 metres, was reflected in the water. The geometric and dimensional limitations of the mandala is required to compare it with the dwellings. The different duration alone provides an absolute distinction between the sacred and the profane and sacrifices the idea of the city to a sense of unbridgeable disparity between heaven and earth, but at the same time it designs a landscape of life, between water and the earth, which is something entirely new and unusual.

Borobudur, in Indonesia, precedes the experience of Angkor, in Cambodia, and the relationships and similarities are obvious.

The economy of the Khmer kingdom between the 9th and 13th centuries was based on the intensive cultivation of rice on the plain of the Mekong River. Angkor, from the Sanskrit nagari, pronounced nakor, literally “city”, is located not far from Tonlé Sap, the great lake which floods with the return of the Mekong River. During the monsoon season of the south-east, the river cannot flow into the sea and creates a wave that flows upstream once again. The upstream wave follows the current along thousands of kilometres and seasonally multiplies the surface of the lake by nearly 7 times. The Bon Om Tuk, the festival of water, is still celebrated today to recognise the floodwaters changing direction towards the sea, the “reversal of the waters”.

To dominate this particular water and climatic phenomena, the Khmer designers’ idea was to build great artificial basins surrounded by high embankments, baray, which contain and manage the flow of the water and can provide water throughout the entire year.

Their conformation, on a uniform slope from north to south with one very long side resting on a contour line and the other side raised approximately 12 metres from ground level, is necessary to store the water reservoir required to irrigate the downstream cultivations.

The complex water system, a vast network of canals, embankments, moats, distribution drains and reserve basins, provided water to the city and its vast suburbs; an extended and widespread urbanisation of low intensity with an estimated population of 750,000 people.

The monumental complexes denote the many service centres of a population spread out over a large territory which would have been inside the mind of the geographical mandala.

The architectural invention was to incorporate the baray into the city’s landscape. The capital, Angkor, has two colossal baray; 2.2 by 8 kilometres to the west, Western Baray, and the Yasodhararatāka, Eastern Baray, 1.8 by 7.5 kilometres, to the east, with the East Mebon temple island in the centre which is the only construction for which we know the name of the architect: Kavindrarimathana. The third is Jayatāka, 3 kilometres by 900 metres, which supplied the Preah Khan complex, with the temple island of Neak Pean in the centre, where the stretches of water are located on many platform levels of the water temple. The fourth great baray of Indratatāka, 3.8 kilometres by 900 metres, irrigated the plain of the city of Hariharālāya, with the group of Roluos temples, 12 kilometres to the south of Angkor.

The baray would collect the rivers and the monsoon rains upstream and would feed a canal network downstream, which in turn were very large, with the widths ranging from 50 to 100 metres, to divide the various zones of the city and identify the relevant areas of the temple mountain islands. The overwhelming obstruction of the baray meant that a constant direction had to be maintained and the city...
became an immense combination of fences, approximately 25 by 10 kilometres that used the “temple mountains” as geometric centres and points of perspectives. The temples then lost their feature as singular constructions; they connected to one another and organised themselves into a magnitude of sequences. The water, a resource collected for agricultural irrigation, was also symbolic; it became a defence system populated by crocodiles and an architectural feature that multiplied the length of the views, like the European parks of the 17th and 18th centuries. Some temples were reflected in the water along the baray, and the baray themselves were treated as architectural pieces that characterised the city of water.

We can imagine the geometry of the urban area extended as far as the eye can see from the grid of surrounding rice fields, within the complex network of canals and embankments, channelled in the same direction to provide water. This extraordinary scene was not to last. The complexity of the water settlement system made it rigid and fragile against any change.

The droughts caused by the Niño effect, the warm climate phase, and the Niña effect, the cold phase, of the first half of the 14th century and the 15th century, a problem already noted by Maurice Glaize in 1944, are today documented and puts the regulatory efforts of the Khmer engineers into crisis. It was impossible to stop the reservoirs from silting up and the productive impoverishment left the kingdom open to invasions by surrounding enemies. The Khmer cities were abandoned in the 15th century, excavated and reassembled later by the French archaeologists of Henri Marchal. André Malraux, a prominent figure, stole some bas-reliefs from the temple and following this, the cities were abandoned once again during World War I and II, weakened once again by the troops of the Khmer Rouge of the Brother Number 1. Perhaps the tumultuous return of mass tourism will definitively change this daring, but unsuccessful, human attempt.

For six centuries, the city of water was functional but it was defeated by a meteorological and climatic event. The architecture and engineering of a centralised hierarchical society were the victim and they succumbed. The case of Angkor is not unique and its climatic collapse gives it something in common with the fate of other urban agglomerates; the studies conducted by archaeologists and climate physicians show the close relationship between the crisis of ancient civilisations and climate change, phenomena that together form a collection of human and natural causes.

The climatic collapse is documented in the fertile crescent of Akkadian Mesopotamia, in the arid canyons in the south west of USA, inhabited by the Anazazi peoples, in the equatorial forests of Central America, the land of the Maya culture, in the desert coast of north Peru where the Huacas of the Moche were located and in the Andes, on the banks of Lake Titicaca in Tiwanaku.

The most recent knowledge learnt about the climate catastrophes of the water civilisations bring to light the classic studies of Karl August Wittfogel. Wittfogel had noted the birth of centralised and organised power, and its physical translation into the construction of cities or in realising grand widespread urban sprays had developed in the water societies, in Egypt, Mesopotamia, India, China and in the pre-Columbian cultures of Mexico and Peru, where survival revolved around the conscious use of water and required very large coordinated efforts.

Strangled, the great water cultures, efficient in transforming a given environment, were in reality very fragile and did not give working responses to dynamic climate change, despite their technical skills. The organised and centralised power, regardless of how sophisticated it was, was not able to adapt and was not resilient to the changing conditions of the physical environment.

The past gives us two disturbing examples and sincere doubts on the real ability of humans to respond to such structural changes, whether they be caused by cyclical phenomena of nature or caused and multiplied by the irrational behaviour of complex human societies.

Angkor, in Asia, has its twin city in Europe: Venice. They are the two largest cities of the Middle Ages of their respective continents and they are two water cities, a reference for vast territories. The difference, to our
The physical balance was linked to the domestic political interests of the city-state, the connection point between the Stato da Tera (Land State) and the Stato da Màr (Sea State), and its impregnable nature, which would see their demise after the Treaty of Campo Formio. Care, the collective interest politically invested in the Republic, was then subject to international interests that led the territory and the city of water to breaking point.

The distance between the domestic and international interests in the geography of the amphibian lagoon territory, the bio-region with Venice at the centre, clearly shows that the system of Care is complex, involving inhabitants, cultures and traditional customs, obliging us and pushing us towards collective responsibility in the use of territorial transformation techniques.

A continual territorial planning enterprise, based on the coordinated work of a regional community, is put to the test when international interests become more important, corroding the domestic coordinated efforts. The particular nature of Venice as a city of water cannot survive integration with the international world. This risk, already run in the past and only partially curbed by “conservation policies”, is faced today with a new and very big problem, added to the wrong thinking of the recent past: that of the unrelenting and proven change in the planet’s environmental climate.

The amphibian water territory, even if it were “maintained”, would find itself in crisis due to the conditions changing all around it, for which it was not designed or planned. This territory must face up to long-term forecasts and dynamic needs, which do not offer any certainties to grasp hold of, and which must be responded to with flexible sustainable adaptation strategies which aim to solve this condition conceptually and practically.

Care should be deferred and projected towards an uncertain future that opens up different scenarios and the direct consequence falls on the decision-making systems and the design techniques. The challenges of tomorrow involve updating the environment, conserving the history of the Western world and designing new tropical cities, where the majority of the planet’s urban population will be concentrated and which may grow out of proportion in the near future. Over the next two decades, the cities of developing countries will absorb 95% of the planet’s urban expansion, places where water supply is decisive.

The problem of the relationship between architecture, resources, the water system and climate change, becomes essential. The examples of Venice, Angkor and the water civilisations show that care must be flexible and must adapt, they must be

enlarged to scale and mentally embrace a planet which must, and continue to be, inhabitable.

A new way of feeling and new technical skills are essential. Education on prudence is required, the near phrónesis, the virtue of the right action, the practical wisdom of Aristotle that overcomes the technical knowledge and “looks to improve the assets made by humans by calculation” 22. Architecture takes on (perhaps even once again) a new founding ethical value and is responsible for the different trust-based relationship between human actions and nature and can be summarised in the saying “you must, therefore you do, therefore you can”. 23 This responsibility, a public ethic based on prudence and conservation, unfolds across a long period of time. The care to be taken today for “future generations” has value, which is one of the theories underlying sustainability policies. It means perhaps sacrificing something of the present in view of the possibilities of the future and has to move from “the ecstasy of ever increasing needs and satisfying them without limit” to return to “a level that is compatible with the environment” 24. Perhaps the Annunciation of catastrophe tells us not only that order was disturbed 25, but also that order wants, and will always want, to be re-established.

21. UN-HABITAT's State of the World's Cities Report 2006/7 - SOWC/06/07/B/Urb1
24. Hans Jonas, Sull'orlo dell'abisso, Conversazioni sul rapporto tra uomo e natura, edited by Paolo Becchi, Turin, 2000, Einaudi, pag. 4