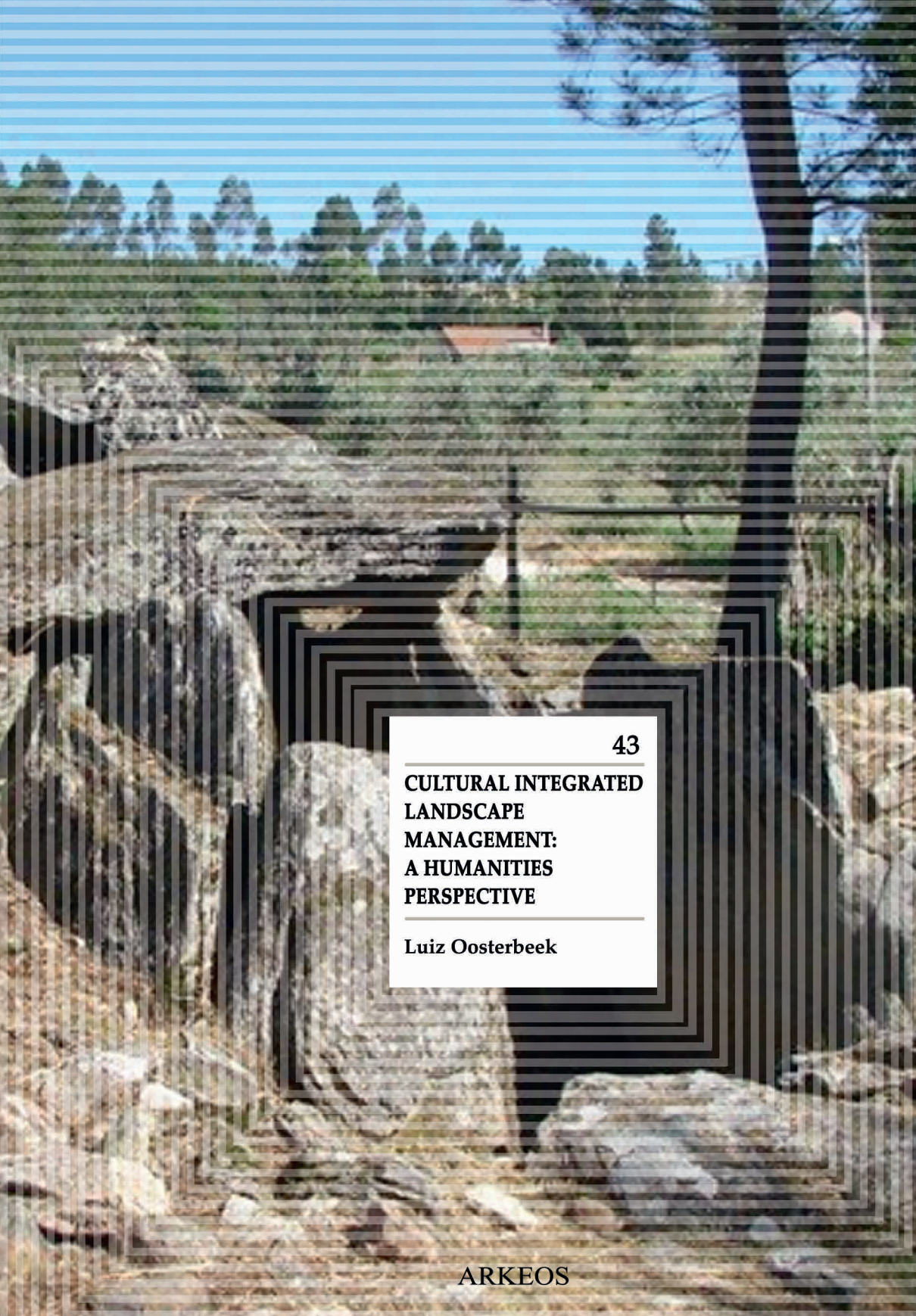

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CULTURAL INTEGRATED LANDSCAPE MANAGEMENT: A HUMANITIES PERSPECTIVE

Luiz Oosterbeek

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Preface

Luiz Oosterbeek's reflections on the so-denominated "sustainability" have long been around, perhaps even before the term fell into the public domain. His choice to graduate in history with a doctorate in archaeology are indicative of his interest and, most of all, of his understanding that the central actor in the process of defining sustainability is man and his interrelationship with the space where he lives and with the time in which he lives.

He understood and knows how to experience archaeology as a powerful instrument that allows to extract information which, placed in the scenario of the imbricated knowledge of multiple sciences, leads to the understanding that the territory is the transdisciplinary stage of reality, unison but not monotonic, in which life, individually and collectively, takes place. The multiple publications he produced and produces show his reflections, his researches, his experiences, his capacity to understand the inseparability of the local from the global, his leadership in multiple projects that, in turn, unfolds the transdisciplinary archaeology in multiple sciences, areas of knowledge and skills such as history, geography, heritage, culture, education, applied legislation, logistics, communication, territory management, and comes back to converge in a web that reflects the inseparability of reality.

This present book - Cultural Integrated Landscape Management: a humanities perspective - begins by allowing us to understand his consideration for thinkers and philosophers, from the ancient Greeks to the contemporaries, to such a point that it establishes a discussion with the written legacy they left, in an almost didactic sequence, that leads us through the historical advances and returns of thought about culture, society, territory.

In the seven titles that make up the book, he puts us face to face with the past, with the present time and with our absolute uncertainty about the future. He shows us the possible reasons for our near stupefaction and paralysis in understanding what is happening, what is surrounding us and our total insecurity about future scenarios. Oosterbeek´s analyses make us realize why the many global conferences dealing with the humanities´ common challenges are not translated into effective measures that could be applied both for present and anticipated ailments for the future. He shows us how archaeology, through its transdisciplinarity characteristic, is crucial to uncovering the complexity of the territories' history and to highlight culture as the amalgamating factor between the environment, societies, economy, space and time, as well as how memory and cultural heritage can be the foundation for the guiding thread of the history of future.

The book dedicates an analysis on the model of science and education we adopted, showing us the dissociation generated between Science and Humanities which got emptied of meaning and importance and, also, makes us reflect on the divorce between the theories in which we shelter ourselves and our practices, as well as on the results that have arisen and are felt in the economy and in the global governance, among other areas. It also brings up the subject of anti-science in an era where science and technology seem to be the tonic. It also discusses how legislation generated from the proposals of sustainability and the difficulties in elaborating one that embraces the premise of a broad meaning of sustainability but, at the same time, needs to deal with the various components of reality in the territories, in connexion with the people perception of environmental and heritage.

Luiz Oosterbeek shows his confidence in the future by recognizing the importance of global initiatives that place the humanities, and in particular culture and

multiculturalism, at the centre of the process, in order to create a new thinking and attitudes to enable a balanced future and, above all, a path to global Peace.

Finally, he brings together his reflections on Cultural Integrated Landscape Management as a pathway that provides the tools to construct and support sustainability, in which the systemic approach of reality admits the multiple landscapes created by our different perceptions, in which the dilemmas constitute fuel to propel towards the equilibrium between environment, economy and society, which lose their limits by the introduction of culture as an amalgam.

It is not only a book to be read by those who seek to understand the present time and look for nuances about a future that they cannot foresee, but also as reference work in sustainability studies as theoretical knowledge, as a transdisciplinary analysis, as historical-spatial-temporal support and as an application in territory intervention projects.

Inguelore Scheunemann

Foreword

For the last over 15 years, researchers and policy makers from several countries have been working with IPT on a new approach to landscape management. The foundations of this new approach were set in 2001, during a conference on Integrated Landscape Management. The starting reflexion was that, despite wide endorsement of Eco 92 resolutions, and the advances on its institutional implementation (setting ministries for the environment, agenda 21, etc.), the reality of the planet was getting worse. This reflexion let to identify a theoretical error in the so-called "Tripple bottom line" model of sustainable development (issued from the Brundtland Commission) and to foster a new framework of reference that was presented in Rio+20, already supported by several applied projects.

These efforts converged with another initiative, emerging from the International Geographic Union on the initiative of Benno Werlen, to promote an International Year of Global Understanding. This has proven to be a very solid and efficient approach to bridge the gap between people's local perceptions and the global implications of human behaviour, given its strategy to promote evidence from daily life basic contexts, related to dwelling, eating, moving, etc.

From 2014, these two initiatives were brought together through a strategic partnership on Cultural Integrated Landscape Management (www.apheleiaproject.org), coordinated by IPT with the support of the European Commission (Erasmus + programme) and having, among others, the collaboration of the Inter-municipal Community of the Middle Tagus (CIMT), and taking some territories, as the Municipality of Mação (engaging all its stakeholders, together with the town hall, the local Polytechnic Studies Centre and the Geosciences Centre of Coimbra University, of which IPT is a member) as pioneer projects. This partnership, Apheleia, became itself a very influential cluster, obtaining collaboration of the UNESCO (MOST programme) and interacting with ongoing initiatives of the International Council for the Philosophy and Human Sciences, the UNESCO project on sustainability science, and beyond. One important outcome of this activity has been the recognition of Mação, where the project is based, as a member of UNESCO's Global Learning Cities Network (http://learningcities.uil.unesco.org/).

Currently, two important developments are being set. On the one hand, the Apheleia project became a formal lasting network and an European regional partner of the International Council for the Philosophy and Human Sciences. On the other, IPT has proposed a new UNESCO chair, endorsed by the CIPSH, encompassing all the above stated activities and networks, named "Humanities and Cultural Integrated Landscape Management". This is expected to consolidate a new international Humanities, and includes partners and projects in Europe, America, Africa and Asia. NHRC will be a fundamental partner in this process.

The current volume reunites some texts of the author reflecting on these interactions between the Humanities and the global concerns of human societies governance. The seven chapters move from a debate on the role of the humanities in contemporary society (chapter 1), focusing on archaeology as an epistemological reference for a new methodological and governance framework (chapter 2), through its relations with economy (chapter 3), with inter-cultural processes assessed from an anthropological perspective (chapter 4), and with science (chapter 5), leading towards a new approach to management as a Humanities domain (chapter 6) and a related discussion on its legal implications (chapter 7). The volume concludes with a brief invitation to engage in networking involving different but convergent territorial

concrete cultural integrated landscape management context, as a necessary step to produce a more robust framework of reference, rooted in praxis.

Mação, December 2017

P.S.: The author wishes to express his thanks to the Foundation for Science and Technology in Portugal, for its support to the present research, namely in the context of the strategic project of the Geosciences Centre of Coimbra University (UID/Multi/00073/2013).

Luiz Oosterbeek

One: Is there a role for the Humanities in face of the global warming and social crisis?[1]

(…) entre ces deux sciences qui paraissaient bien séparées, bien disctintes, l'esprit du siècle passé a enfanté de nos jours, sinon une science nouvelle, tout au moins une nouvelle branche des sciences, qui sert de transition, de passage, entre l'histoire et la géologie : c'est la paléoéthnologie, étude des temps préhistoriques.

Gabriel de Mortillet (1882)

If your time to you
Is worth savin'
Then you better start swimmin'
Or you'll sink like a stone
For the times they are a-changin'
Bob Dylan (1964)

What, who and where?

It is well known Marx's concern to shift from "interpreting" towards "changing" the world (Marx 1845). Indeed, the discussion on the role of humanities in contemporary society is already an old one (Foucault 1970, Popper 1993), even if it is only now that awareness on the "crisis" of non-falsifiable knowledge approaches (i.e., non-positive scientific knowledge) became globalised. If one looks back to the period when the world economy based structure was laid, roughly the 16th and 17th centuries, such discussion was beyond reason, since all roles seemed quite clear: while the new emerging natural and so-called exact sciences were setting the foundations of a new era merging rational thinking and techniques (i.e., the technological era), humanities (namely philosophy and anthropology) were generating the new governance strategies while studying cultural diversity (to the benefit of the new colonial empires) and consolidating nation-states. In this progressive cycle at the dawn of capitalism, humanities were about understanding the "other" (Kant 1802), in order to consolidate European dominance ("*comparative studies*") within an evolutionary living hierarchy (of *instincts, manners*), segregating humanities (under philosophy), consolidating Nation-States and securing the moral superiority of the European tradition (the moral *unity* of a male kind).

[1] *This chapter was first published as an article in the Journal of Iberian Archaeology, based on an oral presentation delivered at the Changing Nature - Changing Sciences? organised by ICSS and CIPSH in Nagoya, Japan, the 13-14 December 2010.*

This is a story that came to its climax by the first half of the 19th century, and signs of distress were increasingly perceived since then. Nietzsche's philosophy (1996), socialist ideologies (Owen 1976), or the Christian social ideology (Husslein 1931), have been expressions of this. After a quite "bi-polar" 20th century (oscillating between traumatic and optimist cycles), technology took over the leading role in society, promoting an acceleration of problem-solving approaches, indirectly contributing for an increasingly short-term foresight approach of people (e.g. short term political agendas, growing individualism, diminishing of long term investment, short term speculation and the submission of economy by finances). Discredited by the clash of ideologies and their most negative social consequences, and pressured by the need to foster economic growth within decaying western economies (Oosterbeek 2006), humanities were slowly marginalised.

Today, humanities are not a major concern of public policies, and except for philosophy (or a restricted understanding of what philosophy is about), even international organisations have lost their interest. UNESCO, with its focus on "pedagogy" and "technology" is a clear example of this.

It is for the practitioners of humanities to re-think their role, though, since it would certainly be an absurd approach to blame society for not understanding their usefulness.

There is a global awareness of change, but no global understanding of its meaning and this is of course a result of the contradiction of cultural and social interests in the process. But if we address the question "What is happening?", it is important to look at the current context as part of a long acceleration and changing process (Santos 2007), through which global climate and environment (i.e., the stage where humans perform) are finally met by a global economy: needs, commodities, products and supply mechanisms are no longer national, and become crucially global.

Societies and cultures remain local, national or regional, though, and this generates growing tensions. This relates to a second crucial question: "Who are the actors in the process?". Identities change very fast, adapting to the new global economic logistics, and probably here rests what should be one of the major focus of humanities today: how are these identities being re-shaped, and how can governance solutions be built from them? For instance, while most western concerns are anticipating an Asiatic dominance, one should probably question if Asiatic countries for some magical reason can escape the globalisation process, and consequently be freed from regional disruptions due to the major contradiction between globalisation (environment now reinforced by economy) and particularisms (society and cultures, now abandoned by economy).

Another core question is "where are the changes occurring?". Economics and sociology pay attention to this aspect, and this is probably one of the reasons why social sciences have escaped the oblivion that affects humanities: they found a new focus which addresses a major concern, dealing with specifically located human problems. But whereas geographic unbalances of economic integration

and social divides are being addressed, the more rooted global cultural diversity, and the adaptation mechanisms associated to it, is not being paid enough attention. Yet, it is globalisation of societies and cultures that is now in stake, and that will generate the greater disruptions, and again this should be a focus of interest for humanities.

It is not by accident that despite, as it seems, there is a purpose for humanities in contemporary society, not only society is not paying attention to it, but also academics are failing to convey their messages. Knowledge, and academic knowledge in particular, is not a mere abstract construct, detached from any social dynamics. It occurs, though, that useful humanities knowledge will foster the globalisation of society, i.e., the required new advances in human adaptation, hence entering into conflict with national or regional divides that still govern human societies. To understand this contradiction is a requirement to design a strategy to overcome it. Also, one aspect of globalisation is that knowledge becomes more interconnected, with a stronger inter and transdisciplinary dimension (Max-Neef 2005). Such movement has been made by natural sciences (nano-technologies result from this), and to a certain extent by social sciences, but humanities have still a path to follow, some being more advanced in the process. Archaeology, being an interdisciplinary field shared by human, biological and earth sciences (Oosterbeek 2007, 2010), may play a major role in this process.

Changing times…

Climatic and environmental issues, social inequality, geo-economics shifts, geo-strategic re-orientations…this is the scope of changes affecting both individuals and their institutions, namely the nation-states. The later face a decreasing capacity to respond to increasing people's demands, while approaching the end of the cycle of "national" progressive dynamics, within a multi-centred geo-politics governed by local and regional questioning of old frontiers. What is now occurring in both rives of the Mediterranean, but also in Japan of at the gates of Wall Street, is but an expression of this decay.

The new, post-colonial and post-soviet geo-strategic equilibrium became symbolically inaugurated in 1970 with the end of the dollar-gold parity and the raising of environmental alerts, growing regional conflicts and the transition into a fragmented, unstable, geo-political map that followed.

At the same time, citizens are being entrusted with an increasing power (the popular demonstrations and resulting processes in the Mediterranean are, again, a good example), but at the same time they are subdued to a growing conceptual and technological alienation. This twofold contradictory process is the key problem in the dawn of the 3rd millennium: central leadership diminishes and power is dispersed among increasingly less conceptually equipped people (Oosterbeek 2010).

Despite alienation, which is expressed mainly in the poor mastering of the notions of space, time or causality, there is a growing awareness of the disruption processes in the richer countries, either environmental (great acceleration and global warming), economic

(negative growth) or social (middle class loosing major benefits of the welfare state while emerging nations still strive to cope with great social divides). Within this process, key-words of new perceptions of the territories are energy, terrorism, employment, economic growth, social divides, pollution …

Even if large parts of the planet still experience a significant growth, with immediate consequences on the reduction of poverty or the access of middle classes youngsters to college (Archaeology being favoured by this, as can be seen in countries like Brazil, Chile or China), the global crisis of the financial system threatens such growth, largely dependent upon the consumption in the richer countries (now in decay). The more profound crisis, expressed by an increasingly lower mastering of concepts of time, space o causality, or by a poor rational critical thought, is also perceived in the slower pace of growth of applied knowledge. One major factor that fosters alienation is the fact that contemporary society uses products that do not illustrate production processes, unlike what happened in the past: virtual technologies that prevent sensorial physical experiences and thus do not facilitate the understanding of immanent causal sequences. Simultaneously, there is a loss of knowledge on traditional low energy cost techniques, making the whole society more dependent upon high energy complex producing processes. Catastrophes do occur, though, as archaeologists are well aware of (Djindjian 2010; Oosterbeek 2007). In the past, whenever this happened the survivors went back to the countryside, which was the basic matrix of human settlement strategies, and used low energy cost techniques. But such countryside matrix and traditional knowledge are no longer, radically diminishing the recovery capacity of people in major urban developed centres if they will have to face a stressful situation due to social or natural causes, from energy black-outs to tsunamis.

There is a social requirement to move from awareness to action, but global old neo-colonial responses are not delivering this. An example is the UNESCO focus on technology and training, undermining humanities and fundamental research, since it deprives emerging economies of the possibility to build new, original, cultural and anthropological understandings of the present and future agendas. But how can archaeology and humanities contribute in this sense?

Humanities and Archaeology

Humanities tend to be understood as "interpretation of the world" and "curiosities" (Arnold 2006), …and curiosities may be discarded in times of shortage. The undergoing changes generated new social need and require new responses. While social sciences must focus on convergence and equity when dealing with social issues (since they find their social role in the process of globalisation of society…and this explains the social acceptance of social sciences), humanities must find their usefulness for the enhancement of diversity within a multi-centres world. This means they must go beyond the academia and intervene through practical applications from and for globalization, beyond nations and segregation, portraying moral diversity and converging towards ethics common grounds by intervening in landscape

management. Projects like the management of the new Açu harbour (Oosterbeek/Scheunemann et al. 2010) or of the International Year for Global Understanding (UN 2011) are good examples of this. In fact, landscape management becomes, in a century that will be marked by a fast re-design of territories and territorial competition, a crucial stage for humanities knowledge to be applied in order to monitor and manage various disruption tensions (Oosterbeek/Scheunemann et al. 2011).

Within this, humanities education clustered around territories understanding and conceptual strengthening, will become more relevant not only to prevent ruptures (violence, forced mobility, war) but mainly to enable governance of increasingly culturally diverse regions: globalisation of societies (merging with global economy and environment) will reinforce cultural diversity and potentiate cultural divides, xenophobia and conflicts.

Notions of space, time and causality ate to be built in society through daily praxis, having the territory as the stage of such praxis. Knowing that all our knowledge is human and focused on humans, philosophy, history, philology, anthropology, they all relate to causality, space, time, communication, continuity through change, convergence within diversity.

It is in this sense that humanities are not a section of social sciences and that they are needed as cement for all knowledge and behaviour. They are about understanding how different and even opposed avenues may converge towards single common results, and this is precisely the issue currently in stake in the planet: how can different interests, when considered from the point of view of economy or society, converge?

In 2012 Rio de Janeiro will host the Rio+20 conference, amidst a bitter feeling of failure when thinking back on the aims and expectation of 1992. It is important to understand that such relative failure, despite the positive impact on global awareness, is due to a limitation in the three-bottom line approach: the oblivion of human behaviour diversity (Comissão, 1991). Understanding humans as a link involving society (humans' organisations), environment (humans' context) and economics (human behaviour) enables to understand humanities as a set of expertise for integrated landscape management for sustainable development. A new role for the Humanities is, then, to build critical conceptual capacities, promoting new integrated landscape management plans that value these issues, but also to give coherence to the tripod of sustainability, to bridge the gap with other sciences to rephrase the dichotomy between economics and culture and to promote the didactics of dilemmas and of convergence within diversity.

The specific relevance of archaeology in such a programme for humanities is twofold. On one hand its expertise in assessing adaptation mechanisms, economy-environment balances, techniques and technology (Miranda/Mesenguer et al. 1986). On the other hand, it offers an interdisciplinary approach that goes beyond humanities, involving social and natural sciences when addressing those topics. In fact, archaeology provides in-depth understanding of the relation

between resources and needs, between techniques and energy, or between knowledge and territory. This is how it looks into the past, e.g. when discussing the emergence of space dominance by early hunters, the role space and time notions in the conquest of symmetry, or when assessing the Mediterranean transitions into farming relating resources, climate and human social dynamics.

Archaeological research offers to contemporary society, hence, an integrated insight into past landscapes and their human dynamics, contributing to disseminate awareness of adaptation mechanisms and of the need to value all levels of information.

Two: Dilemmas of archeology in-between society and territory, in a century in which almost nothing will remain as before but nobody knows how it will be in the future[2]

Archaeology within the global system of sciences

"The world is the substrate and the scene in which the game of our aptitude unfolds. He is the soil upon which our knowledge is acquired and applied. But for the realization of what the understanding says to be necessary, it is necessary to know the constitution of the subject, otherwise what is said is impossible.

Moreover, it is necessary to learn to know the totality of the objects of our experience, so that our knowledge does not form an aggregate but a system; for in a system the whole precedes the parts whereas on the contrary, in an aggregate, it is the parts that precede the whole."

Kant [1802]

Archeology, as a multidisciplinary and transdisciplinary field of study, was born in the nineteenth century from three paths: classic antiquarianism, comparativist ethnology, and naturalistic geology (Trigger, 2004).

Some eight centuries earlier, but especially from the epistemological turning point in medieval Christian Europe by St. Thomas Aquinas (resuming the primacy of reason, assumed as a postulate of faith), renewed interest in antiquity and its theoretical and applied, which in turn accompanied the awakening of long-distance commercial life (which was already making the richness of Atlantic coastal villages and, above all, the Italian republics) (Braudel, 1997). This epistemological change reunited the medieval knowledge, until then divided between the Christian and Arab traditions, which means that it reunited the two faces of the philosophical thought: abstraction and empiricism, synthesis and analysis, metaphysics and experimentation (Oosterbeek, 1992). It was the resumption of trade routes and urban dynamics, bringing the two sides of the Mediterranean into contact, but also Asia, which created the de facto conditions for such reunification, of which a direct descendant is the establishment of non-transcendental truth criteria, with William of Ockham - responsible for the first naturalistic definition of a criterion of truth, which already announces renaissance, though still in the medieval context.

[2] *First published in Portuguese, in Campos, Juliano Bitencourt; Zocche, Jairo José; et al. (2014). Arqueologia Iberoamericana e Transatlântica: Arqueologia, Sociedade e Território. Erechim, Editora Habilis press.*

Its principle (known as "Ockham's razor), is still used in science, and in particular in computing, and is especially useful for Archaeology, which sometimes tends to over-complexity the expressions of human behaviour. Descendants of Aquina's thought will also be experimentalism and naturalism as the basis of a new way of knowing and doing, which are announced in Garcia da Horta (botanist, author of Colloquium of Simples and Drugs and Medicinal Things of India, edited in 1563) and Duarte Pacheco Pereira (cosmographer, author of Esmeraldo de Situ Orbis, at the beginning of the 16th century), to be then consolidated with Leonardo da Vinci, and epistemologically organized with Gianbattista Vicco (author of The New Science, edited in 1725, in which he traces a vision of the evolution of civilization that relies on innovation and complexity, not on mere Cartesian rational observation, for what he can be considered the founder of the modern history and of special importance for the genesis of the archeology), Francis Bacon (author of the "New Method" - Novum Organum Scientiarum, - published in 1620, on which he bases the recourse to induction, refunding relativism in the context of modernity, in a line that will continued later by Nietzsche and by some contemporary postmodern philosophy, although the late rarely recognizes this) and Descartes (author of "Discourse on the Method", he is the founder of rationalist science of modernity, in establishing doubt and deduction as its basic tools; many texts attack "Cartesianism" associating it with logical positivism, but this is an abusive reduction - it is important to contextualize Descartes and to understand that in his time, he consolidated a global system of contestation of transcendental explanations, which in this sense overcame the punctual, but fundamental, resistances to do it which were present in Copernicus and especially in Galileo, as well as the plural, and therefore less efficient for the rationalist battle, system of Francis Bacon). When one reads the reference texts of the different currents of Archaeology in the twentieth century, it is still the echoes of this debate that we find.

It is in this cycle that it is important to understand antiquarianism, which on the one hand resumes the taste for the collection of memorable objects for the education of the new generations of elites, and on the other, results from an ideological valorization of a non-immediate past, with the explicit purpose to deny this later one (the medieval knowledge constructed from the dawn of the second millennium, which is purposely associated to "dark ages"). The collections, later the curiosities cabinets, will be associated with an immanent epistemology, and especially with an infinite interest in understanding the material conditions of production of the diversity of the real. But these collections were not yet archeology, because their context was a mythical past, constructed as a literary narrative, without a scientific and consensual basis.

Therefore, the contact of the first explorers of the southern hemisphere, financed with the purpose of better preparing the bases of commercial relations and exploitation of the colonies, will be of great importance, since they have exercised with great rigor the effort of characterization of the territories and the human groups that were being identified. We can recognize in Pero Vaz de Caminha (1500) their modern forerunner, for the attention he puts in the details of the characterization of lands and populations, and even for the decentering

effort that he evidences. Sixteenth-century Europe was well informed about the civilizational complexity of the Far East even if it did not understand it, but knew little or nothing about sub-Saharan Africa, which in the previous centuries had essentially been the scene of a drain of human lives as slave labor, trafficked by Arab networks which, however, barely entered the continent (trading slaves directly with African traffickers of rival peoples). And it knew even less about the Americas, or Australia, for obvious reasons.

Hence, an early effort has been made to characterize these new realities, geophysical and human, often using the comparison. The discussion that then arises about the human or non-human character of these peoples will be of great importance in forging an implicitly evolutionist mentality, since the recognition of behavioral frameworks completely different from all that was known in the Mediterranean or in Asia did not fit in a fixed explanatory matrix, except with the possible identification of a greater proximity of these peoples to the biblical original innocence of humans (that is why Pero Vaz de Caminha considers them better than the Europeans). The comparison will, for cultural, religious and economic purposes, resume the logic of the historical-geographical readings of Antiquity (Herodotus, Strabo, but also Lucretius).

As early as the fifth century BCE, Herodotus was the first to elaborate a chronic, reflexive and problematizing history, in which the territory assumed a fundamental dimension and in which a common trans-Mediterranean logic was envisaged. Five centuries later, Strabo would affirm above all the geographical particularisms, although maintaining the connection with the history. We can thus verify that it is in classical antiquity that the two great explanatory traditions of the relations between society and territory are drawn, which continue in the studies of contemporary Archaeology. And it is also in antiquity that for the first time a technological vision of prehistory (the root of the age classification system, which would be resumed in the nineteenth century) is defined for the first time, with the poem of Lucretius, De rerum natura (The nature of things).

The comparison will reach the refinement of comparing objects and their functionalities, in a unitary and teleological vision of a humanity at various speeds but with a common destiny (which finds its roots in Hegel and is modeled on Lewis Morgan – which would influence F. Engels, 1884). This attention to the functionality of the objects, associated with their morphologies based on the transcontinental comparison, specially elaborated by the Scandinavian ethnologists (with special emphasis on the Oscar Montelius seriations), still translates today in terms like "arrow-head", "scraper" or "axe". Hegel will organize the ternary dialectical model of rational interpretation of reality, in which rationality is affirmed as consubstantial with reality and defends a notion of convergent progress towards an end.

This model is at the basis of human sciences in the twentieth century, in its several variants, despite the criticism of historicism. The book Ancient Society by Lewis Morgan would have a great influence in the transposition of evolutionism into the field of the anthropology. Many terms that we still use in archeology and anthropology were popularized by this author and by his attentive reader, F. Engels. But

these comparative typologies were not yet Archaeology, because they neglected the spatial-temporal context, reduced to an eternal repetition of evolutionary prototypes, without a solid chrono-cultural basis.

Curiously, this double focus on the objects of the past (as memory bearers and as indicators of human functions and dynamics) would gain coherence in a double contextualization in space and time, due to an error of quaternarists geologists, as we know. Prehistory would born with Boucher de Perthes, emerging from the studies on the terraces of the valley of the Somme, that would lead him to relate the climatic and environmental evolution with the human evolution. Not finding fossils that allowed to date the most recent terraces in France, and finding in them several artefacts, him and other quaternarists used these objects as chronological indicators, assuming an evolutionary logic from the simplest to the most complex. We now know that they were wrong in this understanding, but this closed the archeological, scientifically based matrix of knowledge: a field of study, focused on the material vestiges of the past (assumed as indicators of human dynamics) but fully geographically contextualized raw materials, biome, climate ... all this we find in nineteenth-century texts, for example when discussing the natural or anthropic origin of the concheiros/sambaquis) and historical (including the anthropological dimension).

This triple root has, therefore, a coherence that the different theoretical approaches (which are not true theoretical currents but are echoing within archeology the great currents of thought, from positivism to historicism) did not question. When we revisit Boucher de Perthes, Gabriel de Mortillet, Oscar Montelius or, in the twentieth century, Gordon Childe or G. Clark (see the works Dawn of European Civilization by Gordon Childe and Prehistoric Europe: the economic basis by Grahame Clark), it is this coherence that we find, certainly tempered by the advances of research and theoretical perspectives.

A coherence that has in the artifact its epicenter: archaeologists are specialists in objects (including in these so-called structures that, as we now know, tend to embrace more and more of the anthropized territories) and their material conditions of production (and in technological innovation). This work is pursued in a radically multidisciplinary framework, and indeed archeology cannot be considered as a discipline, but as a multidisciplinary field of knowledge (such as ecology, for example) ... born over a century and a half ago! That is why archeology had such difficulty in entering the university environment, that at the time still lived the effort of consolidation of disciplines, and had to wait for 1935 for the creation of the first specific course (wisely a Master's degree, oriented in the newly created Institute of Archeology in London, where, along with cultural studies on Egypt or Greece, he learned photography, drawing, conservation – see Drewett, 1987).

Archeology therefore has as its focus the study of human behavior, in the territory in which it is inserted, on material culture and on its production and use chains. This focus on material culture crosses the three main structuring notions of behavior: space (dimension perceived by the senses, though structured by the geometric mathematization of the context), time (not apprehensible by

the senses, but structured by comparison through movement and transformations of bodies in space) and causality (the establishment of a nexus of consequence between two or more observables – see Oosterbeek, 2013).

Archeology was finally born, as seen above, by a concern of geologists concerning time; but it is important to understand that this was a concern of geologists, and their mistake was to think that objects are rigorous indicators of time. In fact, the domain of Archaeology is the space, the positioning of the remains in their physiographic space (Oosterbeek, 2000): we can rigorously associate "this monument with that mountain", and describe the economic relations that relate "the granite blocks of this palace with the outcrops on that hill"; but we cannot be absolutely certain that "these two underground houses are absolutely contemporary." We have difficulties with the temporal thread beyond the long time, and so we often give up chasing it, and many of us even deny (we mistakenly believe) the unity of time in favour of the many stories in which it breaks down. In this sense, archeology does not segregate itself from other sciences as an autonomous science: it is something else, it is a field of study that has its own discipline of study, but it has no social interest when disconnected from the great questions of the humanities within an historical and anthropological scope). For this reason, the so-called public archeology, when reduced to the rescue of remains, is largely useless and to be sooner or later condemned to extinction. Definitely, archeology is always more than archeology, contrary to what Ian Hodder (2003) wrote, recalling David Clarke.

The greatest rigor in archeology is the description "of this stove", or "of this grave", events that are nevertheless articulated with increasing difficulty in the short time approach to global contexts. From these difficulties arises an obsession for the short time, for the event, which in our view denies the social interest of archeology (perceiving space as a series of snapshots of a long time) while ignoring its cognitive interest (as a specialty that studies the past technology, and allows us to value in contemporary society the relevance of technology in the unity and diversity of human behavior, and in particular in the genesis of the notion of immanent causality – Oosterbeek, 2012).

In the general framework of the sciences, archeology should be understood as a platform of multiple crossroads, anchored in a rigorous methodological body, and oriented to the understanding of the dynamics in the past from different disciplinary perspectives, which are being overcome. But this diversity of "disciplinary perspectives" should not be confused with relativism, with the mere point of view. Like ecology or nano-sciences, archeology incorporates legitimate epistemological debates that derive from this diverse disciplinary matrix, but this legitimacy stems from the reference to material vestiges (in the case of derived epistemology) and not just from positions emerging from philosophy or from other fields of study (such as anthropology or history), or ideological options beyond science (however legitimate).

In this sense, we believe that there is no imperialist archeology (although cultural imperialism is a reality), or feminist (although feminism has an important place in society) or indigenist

(although the rights of indigenous communities are fundamental), just as there is no imperialist, feminist, or indigenist mathematics. Another issue is the use that social and political groups make of archaeological knowledge at every moment and the pressures they exert to exclude from research certain themes that may be uncomfortable for them. Archeology almost always intersects conflicting interests. This is due to its fundamental territorial dimension, but not to a disciplinary characteristic. Issues such as the archeology of the disappeared during the dictatorships of the twentieth century, or the archeology of slavery, are clear examples of this. But the same applies, albeit with less socially diffuse emotion, to the archeology of religious sites in contexts of conflict, or even to the archeology of the first humans against creationism.

Not separating these two dimensions is nowadays a strong instrument for neocolonial interests, in order to devalue the importance of science, which was and is so decisive in securing a knowledge advantage that serves the domination of certain interest, precisely when this domain is put into question - an ideological battle that from UNESCO to several well-meaning (but retrograde and, at the most, ethnocentric, if not xenophobic) discourses, expropriate these peoples from the full right to scientific knowledge.

Not being a mere constructor of a-historical points of view, archeology can be affirmed today as a field of socially useful knowledge by valuing the relevance of the materialities and limits of human behavior (so forgotten in the last decades!), within a framework which underlines the radical unity of our species, whose resilience and adaptive capacity rests paradoxically on diversity. In this sense, archeology allows us to identify what Lévi-Strauss called "elementary structures", while emphasizing the infinite diversity of concrete solutions. At the same time, it allows approximations to the paleo-landscapes, that is, to the elements of the territory that, in each moment, were perceived and cognitively integrated by the human groups in their adaptive strategies; this approach to landscapes (which are intangible mental images and therefore lost to the archaeological record) through the (tangible) objects, is operated in close connection with anthropology, but also psychology or art history.

Of course, archeology also creates cultural heritage, and thus participates in the field of cultural heritage management, where knowledge interests intersect with ownership, identity and processes of inclusion and exclusion. Archaeologists should not shy away from participating in this field, but without dissolving in it. The field of cultural heritage belongs to the conjuncture and to the event, while archeology is situated in the structure and context (although it works with traces of events) and for that reason the management of the cultural heritage is more markedly political (based on tangible realities, of course, but fundamentally in the arts and performative activities, that is, in living culture). Archeology contributes, in the field of heritage, to the identification of past possibilities, that is, to the memorial dimension of culture. But in its specific field, that is, as a producer of knowledge about the past from the material remains, archeology directly interferes with the construction of the identity of the species and the structuring of the notions of space, time and cause:

this is why society is more interested in the origins of humanity, the rock art or the great works of architecture of the diverse cultures and civilizations rescued by the archeology, than by the management of these same realities.

Dilemmas

"Is it not true that there is a limit, a ceiling that confines the whole life of men, that surrounds it as if on a more or less vast frontier, always difficult to attain and even more difficult to transpose? It is the limit established in each epoch, even in ours, between the possible and the impossible, between what can be achieved, not without effort, and what remains forbidden to men, once because their supplies were insufficient, their number too small or too large (for their resources), their work insufficiently productive, the domestication of nature almost to start"

F. Braudel (1992)

We live and work, still, under the paradigm of Kantian rationalism. It is true that knowledge is producing new approaches, and these generate worries and demolitions of previous visions, which assume the appearance of true revolutions. But despite Einstein and Niels Bohr, we still move within the framework of rationalism: the world Kant spoke of (significantly in his "Geography" that included history, anthropology, and physics) was already a space-time world, which valued difference and relativized customs, while rejecting environmental determinism and the illusion of freedom without constraints. For this reason geography was structured as a "temporal arm" of rationalist philosophy and archeology emerged within it very early (in the production of maps, but above all in the logic of cost-benefit relations in time). This primacy of territory, as a historically generated scenario, is present in Henry Breuil's explanatory models for rock art or Lewis Binford's for hunting-gathering systems. And even the notion of what we now call landscape archeology (Oosterbeek, 2009), that is, an archeology that seeks not only to describe the territory but to understand what communities in the past actually valued in it, is a notion that finds roots in researchers like E. Cartaillac, whose focus on rigorous contextualization led him not to recognize the prehistoric antiquity of Altamira's paintings during the International Congress of Anthropology and Archeology in 1880 in Lisbon, later leading him to write the famous letter Mea culpa of a Skeptic.

It is this long tradition that allows us today to try to go further, understanding that the perceptions of the territory do not only derive from technical knowledge or from chance, but are determined by social and individual interests: ethnocentric landscapes in traditional societies; anthropocentric landscapes in modern societies; multipolar landscapes in societies undergoing restructuring / reorganization (as in our days - see Jorge, 2006).

Ethnocentrism is by no means a reality of the past: the overwhelming majority of communities act according to ethnocentric views, localism being in part a constant expression of this, and

xenophobia being its greatest expression. In the end, the recognition of humanity as "one," and of "the other" as "another of myself," is an objective made possible by rationalism and operationalized by generous political wills of which Unesco has become an instrument, but remains a marginal reality, with little resistance whenever conflicts are generated. When distinct group interests oppose within one territory, they are carriers of distinct landscapes, and tend to be centered on those interests. Modernity is, above all, the creation of a myth of unity of the species, illustrated by the beautiful image of Leonardo da Vinci, which places our species at the center of reality and its dynamics, occupying the place previously reserved for the transcendent. All great civilizations, more or less radical, have taken up this universalist option, which has always been tempered by its own territorial interests, carefully guarding and punishing dissent, as M. Foucault pointed out in Surveiller et Punir.

Can archeology contribute to this multipolar view, projected in the past? It is very doubtful that as archeology it can go further than anachronistically projecting contemporary models into fragmented pasts, running the risk of replacing tangible records with literary argumentation, sabotaging the methodology that confers coherence, autonomy, and specific social utility.

But on the other hand, in a society in turmoil, can archeology avoid research in this perspective? The humanistic roots of archeology, as we have seen, lay in agendas for the consolidation of elites (antiquarianism) and their power (ethnological comparability), but their autonomy was only achieved by incorporating the scientific dimension of the earth and life sciences; if archeology returns to the logic of contemporary power, it is possible that it loses its wider, structural social interest. The excessive corporatism that the communities of archeologists assume in some countries, trying to impose their professional exercise in rupture with other disciplines, is an expression of this danger.

Archeology, which has grown exponentially in terms of the market in several countries (although this phenomenon is already in decline - Oosterbeek 2003), has lost in an accelerated way its real influence in society, in a process that is accompanied by the generality of the human sciences, or the humanities. Part of this loss is attributable to UNESCO's own anti-rationalist and objectively neocolonial discourse, which, by affirming education and technology as absolute priorities for the so-called underdeveloped or developing countries, to the detriment of the fundamental sciences and the humanities, condemns them to be reduced to reproducers of knowledge generated in developed countries, expelling them from the circle of truly new knowledge production and epistemological renewal. But the other reason for the loss must be sought in the internal difficulties of archeology and other humanities to achieve a renewal of their research focus, able to intervene in everyday life without being overwhelmed by the short-term agendas of this.

We must recognize at this point that the research frameworks built over 70 years ago for anthropology (see Levi-Strauss, 1958) and for History (see Fernand Braudel, 2001) were able to update the rationalist paradigm, capitalizing on the scientific advances of the first

half of century (including, therefore, quantum mechanics), valuing cultural diversity as a historical matrix (in which their contact with Brazil would have been fundamental) and intervening in its time with an agenda that valued regularity in diversity (anthropology) and convergence with distinct rhythms (history). In this sense, they did not submit to the post-war neo-positivist optimism (thus fulfilling a fundamental role of the humanities, which is the relativization of short time absolutes, in favor of medium- and long-term reflection). How can the humanities and archeology today contribute autonomously to a society in which the words "relativism," "deconstruction," or "democracy," have become the new absolutes? What fashions do we have to resist today? Which brings us, necessarily, to the field of cultural heritage.

Human societies are a web of relationships, in the context of landscapes mediated by a game of appearances punctuated by patrimonial markers, with a trajectory that has always been based on group strategies. Social, economic, political, ethnic, ... among human beings and between these and the environment (economics), and that constitute the core of culture as a series of mechanisms of mediation of these same relations: mechanical (technology), communicational (language) and behavioral processes (rites). But relations marked by the noise that comes from speaking distinct languages (often with similar words, which creates even more noise), in which each group is reinforced by the identity affirmation based on a mythical foundational course (totem, gods, revolutions,...) that renews through rites spatially associated with patrimonial markers (what we call "cultural heritage").

It is not by chance that in a society that moves towards the end of its developmental cycle without knowing what will replace it, and in which the groups are actively mobilized (through the weakening of dominant groups), the concept of patrimony has broadened to the point of practically covering the whole planet (with a strong contribution of archeology). The 21st century is already witnessing major geostrategic changes, with the loss of US influence, the inability to integrate the European Union, bankruptcy of several states, the anachronistic return of nationalism, the return of maritime piracy ... but we are still far from a new framework, and the only certainty is that it will entail a reorganization of the territories.

Interest in heritage also lurks there, seeking reconstructions of the past more in line with the different interests involved, as they prepare for more direct confrontations. Just as the hippocampus stores classified impressions of past events, which are individual memories today, institutions (academies, museums, but also churches, police or political parties) store the impressions of past events that are relevant to social organization (pyramids, axes, performative spaces, manuscripts, etc.), as the Taliban well understood, when they destroyed the statues of the Bamyan Buddha, and how capitalist urban societies often forget , destroying their historical heritage and later regretting their social disintegration.

Archeology helps to build heritage, that is to say, the cultural fossils of memories, including human groups inherited from past non-generators of great monumental constructions, and this is a relevant

intervention in today's society, expressed for example in the commitment of UNESCO for the inclusion in the world heritage list of prehistoric sites and rock art. But archeology has an accessory place in this process. A place with lots of media exposure, lots of money, lots of energy, but not a lasting place, not a radical, fundamental place. And, after the convenience of the moment, or once changed the group interests, all patrimonial management and its definition of priorities tend to change, except the territorial base and the central nucleus of rational and rigorous knowledge (subject to criticism and incorporation into plans of knowing more detailed, but not of elimination without implying retreat of the own knowledge - Oosterbeek, 2007).

We thus return to the field of knowledge production and science. Although archeology should not be understood as a science, as we have seen, it is to the field of science that it belongs. This is a dimension nowadays very much questioned, sometimes to question the scientific status of archeology (which does not shock us), others to question the very value of science within the framework of multiplicity of opinions and knowledge. In this case, the arguments center on the condemnation of legitimacy by authority (admittedly, scientists begin by inheriting the status of alchemists, and before them metallurgists and elders - that is, an authority anchored in the usefulness of their respective knowledge), but above all in its non-objectivity (often misapplying the Eisenberg principle, which postulates that it is not possible to observe without interfering due to the limitations of the observation apparatus when it is exercised over the infinitely large or the infinitely small) .

Generally, these criticisms that would be reasonable in the face of positivism, stem from the ignorance of subsequent epistemological deepening, and in particular of the definition of the real (and the objective) as a synthesis of multiple determinations, that is, something that can only be known in a rational way) precisely because of the physical impossibility of observing all these determinations (Kosik, 1969). The naive idea of an object detached from the observer as observable has not dominated for more than a century, but this does not mean that science can be confused with common sense or other forms of knowledge: it maintains the characteristics of theoretical and methodological rigor, and formalization, which make it specific. It is in this sense that archeology is part of the "cluster" of science, and that is why there is no archeology without artifacts and artifacts (which are its object). This does not prevent much quality archeology from taking place according to the paradigm of social intervention, a reality that reduces the scientific dimension of this archeology without the understanding of the cognitive or social benefits derived from it.

Archeology in a time of change

There's a battle outside / And it is ragin' / It'll soon shake your windows / And rattle your walls / For the times they are a-changin'.

Bob Dylan

There is a general perception of global change, reinforced by the media that echo the notion of globalization. The twenty-first century began under the double sign of the geostrategic recomposition marked by the rise of Asia with consequent loss of influence of the United States of America, and the exhaustion of an expansionist economic model that has nowhere to expand, which is at the root of the current depressive cycle. A biologist and professor of economics, Rosa Luxemburg explained a century ago the contradictions between Marx's predictions of imminent collapse of more developed capitalism and the reality of its continuity, in view of the notion that the capitalist system grows whenever it encounters non-capitalist contexts for where to expand (colonies, etc.). It had in this sense a global vision of the economy and of society as a complex of systems, which was certainly due to its solid naturalistic formation. Will the next decades confirm Rosa Luxemburg's thesis?

The understanding of the process is very limited, hampering foresight exercises and, as a function of them, the efficiency of the short, medium and long term agendas. Contrary to the more widespread notion, globalization did not begin with the maritime expansion of the Iberian powers (and after Europe as a whole), even if, as Braudel pointed out, it is with them that the discovery of the great oceans takes place, which will allow to unify world trade. The planet is a global system, in which the elements of each species act identically, contributing to a dynamic balance of a network of ecosystems. Primates, including humans, have long followed this adaptive behavior. However, the growing use of instruments suited to different functions, true extensions of the body itself (André Leroï-Gourhan, 1984) and the colonization of others continents from Africa (since at least 1.8 million years ago), were a behavioral novelty, that would deepen in the diversity of economic strategies (different types of hunting and gathering first, strategies of production in the last millenia) and division (fostered by the economies of production).

In an environmentally global world (though with subsystems, of which cultures were the expression among humans), human societies have introduced economic and social fragmentation, generating increasing conflicts between human needs and natural resources. The great cultures of the late Pleistocene, and later the various civilizational processes, constituted other expressions of globalization, that is, of the uniformization of behavioral (economic-social) patterns for the respective "worlds". The current globalization, when building a common world economy, and pressing for the planetary social reorganization, consists in a realignment of the economy with the global environment, that is, it is an overcoming of the ruptures that the species previously introduced.

In a context of manifest integration of ecosystems and of integration of economic systems, the growing social divide acts against globalization, which creates tensions and conflicts (Oosterbeek, 2012). And today as in the past the dynamic balance of the relationship between societies and ecosystems is a relationship that essentially involves two pairs of correlated variables: environment and technology, on the one hand, and logistics and social organization, on the other. A break in any of these four variables leads to a global break. In this

context, crisis settlement models present extraordinary structural convergences, in addition to differences in socio-economic mode. For example, the use of large public works to revive the economy and enable social expansion is not an appanage of contemporary society or an absolute invention of Keynes (who certainly theorized and demonstrated it in the context of industrial-financial capitalism crisis). We find the same solution in the great processes of urban renewal with Emperor Nero in the Roman empire, or in the great constructions that consecrated the so-called Manueline style in seventeenth-century Portugal, to name just two examples.

Rigorous Western knowledge emerged from medieval scholasticism, associated with the creation of the first universities as spaces of totalizing knowledge, integrating the different traditions of knowledge that had broken up at the end of classical antiquity. Science has constituted itself in modernity as an analytical effort in an era of exploration of the ways of physiographic integration of the planet, and in this sense has surpassed scholastic knowledge and common sense. The new stage in the process of globalization, which we are experiencing, is marked by transversal processes of multidisciplinary integration, by the logic of networks. In this sense the transdisciplinary fields of knowledge are the new effort that the rigorous knowledge is summoned to operate, and Archaeology is precursor of this process. The development of the radiocarbon dating method, which would justify the award of the Nobel Prize for chemistry to W. Libby in 1960, is a clear example of how early archeology participated in this new scientific logic. Processualism in archeology has more vibrantly expressed the potentialities of transversality with the exact and natural sciences, but actually balanced an overvaluation of the human sciences that dominated the first half of the twentieth century.

It is not a question of overriding the disciplines (as in modernity classical references have not been deleted), but of deepening them in their transversal relations. Science is a rationalization effort that enables innovation and in which disciplines do not look at reality, break it down and domesticate it. But it is no use dissolving the analysis into a relativistic syncretism; the epistemological developments will be based on the achievements of modernity, not against it, just as the transdisciplinary advances will be made on the basis of analytical disciplinary deepening.

Archeology finds, in this context, a new social function, in addition to the reconstruction of the past from its material vestiges. To the extent that archeology operates on tangibilities, studying in particular the role of technology in the articulation between human dynamics and available resources, it stimulates reflection on the causal mechanisms in the interactions between human groups and their interactions with their contexts and can demonstrate that all societies of the past have found concrete, material points of rupture and fostering the critical, rational competence of citizens. This competence, which consists in the awareness of the dilemmas facing societies today and in the understanding that we are a moment of a trajectory (which we can influence to a limited extent) is especially reinforced by the socialization of archaeological knowledge through participation in the

processes of research (from participation in excavations to experiments in experimental archeology - see Oosterbeek, Cura & Bastos, 2011).

It is in this way that archeology will be able to play a useful role in current plans for the intervention of sciences in society, such as the Future Earth project or the International Year for Global Understanding (IYGU). Initiative of the International Geographical Union, supported by the International Councils of Science (ICSU), Social Sciences (ICSS) and Philosophy and Human Sciences (CIPSH), IYGU aimed at promoting understanding of the global implications of each of the choices that human societies make, as well as the impossibility of managing such societies in isolation from the globalized world. The contribution of archeology is essentially structured in two levels: the understanding of the relation of Humanity to the territory and the understanding of the role of technology in the construction of adaptive solutions. Archeology allows to substantiate the notion of long time, documenting the processes of formation and, more important, extinction of cultures and civilizations (Djindjian, 2010).

By documenting the relevance of materialities and territory, archeology forces a relationship with the past that is not reducible to episodes or to striking characters, but is structured around the fundamental needs of any society: food, habitat organization, economic relations, logistic networks, the corpus of technical knowledge, communication processes, art ...

This is a path that archeology can take only from the integration of its different disciplinary roots, and especially from its two great traditions: the historical and anthropological traditions.

Three: From Heritage into the Territory – agendas for an unforeseeable future

The nature of the global crisis and the place of Heritage

Between each of us and our context there is substantial continuity, actually a chaotic continuity, which imposes on us the task of sorting, ordering, this "everything else". Such classificatory approach defines cultures, from the setting of boundaries between "groups of things" (“the houses are different from the streets”, “the clothes are different from the car”, “my family is different from other families”, ...) until the definition of associations that go across these boundaries (the houses and the streets are urbanization, clothes and cars are comfort, mine and other families are human, ...).

Although these groups or these boundaries are not substantial, because they depend on our cultural sight, we cannot live without a certain degree of consistency between what we grouped together and what we excluded. Flees are not food, for many of us, but for others and perhaps for everyone within a few years, they will become such.

In fact, we live largely undefined and unforeseeable times. Assumptions that not long ago were taken for granted (the European unity, the North/South Mediterranean divide, the heterosexual nuclear family, the condemnation of the death penalty, the durability of peace, the danger of overpopulation, ...) gave place to a sea of uncertainty, which has not set up alternatives, but disrupted convictions.

What is the way forward? A mainly prudent approach focuses on keeping stability, based on a global awareness that changes often

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precipitate more anguish than progress, more suffering than benefits, in face of global indicators like ageing, poverty or increasing violence. A more reckless approach seeks to build new divisions and new classification groups, foster economic and political disruptions, understanding the weaknesses and, often, the injustice of past solutions. Yet, both fail to understand that the future, whichever it will become, will be about change, but not a change we can anticipate in terms of its final outcomes (even if current trends are perceived). Perhaps this is the time to understand not only that the change takes place, but also that we cannot anticipate the future direction of this change. Episodes of a moment (the fall of the Berlin Wall, the extension of human rights, de Arab Spring, etc.) may be just that, without following episodes (as the initial republicanism in France, or the utopian ideals of Communist mid-nineteenth century), or maybe not! To a large extent, we live in a time dominated by serendipity (Monod 1972) and it is on this basis that one should define strategies.

In a sense, we face the future as in other occasions in the past, preceding major shifts. As when St. Augustine marked the end of trouble for the defense and recover of the Roman Empire, to focus attention on the living people and not on past structures or future ideals. Or when Taoism evolved to non-action, within a context of consolidation of the Eastern Zhou Dynasty.

At the basis of structuring our different ways of thinking are our actions, but those actions are often thoughtless. The consistency of actions is often a result of a retrospective perception of the past, following previous inconsistency (Auster 2003). And acting imposes a balance between foresight without the anguish of the future and not scarifying the people of the present and their different understandings of their past, without which it a common future will not exist.

The crisis that is currently going in and out of the covers of newspapers since 2008 is not identical to the crisis that preceded it in the previous decades. It is not just a crisis of overproduction that requires "adjustments" in the factors of production cost and which can be overcome through economic growth generating employment (Oosterbeek 2006).

On the one hand the current crisis is marked by a violent increase in global unemployment, up from 15% to 20%, and on the other hand GDP growth, supported on technological innovation tends to further increase structural unemployment, at least for many years to come. This explosive combination, that from Morocco to Ankara, from Lisbon to São Paulo or from Luanda to Caracas, frustrates the expectations of youth, tends to impoverish the middle class (as it now becomes clear in the BRICS, with the relative exception of China) and generates increasing socio-cultural tensions that result from the current limits of expansion of markets (Luxembourg 1972). This type of crisis occurred twice in the last 150 years: between 1873 and 1896, and between 1929 and 1947. In both cases it led to wars, to the modification of frontiers, to the redefinition of the international market and, finally, to a reorganization of global geostrategic balances. In both cases the immediate generations referred to those episodes as being a "Great Depression", and that's the nature of what we are today living, still in its infancy.

Material cultural heritage becomes particularly relevant in prolonged crisis moments, not as much because it fosters identities differentiation but due to its ecumenical potential for a "new" stage. In fact, the modern heritage begins with the public access to the great palaces and collections of the aristocracy, following the French revolution, leading to Museums in continuity with the previous notion of broad cultural training of elites (e.g. the Hermitage or the Louvre), but also to affirm a symbolic legitimation of the new socio-political order no longer through the Church but embodied in public School and the civic Museum. And it was during the great depression that heritage gained greater expression, first through nationalism (that seats at the origins both of looting and of the "repatriation" claims) but at the end of the depressions (and wars) as a factor of intercultural encounter and peace (and that's how was born the notion of heritage of humankind, which was making its way after the last world War, and against which reacts, objectively, the current trend of re-nationalization).

The times we live in are the initial cycle of depression (Krugman 2013). The growing nationalism is very visible in Europe and America (North and South) political debates , but is also stressed by the collapses of states, from Iraq and Libya to Afghanistan or Somalia, as well as by the reorganization of the ancient empires of the eighteenth and nineteenth centuries, from Russia to Turkey. This trend is accompanied by increasing conflicts with no foreseeable end, a scenario in which the most enlightened leaders are forced to quickly change their alliances (not by chance the United States and Iran are now on the same side regarding the emergence of radicalism), while people, and primarily impoverished middle class, opt for segregation episodes.

Which cultural heritage will emerge from this cycle of depression? It seems clear that we still live the initial destructive cycle, where protectionist laws stand in an attempt to counter with papers the cycle of history. But the truth is that at the dawn of the twenty-first century there are only two certainties: there will be increased participation of citizens, exposing conflicting interests that often are incompatible within the present framework (many of which consider that much of our contemporary cultural heritage must be destroyed, as a manifestation of idolatry or a symbol of a society they wish to destroy as well) and geopolitical boundaries will change in a context where, in environmental terms (Santos 2007), also some territories will change (disappearing or emerging).

In this context, it seems important to foster a notion of universal heritage, not nationalist and capable of movement (in the museum networks but also in the market which is the largest generator of dynamic and progressive cultural identities), although at this stage this is against the trend in most countries.

A new past heritage is required if a new future is to be built.

The expansion of the concept of heritage and its implications for management models

The concept of heritage experienced a geometric expansion from the 1980s, following the progressive decomposition of the global economic and political system, the weakening of empires, the centripetal tendencies that were reinforcing the logic of regionalism and localism and, finally, the ideology that accompanied this process: postmodernism. Archaeology, and in particular prehistoric and modern archeology, were and are fundamental pillars of this expansion, which conceptually leaned against the landscape of anthropology, that is, the theoretical recognition of cognitive prevalence of space on cultural diversity.

The quantitative expansion of an heritage that was now potentially includes anything that has been or is touched by human sight or anthropic interest, generates new challenges to its management. Whereas monumental heritage, which dominated earlier, found a socioeconomic justification in tourism development and national identities referencing, this new diffuse and ever growing heritage requires the same kind of technical intervention, and its costs, but often does not have tourism potential nor a strong value to strengthen local identities.

The inability and financial constraints of national public bodies of the various countries to preserve and study in and adequate way this vast archaeological heritage, paved the way, from the 1990s, for an archaeology business sector, often of great quality (Robhran -González & Zanettini 2003), acting under consent of the government but breaking, in fact, with the State logic that dominated archaeological heritage management after the 2nd World War.

This change, creating a free market business sector (not considered by international conventions) generated tensions that resulted from a contradiction: the budgetary dimension of the study and conservation of this new heritage in permanent expansion, although it led to major advances in knowledge in some cases, often produced results that are not visible either for research or for society.

This expansion of the archaeological business was accompanied by a decrease in public budgets allocated to archaeological heritage, compensated by a growing investment in intangible heritage, a living heritage with a stronger impact both in communities' identities and self-esteem and in economy, through tourism and other services. Although the global budget for tangible heritage kept on growing, its structural basis changed and became more and more dependent on private funding related to the application of environmental legislation to the heritage sector.

Three difficulties arose from this model:

The first is now more obvious: the reduction of public works in the context of the current depression had a very severe impact on tangible heritage investments, with negative impacts in terms of preservation and study, but also in the employment of younger technicians that, from the 1990's, started to be trained for this unstable market. Anxiety, loss of heritage and deception of expectations are the main consequences of this difficulty.

The second is more complex, and relates to a conceptual mistake: in the market economy, it is not possible to establish "half-

business": whereas in the sectors of art or architectonical heritage there is a market of exchangeable items (an heritage that is bought or sold, in a market that requires a large number of experts for that reason), the same does not occur with archaeology, which represents almost 100% of the whole of heritage, requires very significant financial resources, but does not admit trade. The decreasing interest of the private sector to legally invest in tangible archaeological heritage, particularly in the context of economic depression, is the major consequence.

The third, yet, is the more severe consequence: the decrease of social interest in tangible heritage, to the benefit of living heritage, represents also a shift from the heritage that allows for multiple intercultural appropriation, to the heritage that stresses cultural uniqueness and divides among the living. This is, today, a major threat for intercultural relations.

We need, in this context, a new management model, adapted to the current globalization context, understanding that tangible heritage is a core component of any integrated management of the territories, precisely to the extent that cultural issues are clearly territorial (Kant 1999; Oosterbeek 2007; Samassekou 2012) .

An integrated land management for sustainable development and peace

There is a mismatch between the classical dominant economic theory and the current reality. The theory states that the system tends to a balance between supply and demand, (the "invisible hand" of Adam Smith, 1989), with regulated prices based on cost factors (raw materials, soil and earnings at Jean -Baptiste Say, 1983). The reason for this inadequacy is that the classical theory corresponds to the emerging time of an economic system (capitalism) erected in dominant cultural complex against previous models (in particular feudalism). As with all cultural processes, the dynamics of combat united diverse interests, forging for some time a common identity. But this is no longer such time (Jones, Ocampo & Stiglitz, 2010).

Indeed, further development scattered this initial syncretic unity through the proliferation of different cultures, while the increasing the financialization of the economy cancelled a basic assumption of classical theory: that the coin is "neutral" in the process. It is not the first time this has happened, because it happened in the second and third decades of the last century, when a very high inflation context generated a later recessive trend, leading to jobs consumption (Keynes 1992).

Therefore, entrepreneurship, at present, more than to forecast or induce global market needs (which are driven by speculative supply), must focus on the diversity of culturally different needs (which in sometimes referred to as "niche markets"), a process that is not univocal but plural and volatile.

In such a process, whose relevance has not stopped growing after the 2nd world war, cultural heritage serves as a potential economic stabilizer of market volatility, in that it embodies a large number of different cultural processes, which intersect in the same

"fossil memorial", subject to multiple appropriations. This is the main reason for the growing importance of laicized cultural heritage, considered to be of universal value in modern societies, and this is also the reason why it is rejected as such by all nationalisms (those more violent, as in the case of the Taliban, but also those more subtle yet no less ethocentric, as when focusing primarily on intangible heritage, or when favoring the complete repatriation of objects to originally non-existing nations).

In classical economics, mostly dominated by the liberal faith in a self-regulated market and in boosting the offer, only Thomas Malthus (1999) envisioned determining the weight of demand, particularly as an inducer of innovation (concept which would be later developed by Boserup). In any case, throughout the classical economics, as in contemporary neoliberalism, the state was to be supplementary, protecting property and facilitating the flow of the economy by deregulation and the encouragement of education and training.

Under this classic and liberal view, cultural heritage was largely conceived as part of the private property of families, to be transmitted by inheritance to descendants. But this view is no longer suited to a society where individualism became mainstream, where family clusters fall apart and the proliferation of communities' identities required an expansion of their fossil foundations: ethnic heritages.

Paradoxically, the numeric expansion of heritage items and of their plural dimensions, reduced the political and financial value of the individual assets, still protected by laws designed for a more restricted set of unambiguous "objects", and not for "clusters" or "landscapes". This decrease in absolute value is especially noticeable when compared to the valuation of the arts. Theoretically, the heritage objects should have a marginal utility (the concept of Marie-Esprit Walras, 1983) greater than the works of art (since their producers died, rendering impossible to produce more identical goods), but in reality the artistic contemporary objects that have a higher marginal utility (even if "original duplicates" are possible, when the artiss are alive).

The reason for this contradiction is the exclusion of mobile heritage (archaeological) items from market processes, which is a measure to protect them from looting but that ends up by reducing its social relevance and, therefore, its cultural and economic individual value. In this regard, it is of great importance the ongoing research of Henrique Mourão (2009) on the relationship between market and archaeological assets, considering them diffuse goods (neither private nor public) and considering heritage preservation in the context of current territorial dynamics.

Michael Porter and Mark Kramer (2011) have argued that the business system is seen, increasingly, as a perpetrator of sustainability, which thrives at the expense of society. In this context, the authors attribute responsibility to the larger companies, for not taking a stance on the customer needs and interests and for focusing on short-term financial performance. "How else could companies think that simply shifting activities to locations with ever lower wages was a "sustainable"

solution to competitive challenges?" (p.4). They propose as an alternative to the current model of "social responsibility "(endorsed by the big world companies, mainly focused on creating a good image, while the bulk of social care is the responsibility of the state and NGOs) a logic of "shared value" to assume social development as a fundamental economic asset.

Porter and Kramer argue in the same paper that companies can follow three ways to create shared value from social progress: "By reconceiving products and markets; By redefining productivity in the value chain; By enabling local cluster development" (p.5). This contribution is particularly interesting for two reasons. Partly because it refutes strategies based on "under competitiveness" (low wages, low raw materials cost, low technological complexity, constant relocation, divorce between the company and its social environment) and stresses that the current capitalist model is doomed to lead to disruptions (growth of extremist and populist movements around the world being a clear sign to that effect). But mainly because it underlines the importance of logistics and multi-sectoral integration, where companies, social groups, higher education and other resources can be linked in a logic of growth and not just redistribution. An integration that places again the humanities at the epicenter of the challenges of the XXI century, since it requires shared foresight and vision, themselves to be anchored in the extension of a common past heritage (Oosterbeek 2011).

Porter and Kramer are close to a logic of cultural integrated landscape management, understanding that it is the social community and not the shareholder profit that is the base of economy resilience, even if they ignore a fundamental aspect: there isn't just a social matrix, since similar social networks encompass different cultural views trends that render inefficient universal models. In this context, the value of assets is only consolidated if shared and preserved in the medium and long term; otherwise it becomes quickly exhausted because its temporary use value is very low (except in the context of major conflicts and scarcity). This is why cultural heritage, provided it is shared and made accessible, become so important in contemporary culture and economics: it is a key to resilience in times of acceleration and change. And, for this reason, the destruction of Palmyra or Nimrud by Daesh was an efficient means to disrupt economics and territory based cultural identities.

We believe that the future will bring us solutions that we cannot foresee, precisely because we live in times of transition towards uncertainty. But it is very likely that the generation and socialization of knowledge will be at the core of those solutions, for knowledge is in fact the only value that is not exhausted by its use. Thus the need for strategy focused on creating knowledge (Djindjian 2010), which implies bringing together economy and culture through heritage, the involvement of higher education and research centers in all stages of the process, and their socialization (Bahia & Oosterbeek 2014; Oosterbeek 2013).

This is, possibly, the only remaining road for peace.

Four: Endogenous and contextual constraints of cultural integrative mechanisms: two examples of a similar process

Cultural interaction

We advocate that main drivers of human behaviour and transformative capacity, such as identity and economics, are the product of academic specialization, and that human behaviour as such, as life in general, is a systemic integrated reality. In this sense, the advantage of analytical studies on human behaviour become a problem once they are taken for what they are not, as entities that exist separately. We advocate, though, that there is an outer non-anthropic reality, and that humans need to understand their very limited capacity to change it, even in the current so-called Anthropocene (Lewis/ Maslin, 2015), a generous but actually very anthropocentric reading of the planet, in the age of the insects! Humans are constrained by both external realities, that they can hardly modify, and internal divides, that they may overcome through cultural interaction. Cultures and Civilizations are the behavioural players of this game.

Also, cultures and civilizations are not closed entities, but open and dynamic ones. They emerge as regulator processes in the course of cooperation of humans in the attempt to bridge the gaps between their needs and expectations, on one hand, and their potential resources (including other humans). Processes of integration are, therefore, not an exception but the rule of cultures and civilizations, and possibly the most important mechanism of cultural transformation. This mechanism acts, most of the time, through peaceful transformative gradual processes, although on occasions it may also be violent (namely in contexts of extreme scarcity of resources, of restriction of available space or of cultural representations of identities perceived as frozen and mutually exclusive entities – the latter being more characteristic of decaying cultures and civilizations).

Human groups tend to avoid major changes and moving into unknown territories, leaving this approach to minorities of explorers. There is a good reason for this conservatism: the increased risks once moving away from established patterns. Yet, contextual changes may trigger adaptation needs, following other primates' behaviour patterns (Strier/Lee/ Ives, 2014).

This was the case at the dawn of food production and, again, of the global market economy. Both processes are global, implying geographic and knowledge expansion, and share some traits.

[4] *Presented at The Fourth Annual Conference of World Cultural Forum (Taihu, China). Join Hands for a Human Destiny Community. Macau, China, June 2016.*

First, they are preceded by a sequence of global climate warming first (allowing for population growth in the early Holocene and following the middle ages in Europe), then cold dry oscillations (inducing a shortage of food, famine and social stress, requiring economic diversification) and, soon after, a new increase in temperature (allowing for agricultural expansion and greater interaction and trade, i.e., the consolidation of the new economic models). In this sense, both are to be understood as successful adaptation processes.

Secondly, they both consisted of profound globalizing integrative processes, destroying alternative models of economic autarchy (hunter-gatherer networks in the first case and non-global market oriented economies in the second). In this sense, they suggest that once globalizing processes are launched, it becomes impossible to prevent change, either through cultural interaction and economic growth or through cultural isolation and economic decay.

Thirdly, the transition was made bridging different cultures or civilizations, evolving from contact into exchange, and from the later into replacement of old models by new models. This suggests that major changes in the past occurred in as part of relatively more peaceful processes that rapid expansions.

Bridging two worlds: technology at the dawn of agriculture globalization

A rapid increase in temperature and humidity after 11.700 years ago, at the end of the post-glacial period (Younger Dryas), generated dramatic changes in environmental conditions for human groups across the planet. The development of coastal and riverine resources, combined with the development of forests and associated fauna, offered excellent conditions for population growth all over the planet and, moreover, for them to resume past sedentary trials. By 9.000 b.P., several human sedentary villages existed, some having engaged in pottery production, or on sculpting, but none yet in food production.

A relatively short dry oscillation, circa 8.200 b.P., would become the first of a series of dry episodes (6.600, 5.600, etc.) that may now be perceived as having triggered major adaptive approaches from different groups. Those approaches, despite distances in time and space (Mediterranean, Southeast Asia, West Coast of Northern America, Mesoamerica, etc.) that stress the inexistence of any contacts among them, shared several common traits: intensification of the exploitation of available resources (namely through animal husbandry and later domestication of animals and grains), greater interaction exchanging resources among communities (trade, probably compensating a diminished mobility of the groups), development of group specific symbolic items (portable art, rock art, ritual performances), growingly different treatment of certain individuals (social ranking). This was a radical and global transition into a new era of humankind, economy of production, and occurred on occasions very fast (East Mediterranean) or in a gradual and slow pace lasting up to three or four millennia, during which farmers and hunters coexisted.

In all the processes, though, there are no significant signs of violence, evidence suggesting that the adoption of the new life styles was imposed by contextual constraints rather than by human conquest. Things would only change, in all cases, once civilization emerges, the earliest about four millennia ago: kingdoms and, later, empires, would then start and periods of rapid growth with strong violence, followed by rapid decay.

This early process of globalization seems, then, to be primarily connected with climate change and the need to adapt to the related environmental modifications, and not much to human pressure for expansion, in contexts when, beyond the recognition of cultural symbolic differences, living people would not necessarily value too much their economic differences.

Bridging two worlds: science at the dawn of modern trade globalization

The context of East/West interaction, accelerated by the Portuguese navigations, is another example of this chain of events that relates humans with wider outer phenomena. This interaction is often perceived as a successful economic and cultural bridging but without the relevance of other interactions established in Asia.

Yet, one can argue otherwise, considering the lasting impacts of this contact for the cultural structuring, e.g., of Portuguese and European understanding of culture and science.

Indeed, the core component of the maritime expansions and later interactions is not trade, even if this will become the most relevant economic dimension of the process. The core is a new understanding of the reality, breaking closed worlds and leading them into infinite universes, to use the expression of A. Koyré (1966). And, at the core of such understanding seats a new approach to knowledge: science!

Since the middle Ages, the growing contacts with the East revealed the possibility of alternative civilization processes. The capacity of observation by then was restricted to the recognition of characteristics that were valued in the European society as well, such as wealth, strength or gentleness, but nevertheless they introduce a dimension of scale, in size and distance, that will have a growing impact.

Yet, it will be the navigation expansion of the 15th and 16th centuries that will combine the curiosity with the technical needs associated to the complex logistics of the process, generating a specific new epistemological positioning, known as experimentalism. Rooted in the consideration of the prevalence of reason in the theology of St. Thomas Aquinas, cartographic accuracy will become the key driver of such new trend, later expressed in the collection of evidences from different species, patterns of behaviour or local knowledge.

The Portuguese literature of this time includes important texts that would have a later impact in shaping the posture of the Portuguese cultural and academic world. These are the cases of the letter of Pero Vaz de Caminha in 1500, describing the first contact with Brazil (with abundant description of the natural features but, also,

a quite remarkable observation of the indigenous populations characteristics, with a clear attempt to recognise positive relevant values in their different cultures), the treaty of Duarte Pacheco Pereira on geography in 1508 (*Esmeraldo de Situ Orbis*), the treaty of pharmacology of Garcia da Orta from 1563 (*Colóquio dos Simples e das Drogas*), the extensive and detailed book of Frei Gaspar da Cruz on China from 1570 (*Tratado das Cousas da China e de Ormuz*) or the *Summa Oriental* of Tomé Pires. The impact of these texts would shape the understanding of the Portuguese academia of its alleged specificity in the context of the wider renaissance period: a closer relation to experiment (cheered by the epic poet Camões, in his *Lusíadas*, published in 1572), combined with a solid cartographic knowledge and humanistic values. Later episodes, such as the burning of the bones of Garcia da Orta by the Inquisition, would not diminish the influence of this generation of the 16th century, as the republication of the *Colóquio…* in 1891 and 1892, or the first publication of the *Esmeraldo…* in 1892 exemplify.

The context of the Portuguese and Spanish navigations introduced a new scale that could be observed, not only inferred. While the understanding of the features such as the spherical dimension of the Earth were accepted from Aristotle (*Sobre os céus – "On the heavens"*), the navigations rendered it observable. At the same time, the scale of the Oceans required new techniques for asserting the position and the itinerary of the travels, namely correcting the magnetic declination of compass readings using new tools and mathematic calculations, but also new teaching methods (not only learning by doing, as was used for traditional crafts, but also academic training) and new professions. Part of this process involved also what we name today as dissemination, namely through the use of Portuguese and not only the Latin.

It was in such a context that a new natural world came to consideration. The economic interest, but also the intellectual appeal to the different, explain this new understanding of the diversity of species. The implications were crucial: from an authoritative knowledge, studies evolved to oppose observed facts to classical assumptions; from single individual reflective thinking, scholars evolved to the incorporation of teams, including assigning credibility to non-specialists as sources of information.

While in the religious sphere the Jesuits developed an adaptive strategy (*accommodatio*), the naturalists improved mainly in the observation and description. This lead to a systematic, but on occasions acritical, attitude. The most lasting advance was a specific methodological approach, based on experiment and observation. While being a major innovation, this epistemological approach elected authority, but also abstract non-mathematical reasoning, as the obstacle for knowledge improvement. This would explain, in later periods, a lesser importance of the humanities in the Portuguese tradition that evolved clearly to a divergence between two parallel routes: scientific positivism and literary humanism.

In a sense, once we read the book of Tomé Pires on China, we may perceive two parallel running approaches: a strong interest and admiration for the behaviour, the knowledges and the technology, on

one hand; and a deception in face of the system of beliefs, which is thought to be incompatible and non-convertible to the Christian one. Asia in general, for the complexity of the encountered civilizations, but China in particular, for this divergent system of beliefs, helped operating a secondary dualism: while St. Thomas had helped emancipating knowledge from religion, the contacts with China would strengthen a logic of emancipating trade from beliefs, a mixture that, to a large extent, was present in the Atlantic trade until quite late. Such secondary dualism, that we know became a characteristic of capitalism, would later pervade also Euro-American relations and, moreover, the early American understanding of its relations with Europe (as Thomas Jefferson would put it, in his nomination speech as President).

Knowledge and integration of processes

What we think is most interesting in this process is that, despite disparate later evolution of early contacts between different cultures, civilizations or socioeconomic systems, the two cases briefly presented, at the dawn of food production and at the dawn of global market economy, demonstrate that predominantly smooth interaction is possible once knowledge, including intercultural and technological knowledge, seats at the heart of the process.

This is also the sense of the International Year of Global Understanding (www.global-understanding.info): to foster a widespread understanding on how all aspects of human lives are interlinked and how and why human, social and natural sciences are fundamental to face current challenges. It is also the scope of the World Humanities Conference (www.cipsh.net), in 2017, and of the Apheleia network (www.apheleiaproject.org).

It is interesting to notice that, in face of very severe dry oscillations, both in the early Holocene and in the 16th century humans were capable of overcoming scarcity of food and other resources through engaging in wider and more complex networking, rooted in such knowledge development. Counter examples could be given, on culture clash, rivalry and war, from the collapse of Mesoamerican pre-Colombian civilizations decay to the world wars of the past century. The outcome of these, often also associated to dry episodes but under particularly cold conditions, is well known. It is, perhaps, reason for a prudent optimism in face of contemporary constraints, and, possibly, a deeper multidisciplinary and international research in Macau, involving historians but also archaeologists, anthropologists, philosophers and experts on science and technology, religions or languages and literature, would be able to shed some more light in this very unique hotspot of civilizations interaction and, also, foster debate on the bridging of different understandings of the past and of the present, generated by different disciplinary, technical or more widely cultural traditions.

Five: Anti-science in sustainability and resilience: absolute relativism in the aftermath of nihilism[5]

Rarely affirm, seldom deny, always distinguish.
St. Thomas Aquinas

A threefold trend

Three major dimensions characterise the current relation between science and society.

The first dimension is that the growing specialization of science and technology provided ever stronger solutions for human needs, which account for the extension of life expectancy, for demographic growth or for increased energy production, despite the spread feeling of failure in face of global challenges, which may be rooted in social inequality, economic uncertainty or cultural nihilism (Tartaglia, 2016).

The second dimension relates to a growing gap between adaptation processes and a restrictive understanding of science (limited to natural and hard sciences and, moreover, to technology), partially because science is about making small steps in face of specific problems, but adaptation is about making choices in face of dilemmas, based on values. The Humanities are the interface between these two processes, since they extend the space and time scale of problems, offering the occasion to make sense in such scale.

The third dimension is the decrease of participation of people in the production of science and technology, a result of specialisation but also of corporatism, that paved the room for a renewed magical understanding of S&T results, diminishing resilience of societies. The alienation of people's engagement in the scientific production processes allowed for an "Anti-science" discourse (Holton 1993).

The context of this threefold trend is the progressive integration of socioeconomic and environmental processes that for the first time in History confront ethnocentric cultures with the tangibility of a unique humankind challenged by common dilemmas. The cultural nature of such context generates a scepticism in whichever mechanisms that may have rooted their prior acceptance on, primarily, authority criteria (from family structure and churches to schools and science). There is an awareness of a long cycle of change, topped by the 21st century depression that does not find "answer" in short term explanatory models (namely those of natural and part of social sciences,

[5] *Presented at the Inception Symposium on Broadening the Application of the Sustaibability Science Approach in support of the 2030 Agenda for Sustainable Development. Paris, UNESCO, April 2016.*

despite their tremendous contributions for daily life). For instance, perceived global changes (environment, knowledge, geostrategic re-alignments) include contextual contradictions (e.g. between employment offer and technology innovation, the later promoting economic growth through the destruction of jobs, or a restriction of financial resources due to the exhaustion of the inflation cycle, generating growing pressure of short term demands). This context led to the failure of optimist short term narratives, which then combined with an over 200 years of growing clash of values, hesitating between individual and collective rights and duties, that find nihilism at its origin and cultural relativism as its climax.

Building from this understanding, one must consider four main issues: theoretical context (the epistemological implications of positivism and post-modernism mistakes); the need to make sense (understanding the difference between facts and perceptions and the resulting growth of anxiety among people); the praxis of knowledge (the role of tangibility in the learning process); and the methods that should be considered for sustainability science (clues for a programme of transition).

There is a first difficulty to overcome: the epistemological mistakes of positivism and post-modernism. In fact, after an initial sequence of integrated scientific reasoning, positivism became fundamental to consolidate disciplinary analytical advances, although paying the price of the loss of sense that lies in the global relation of science with life, and not on specific technical knowledge. This wasn't so evident when major science-philosophical systems were being established, until the dawn of the 20th century, but later stressed growing alienation. While post-modern criticism often attempted to resume a relevance of the humanities and of sense and context, it failed to understand that these lie not in different scales of space and time, and not on each specific field of studies. Part of this mistake resided in a weak understanding of science, often expressed through light consideration of complex theories such as quantum mechanics. Overall, post-modern relativism contributed in a significant way to undermine the relevance of natural and hard sciences (Baghramian 2007), while failing to promote strong humanities (precisely because it refused to understand the different scale of operation of the different types of science).

From this derives a first question: if science was born from the belief in immanent logical causality, through the valorisation of reason, observation and experiment, to what extent is it compatible with nihilism and post-modern relativism?

The decay epistemologies, despite their often elegant elaboration (e.g. weak thinking, de-growth, etc.) combined with the scepticism resulting from the failure of the post-war optimism and faith in a science capable of solving all problems and of setting a continuous improvement of life quality. But the critique of positivism, instead of building into a comprehensive integrated dialectic dimension, moved towards relativism, thus reinforcing anti-science.

A crucial consideration when discussing sustainability science is to understand the relation between knowledge and governance. In

fact, the key component of governance is knowledge, namely through two complementary poles: abstract knowledge reasoning on causality (awareness and science) and applied knowledge connecting needs and resources (logistics and technology). This means that governance is only feasible when its actors share a common (cultural) knowledge, i.e., an informed knowledge fed by tradition, new experience and mnemonics.

(Cultural) knowledge (k) being a time (t) product between gesture (m) and technology (y) [K=t(my)], the challenge for sustainability science is to be ready to be put into question, i.e., to allow for people to engage in practicing such science, including the questioning of the concept of sustainability itself, so that it might be generated through debate and not mere faith.

Making sense through praxis

There is a difference between processes that may be analysed through hard and natural sciences standardized methodologies and perceptions of those processes that are culturally driven. It is the gap between the two that causes anxiety. This leads us to a second question: How do human rights and ethical considerations on the access to territories and heritage impact on the retreat of science?

The difficulties of sustainability science also derive from the crisis of science Fordism (Gieryn 2008), the current way of managing science: valuing primarily quantity, short term deliveries and knowledge fragmentation; producing skilled workers with limited integrative knowledge, unable to make sense of their work; allowing people to perceive this loss of sense and to look for alternative narratives that might make sense.

Indeed, how does anti-science reveal itself? Anti-science is not merely, or even mainly, a discourse of negation (creationist or other). Its root is not the belief in non-scientific explanatory modes, but the decay of beliefs and the absolute relativism. Society is unable to understand the complexity of the debates on global changes. For this reason, it oscillates between negationism and catastrophism.

There will be no resilient sustainability science if a mid to long term reasoning, rooted in uncertainty, is not fostered through the Humanities. Changing the time scale into the scale of decades, centuries and millennia, allows to understand trends beyond the short-term appearances.

In this sense, one must stress the role of tangibility in the learning process, and the relevance of a praxis of participation in science building from non-scientists. It is by no accident that fields of knowledge in which people do participate in building knowledge (such as archaeology in which volunteers participate, astronomy in which amateurs may share observations, or computer science in which non-professionals may intervene) do attract the interest and respect of people. Which leads us to a third question: *is useful technical knowledge a process restricted to science researchers? What may be the role of traditional knowledge in a sustainable science programme?*

Probably, a sustainability science strategy needs to build from

the traditional knowledge experiments, framing their efficiency into a foresight process that only abstraction and formalization, i.e. science, are capable of delivering. Understanding that science builds from such traditional knowledge, while overcoming it through mathematics, allows us to move in the direction of a transition program that may foster the society resilience.

This implies to recognise the need to overcome some major examples of anti-science progress, not always recognised: the segregation of the Humanities (weakening the dimension of making sense of knowledge building), the divide between fundamental and applied sciences (weakening understanding of the radical major relevance of fundamental knowledge, despite its non-immediate applicability), the focus of funding on short term deliveries (technologies for problems and training for competences, weakening the flexibility for adaptation that only education for), the strict alienation and its cognitive implications (weakening critical capacities), or the xenophobic and ethnocentric questioning of the existence of Human epistemologies (instead of regional, racial, gender divides).

It is due to such a compound of anti-rational trends that anti-science often blocks the possibility of knowledge advances, for instance when the search for Human origins is put into question (through the racist appropriation of the past, occasionally framed as cultural rights not to disturb past remains that are racially assigned just to some human groups, without any scientific basis and opening a Pandora box that counters the notion of Humankind heritage), or when misunderstandings about climate change implications block behaviour adaptations (a result of the weakness of the positivist narrative of global warming). Opposite to this, one should notice the public interest in archaeology or astronomy, undoubtly associated to the praxis dimension in those domains and its consequences: cognitive elaboration (learning through doing), tangible or economic impact (understanding social use of knowledge) and making sense of the retrieved information (powerful narratives related to identity).

This is also the scope of the Apheleia strategic partnership for integrated cultural landscape management for global and local sustainability (www.apheleiaproject.org), which attempts to foster a combination of participative projects and abstract reasoning, anchored in specific territorial transformative projects.

A methodological challenge: to build a transition programme

The major challenge for the future of sustainability science (Kates 2011) is to bridge the gap with society, which leads us to a fourth question: *Can the interlinkages between adaptability, vulnerability and resilience be understood by society based on programmatic disputed goals (e.g. sustainability), or do we need alternative methods of engagement?*

It will not be through publicity that perceptions will change, since sustainability science requires understanding, and this may only be attained through participative processes. Indeed, science is about reason, awareness and critical reasoning, but despite its mainly abstract nature it may only be understood through concrete operative

procedures. Alienation is the key problem in this context, seating in the root of anti-science but also of other disruptive behaviour, such as culturalism radicalism. To understand this link is crucial for sustainable science.

The explanation of science relevance requires a strategy of participation, and in this process knowledge and governance are interlinked. In this context, traditional knowledge is a mix of contextual sense and tested efficiency, so studying and valuing such knowledge, explaining such process, bridges the gap between science and people, and diminishes the room for anti-science.

Three strategic recommendation derive from these considerations: sustainable science strategies should be built as part of governance strategies, understanding the complementary and different contributions of the Humanities and of natural, social and hard sciences; education, participative experiments, science based narratives and dilemmas debates should be promoted as comprehensive "packages", preventing their segregation as false entities; and sustainable science should be based on an integrated framework involving mid-long term humanities dilemmas and short term natural and social problems.

Finally, this leads us to three proposals: on resources (establishing a list of examples of transferable projects should be made available, that may find in the World Humanities Conference of 2017 a privileged forum), on education (at school level, at least one discipline or area of studies in all pre-University education should bring together human, social, natural and hard sciences, discussing dilemmas) and on research (funding of science and society projects should consider projects focused in involving people in the making of science – participative science).

Six: Management as a Liberal Art – Classical roots and contemporary practices, between *Eudaimonia* and *Oikonomia*

In the *Oekonomicus* of Xenofon, Socrates argues that the goal of household management cannot be restricted to material wealth, and should rather be concentrated in well-being (Alvey, 2011). While this text is often considered to be a first treaty on economy, it also encapsulates several of the main drivers of western thought about management: the relation between production (agriculture, husbandry) and control (war); the systemic nature of human actions (land exploitation and control, family structure, etc.); the relevance of psychology and rhetoric (leadership); the distinction between process (doing) and purpose (meaning); the limits imposed over human action (ethics) and the need to foster convergence of human efforts.

Closely related to the notion of management are the concepts of calculation in space (*logisticus*) and of military leadership (*strategos*), but also of four of the classic liberal arts: dialectics (to reason), rhetoric (to convince), arithmetic and geometry (to calculate in space).

The first relevant texts for management theory concern the management of things (focusing on how to combine relevant material resources to produce objects through known skills, and on how they may circulate – logistics) and of people (discussing who has access to objects and logistics, but also the cultural diversity of people and its relation to specific spaces, like in Strabo's Geography (Jones, 1917). But it is the divide between the dimensions of skills/fabrics and ethics/values, to be retrieved in words like τέχνη (Téchne) or ποίησις (Poiesis), that structures to a large extent the debates on management in the European, or Euro-Mediterranean, region. Hence the close relation between the reflections on management and those on law. As the Code of Hammurabi states in its preamble, *"When Marduk sent me to rule over men, to give the protection of right to the land, I did right and righteousness in..., and brought about the well-being of the oppressed"* (Harper, 1904), the core foundations of the concern on management are the control of men and of the land, exactly as we will find later, in Socrates and Xenofon: (Xenophon1994 ed.).

The reason for this approach derives from the emergence of the village, and later the city, as a central organiser of a food production economy: the need to cope with uncertainty of crops, due to meteorological and other factors, let first farming societies to expand domesticated areas, to intensify production techniques (from seeds selection to ploughing with animal traction) and to increase exchange with other human groups, thus accelerating globalization processes (Moore & Lewis 2009). Tensions between farming communities disputing land and tensions between these and non-farming communities (hunters and herders) generated the need for defence of property and, ultimately, to the consolidation of power through a combination of legitimation (law) and enforcement (war). Historically,

this occurs with the emergence of warrior societies from the late copper age, as witnessed by the building of fortresses all-across the Mediterranean from the 4th millennium BC. The complex relations between the domestication of plants and animals and the domestication of humans (as servants or enslaved people) led to a specific holistic approach to management.

A rapid increase in temperature and humidity after 11.700 years ago, at the end of the post-glacial period (Younger Dryas), generated dramatic changes in environmental conditions for human groups across the planet. The development of coastal and riverine resources, combined with the development of forests and associated fauna, offered excellent conditions for population growth all over the planet and, moreover, for them to resume past sedentary trials. By 9.000 b.P., several human sedentary villages existed, some having engaged in pottery production, or on sculpting, but none yet in food production.

A relatively short dry oscillation, circa 8.200 B.P., would become the first of a series of dry episodes (6.600, 5.600, etc.) that may now be perceived as having triggered major adaptive approaches from different groups. Those approaches, despite distances in time and space (Mediterranean, Southeast Asia, West Coast of Northern America, Mesoamerica, etc.) that stress the inexistence of any contacts among them, shared several common traits: intensification of the exploitation of available resources (namely through animal husbandry and later domestication of animals and grains), greater interaction exchanging resources among communities (trade, probably compensating a diminished mobility of the groups), development of group specific symbolic items (portable art, rock art, ritual performances), growingly different treatment of certain individuals (social ranking). This was a radical and global transition into a new era of humankind, economy of production, and occurred on occasions very fast (East Mediterranean) or in a gradual and slow pace lasting up to three or four millennia, during which farmers and hunters coexisted (Oosterbeek, Almeida & Garcês, 2014).

This is the sense of Socrates saying: *"It was an excellent saying of his who named husbandry the mother and nurse of all the arts," for while agriculture prospers all other arts like are vigorous and strong, but where the land is forced to remain desert, the spring that feeds the other arts is dried up; they dwindle, I had almost said, one and all, by land and sea"* (Xenophon, 1994).

Once societies made the choice of moving into a production mode, their demography grew but also their adaptive flexibility diminished. The need to design strategies to bridge the gap between needs and resources, initially secured by strong mobility (seasonal or nomadic patterns) of low demographic groups, became dependent on the control of the access to resources and their transportation. Then, the village evolves from a simple dwelling cluster close to the ploughed fields, to become an administrative centre regulating labour division, long distance exchanges, resources storage and armed security.

One important element of this process is the poor quality of arable land in most regions of the Mediterranean region. Early farming,

primarily dependent on the use of stone and wooden tools, had to be concentrated in light soils (Higgs & Jarman, 1969), with less productivity, and required the occupation of increasingly more extensive surfaces, integrating the management of a complex set of variables, from internal potential clashes of interests to external conflicts.

This is why regulating and encoding management became a need, through normative texts (law codes, religious prescriptions – certainly preceded by oral rules) and symbols of power (the temple as the core of power in the city). At the same time, the disruptive internal (social) and external (territorial) tensions lead to an awareness of lost community, generating a specific type of dialectics (leading to synthesis, i.e., to progress) and the identification of a meta-objective beyond those disruptions, capable of being perceived as a common aim: well-being, or *Eudaimonia*.

Hence the sentence of Socrates: *"For instance, what is a chorus? — a band composed of human beings, who dance and sing; but suppose the company proceed to act as each may chance — confusion follows; the spectacle has lost its charm. How different when each and all together act and recite with orderly precision, the limbs and voices keeping time and tune. Then, indeed, these same performers are worth seeing and worth hearing."* (Xenophon 1994). The seek for harmony, itself to be obtained through the widest satisfaction possible, becomes another important driver for management.

The Mediterranean model of expansion and economic growth based on poor soils and increasing surface domination, is initially based in land control and major public works for economic intensification. This is characteristic of pre-classic civilizations, largely dependent on water control, on what became known as the Asian mode of production (as originally suggested by Marx and later elaborated by authors like P. Andersen, 1974, or E. Mandel, 1971). The code of Hammurabi (Harper, 1904) is an expression of the management approach within such model, combining integrated total management through despotic rule and still a little consideration of contradiction beyond antithetic dialectics.

Further expansion of the city model of landscape management would lead to growing relevance of the management of exchange and production/distribution mechanisms (Witzel, 2012). This move, already announced in the later stages of the Assyrian or Egyptian empires, will experience a major breakthrough with the shift from land control to sea domination. Navigation skills of the Phoenicians combined with state complexity of the Greek cities, becomes the cradle of a new stage of management, in which circulation of products, more than possession of land, becomes the centre of wealth and power. The Greek/Punic/Roman models become based on a complex in which trade is the keyword. Management as the art of regulating such complex becomes primarily an investment not only for immediate needs (as in pre-classic land control complexes) but for future logistic sustainable control (hence, for a meta-real, which will become the notion of *Eudaimonia*). Trade, and profit based on increasing value through mobility of goods across different owners and through time, may be recognised as a material foundation of synthetic

dialectics, i.e., of the notion of progress. Such notion paves the way for an approach to overcome contradiction in a future, while valuing, or at least accepting, contradiction based on values in the present: this is the sense of the *agrapha nomoi,* as remarkably defined by Sophocles in Antigone (Oosterbeek, 2003).

Although keeping some traits of the pre-classic civilizations, the European approach to management will later become primarily influenced by the Greek/Roman understanding, which operated a sort of Cartesian duality: learning skills for the short term, while embedding them in values and meaning in the longer term. A duality that will be later resumed by Christianity. In this sense, classic European understanding of management can be considered as a liberal art framing of it.

The neglect of labour by upper classes, devoted to prayer (for happiness), war (to secure happiness) and thinking (to define happiness), may have worked as a good "way out" of the debate, leading to discuss the procedures in terms of responsibility, leadership and foresight (strategy). Yet, it is also worth noticing that the approach that values contradiction and the rule of law (instead of the rule of power) in management is primarily a characteristic of trade-based cities and periods, not so much of land-based or wartime ones. This is to be observed in the two traditions that will dominate the middle ages.

Saint Augustine first, in times of war, fostered an understanding of sovereignty based on justice (Pusey, 2010), itself rooted in transcendent will, i.e. on power, despite also resuming Socrates approach to wealth *("A "gift" is the thing itself, given by one who bestows life's necessities on another--such as money, food, drink, clothing, shelter, and aid. But "the fruit" is the good and right will of the giver."* – chapter XXVI of the *Confessions*). Management as such is not considered, since it does not relate to the City of God, but the principle is to take decisions based on moral prescriptions, interpreted by rulers.

Saint Thomas Aquinas, in times of a new dawn of trade, would stand for a different approach, taking reason as the reference for human action (even if, again, management itself was not discussed as such). Focusing on a teleological approach to human action, he would stress that no predefined rules may replace judgement based on practical reason, rooted in values, for decision making (Grassi, 2010).

Western approaches to management have, therefore, one trend which is absolute and tendentially despotic (or platonic) and another which is relative and tendentially understood as part of liberal arts. While the former tends to prevail in times of trade retreat or warfare, the second emerges when the core concern is to regulate trade economics. Words like power, force or belief tend to cluster with the first approach, whereas the second may be associated to words like argument, reason or democracy.

In modernity, with the questioning of socially inherited ranking, this debate became growingly regulated by ethical concerns, but it also became more detailed in terms of methodology and efficiency. This is the case of Machiavelli treaty "The Prince" (1992), for instance, inaugurating a new approach in which values are still

considered, but individual interest becomes fundamental. This is the sense of saying that *"(…) princes ought to leave affairs of reproach to the management of others, and keep those of grace in their own hands"* (Machiavelli, 1992 ed.). It was this approach that will lead, from the 19th century, to a business oriented dominant approach to management (Roberts, 2011). While the industrial revolution generated new management needs, the recurrent crisis of capitalisms led to finance control and the transformation of quality from being a liberal art into becoming a training skill related to business. But this will not occur before the end of the 19th century: when dealing with the consequences of the Great Depression of 1873-1996, Otto von Bismarck still used a combination of economic (industry shift), social (unions' rights recognition and social care) and cultural measures (religious tensions management), even if finances already pushed towards the paradigm of efficiency. Even the first world war, in which technological superiority became relevant but manpower was still the main resource, was still fought under the twofold approach of skills and values.

It would be the surprise of the stock exchange crash of 1929, and the resulting depression that would continue until 1946, that triggered the paradigm shift. Until then, even if private companies' management were steadily building a financial business model focused on profit alone, the public sphere was still based in the modern approach. Change would arrive with the transfer to the public sphere of the theories developed from the mid-18th century (Ferdous, 2016) by Frederick Taylor (with the notion of productivity and training for quality), Jules Henri Fayol (with the management flow process of planning, organizing, controlling, coordinating and commanding) and Max Weber (with the valuing of bureaucracy). This turn was made in order to prevent a new crash, considering that a fully liberal (in the physiocratic sense of the word) approach to society, without a strong State capable of regulating it, had become too dangerous.

World War II would then consolidate this turn, due to the need of budgetary control to win a war that, for the first time, was primarily fought in the technological front. Accumulation of wealth would then become the priority of management strategies.

This new business oriented approach to management works well for the first part of a sustainable development equation: securing proper technologies (through funding their costs) to retrieve and transform basic resources (mineral or human). But it faces growing difficulties when dealing with the dynamics of the matrix of sociocultural informal network (Oosterbeek, 2017) and, above al, with cultural differences (since it does not take into account the specificities of cultural diversity, and their specific values – Oosterbeek, 2010).

One may therefore state that the recent trends of business oriented management in Europe are disconnected with a liberal arts approach; yet, several dimensions of the understanding of management in Europe (e.g. human resources management) remain within such framework, and most of the traditional approaches to management from antiquity do fall within it. The current trend has broken with such tradition, having in any case improved in methodological terms. For these reasons, there is a common past ground with approaches to

management in Africa (e.g. the notion of Ubuntu), in Latin America (e.g. the Andean concept of "bien vivir") or Asia (taking management as a liberal art).

Seven: Environmental law or the right to the environment? A Cultural Integrated Landscape Management Perspective

I did not separate the political from the civilian laws at all: for as I do not treat all of the laws, but of the spirit of the laws, and as this spirit consists of the various relations that the laws may have with the various things, I had to follow less the natural order of laws than these relations and these things. (…) When one wants to change customs and manners, one should not change them by the laws; this would seem too tyrannical: it is better to change them with other customs and other ways (...); and it is a very bad policy to change by the laws what must be changed by the ways.

MONTESQUIEU, 1748

The world is the foundation and the scene in which the game of our aptitude unfolds. He is the soil upon which our knowledge is acquired and applied. But for the realization of what the understanding says to be necessary, it is necessary to know the constitution of the subject, otherwise what is said is impossible.

KANT, 1802

A legal bottleneck

Reality is always integrated, but our reflections and actions often resist this systemic nature, and Law in the sphere of the Environment is one of the expressions of this resistance, despite the dual influence of Montesquieu and Kant, who still dominate our conception of the rule of law and our understanding of the relationship between freedom and collective interest.

Montesquieu explains in his Spirit of Laws why, paradoxically, the worst places to live can be the best: less coveted, less likely to suffer from invasions and overpopulation, are more peaceful and allow greater stability to social dynamics.

This kind of dialectical paradox runs through all reality and our behavior, including its most complex ideological expressions: laws. Generally founded to prevent or correct facts or processes condemned by society, they tend later to constitute new blockades: it is not easy to condense into a text that the systemic, and therefore ever-changing, dimension of reality must be concretely applied.

The evolution of international and environmental legislation in the various countries follows from the 1960s the growing awareness of the limits and constraints of human action and its impact on the

environment. The atomic explosions that sealed the Second World War had still been perceived by the people of Western countries as a lesser evil, justified as necessary in the face of Nazi-fascist barbarism, and above all as something distant and affecting the enemy. However, the Cuban missile crisis in 1962 and the deepening of the Cold War have generalized fears of a regional or global catastrophe that could call into question the conditions for the survival of populations. This awareness was then deepened at the crossroads of social movements driven by the wars in the southern hemisphere (notably Vietnam), by the resistance to Soviet rule (notably the Prague Spring) and the emergence of a culture of middle class rights (which had its highest expression on May 1968 in France, but was expressed at many other times and events, such as the Woodstock festival itself in 1969).

The young people in 1970 were very different from their parents, and despite the barricades and street aggressions, they were more pacifist, they sought new understandings about the reality that confused and displeased them, and fought for universal rights that somehow resumed the Enlightenment spirit. It is in this process that they deepen less ethnocentric cultures and develop an interest in "the different" (what existed to the east or to the south), eagerly consuming studies of history and anthropology that illustrated the understanding of reality by non-Western or non-capitalist societies, not infrequently apprehended in a superficial and simplistic way. Their ways, to recall Montesquieu's expression, were different, and their program was to change the manners and behavioral patterns of society. After realizing the short-term failure of their attempts, they grew socially, in age, and demographically, and today they are power. Along the way, they built a new ecological consciousness that linked their social concerns (against exclusion and inequity) with their new understanding of the enormous environmental tensions to which the planet was being subjected (earth images from the moon and the generalization of images on television, showing several rupturing ecosystems, would accelerate this understanding).

The international conventions for the protection of the environment issuing from international conferences (Stockholm 1972, Rio de Janeiro 1992, ...) and the resulting laws were built as a legislative response to stem social, economic and environmental problems. This response was based on the affirmation of human rights (around the concept of healthy life) and of nation-states (around the concept of resources management), balanced with duties (about preserving the territorial and social rights of others, including the rights of future generations). In this context, the Rio Principles 13 (regarding liability and compensation for environmental damage) and 16 (known as the polluter pays principle) are of particular importance. This true charter of principles had the special merit of pushing legislation across countries, without which the planet would certainly be worse today. However, it is also consensual to say that, twenty years after the Rio Conference in 1992, it was not possible to halt, let alone reverse, the process of which we were already aware at the time.

We believe that there are three orders of reasons that explain the bitter, and for some discouraging, feelings within which the Rio + 20 conference was held.

First, the punitive logic about the citizen: although the polluter pays principle is inspired by noble motives, and can be efficient in relation to (business or other) organizations, from the late 1990s it became clear that, in addition to the catastrophic impacts generated by large enterprises, there is a slow, almost invisible, but not less serious, erosion that results from the patterns of individual consumption, which justified in legislative terms a growing penalization of citizens (the principle becomes, in practice, in a penalization of customs). Thus, an unjust logic has been constructed in the view of individuals, insofar as it clashes with their individual freedoms without guaranteeing them equally individual means of acting. The same is not true of companies, which on the one hand benefit from the profits of undertakings and, on the other, sometimes have a dimension that allows them to act on the environmental global scale.

Second, if public policies developed legislation and criminalization of environmental impacts, the creation of new processes (*ways* in Montesquieu's sentence) that ensure social equity through supporting new eco-sustainable behaviors was not equally effective. They forgot the advice of the French philosopher: laws do not change manners or customs, especially without tyranny. Although the social and economic dimensions were present in 1992, nothing was foreseen in terms of education and training (not surprising, given the nature and general objectives of UNESCO). There is thus an inefficient logic in the system of instruments built to implement the sustainable development model.

Thirdly, the strategies drawn two decades ago are based on an abstract conception of entities (economy, society, environment), deprived of contradictions (cultural, social or other), that is, outside reality. This is very clear in the main organizing instrument of society and the territory for sustainable development: Agenda 21. Although it foresees the valuation of minority social groups, its basic conception is that there are mainly problems to face that are of common interest, not glimpsing the contradictions and dilemmas that, in fact, are placed on public policies: the interests of some collide with those of others. Thus, an incomplete logic emerged from this construction of the sustainable development model.

In fact, the model of sustainable development assumes a systemic relationship between society, environment and economy, but the laws in the different countries, even inspired by this model, were culturally oriented essentially to one of these fields, according to their specific realities: valuing essentially the environmental preservation, without sufficiently taking care of the economic reality and, from its crisis, impairing social equity (the European Union is an example); sometimes taking care of the economy first, without sufficient attention to the environment or the social divide (China some years ago, the USA today). It is necessary to return to the systemic path, introducing into the "tripod of sustainability" a variable previously not considered (cultures and their perceptions) and a distinct questioning (focused not on problems to solve but on dilemmas to be resolved). Fostering the didactics of social dilemmas will be more and more the greatest challenge of the 21st century, because without their

understanding societies will not make the choices that the world economy today imposes (or will not do it within a democracy framework).

The rule of Law for Cultural Integrated Landscape Management

We exist in space, we perceive space, and only then, eventually, observing the transformations of space and in space, we infer the time (Levi and Segaud, 1983). That is why traditional societies have a notion of cyclical, reversible time, of eternal return: it is not easy for us to imagine what we cannot see, and we do not live long enough to see the irreversibility, except in our own lives. But memory (often mythical) of past generations tends to undervalue such irreversibility. Humans tend to evoke so-called great figures of the past, be them the heroes of Inconfidence in Brazil, the leadership of Mahatma Ghandi, the navigators of five centuries ago, the philosophers of classical antiquity, or the reindeer that, mythically, founded the lineage to which we belong – these founding myths unite and provide self-esteem of human groups, but also diminish own dimension and responsibilities, while compressing all the past into a collection of "achievements".

Space, then, is the setting where our skills flourish, as Kant said. And what do we do in this space? We establish relationships and carry out actions (Miranda / Meseguer / Ramirez 1986). Actions and relationships that are designed to meet our basic or culturally generated needs. The more complex a society is, i.e. the more memories and diversity it contains, the more needs it will have, and the more actions and energy it will require. The relationships and actions thus generated, which connect not only individuals with each other, but also with the environment, are what we call economy: the dynamics of seeking a balance between the individual needs and of each human group, with the need to preserve other living or inert materialities through time through a systemic balancing dynamics involving all the environmental variables, including humans and their societies.

These economic relations are, if within the same environmental and socio-historical framework, essentially the same, but there are many ways of rendering them, and this diversity of forms is what we call culture (Oosterbeek 2002). The amount of energy that our bodies lack, the functions of dwelling, feeding, transporting, storing or reproducing, are essentially the same for human groups of similar size in comparable environments; but the various groups will not act in the same way, for their historically generated memories give them distinct behaviors learned in the process of extrauterine growth. In this sense, it can be said that cultures are the economic relations mediated by socially shared memories. And law, to be adapted to the needs of society and the planet, must reflect this constantly changing, plastic, contradictory reality.

Part of the difficulties generated by the logic of current legislation is not only that it is sometimes perceived as unfair (despite growing awareness of environmental issues), but above all that it is majestic. Indeed, in the last two decades have been built very good legal instruments for the environment and social equity, and those have

been used to build other instruments (fiscal, for example) to strengthen them. In this endeavor, which certainly must be positively valued as already mentioned above (because it blocked or delayed many predatory processes), it was sought more to elaborate applied laws than conceptual and strategic Law. In this sense, there was less global legal elaboration, and more aggregation of norms and procedures.

The meaning of the term Law is that of the logical (originally theological) foundations and that of the coherence of norms derived from the foundations: its focus is in fact the philosophical roots that guide society, its manners and its mores. The judge interprets the law that follows from the principles, and the jurisprudence relies on these principles: it is their discussion that is relevant (Gusmão 1985). Legislation in the environmental sphere seems, however, to have followed the Anglo-Saxon understanding of the French term, where the term used is understood as a system of laws (Hart 1984), and in which the judge makes detailed, applied, laws in function of wider general laws and jurisprudence (in fact a tradition which has its origin in classical times and in the *mores*).

Perhaps because of the growing dominance of English in the international debates, and also in the sphere of UNESCO, it seems to us that law in the Latin sense was subordinated to a normative and punitive understanding (laws and their imposition), combined, but not essentially with jurisprudence (Law ensures flexibility by avoiding excessive normalization and relying on tradition) but with the Euro-continental normative tradition. Hence, speaking of Environmental Law, which is correct in terms of French-speaking *Droit* (it would be a question of starting from the reflection on the Man-Environment relation for the elaboration of laws), generates perverse understandings in the dominant framework of Anglophone Law (which, being centered on the citizen, should generate a right to the environment by humans).

Through this process the environmental legislation was separated from global legislation, building a huge legislative ghetto, which deserves the sympathy of a large part of the population in times of economic growth (the perception of depredation is accompanied by an improvement in social harmony) but is very vulnerable to majority opinion in times of crisis (such as the current one). Resuming the systemic unity of Law, building instruments that meet the environmental concerns in close coordination with economic, societal and cultural diversity, will be essential in the construction of new legal paths.

To reintegrate the environment into the systemic sphere of public policies implies, in the sphere of Law (and not just laws), the consideration of the concerns of societies and individuals, since they occupy in modern and contemporary logic the place once filled by God's will. The aim is to build an environmental Right based on the Right to the environment, that is, the use of the environment (of livelihoods) in a sustainable way (incorporating economic interests, social dynamics and environmental preservation itself, which is only a part, although greater, of the equation). This is what Rio + 20 came to recognize, by placing the social dimension as the starting and arrival point of all strategies: the main environmental problem on the planet continues to be hunger!

Sustainability issues, in addition to the reflections that led to international conventions and the diverse legislation in most countries, were also built on concrete scenarios of business development intervention whose protagonists became aware of the dispersion factors and rupture. This was particularly the case for the Carajás project (Batista 2010), which in its conception took care of the immediate surroundings in detail, but later was swallowed up by a growth without rule.

It is not possible to build sustainability islands, since economy being global also sustainability can only be ensured at large scales, which articulate socioeconomic planning and ecological strategies (Micarelli 2002) in a complex flow that we call Cultural Integrated Territory Management (CILM).

We emphasized above that the understanding of the terms society, environment and economy is cultural, varying in time, space and traditions. In constructing sustainability, our species builds logistic solutions (articulating needs and resources in space and time) from the understanding it makes (more or less scientific) of the territory. Technology has, in this reflexive process, a determining role: it allows individuals to control physical processes, understanding their immanent dimension. For the efficient construction of balanced solutions, the knowledge and awareness of the dilemmas that intersect the territories is important, enabling the informed construction of scenarios of future that can guide the action of each and every one. Thus, technology stands on the basis of conscious (participant) and trained citizens (with mastery of technology), while only with such citizens will become possible to build new governance solutions.

The CILM overcomes sterile debates on the options between growth and development (Oosterbeek / Scheunemann 2010) and builds a framework of discussion in which the teaching of dilemmas is the core element in raising the critical skills of individuals so that they can decide on our collective future. In this process, more than environment, the key-words are *territory* (the physical possibilities and constraints) and landscape (the perception of those possibilities and constraints).

In the sphere of Law this has great implications: to change the referent of one of the pillars of sustainability (the environment) to an integrating vector (the territory and its different landscape perceptions), to articulate this with strategies for training and education for critical judgment, to value the economy and sociology of the environment, ... building an integrated and proactive Law, beyond mere reactive protection laws.

Concluding invitation

Thirty years after the "Brundtland report", we need to recognize our planet stands in a more unstable and less sustainable position, despite all intentions. It became growingly clear that Sustainability is not a matter for technology and natural and social sciences alone, since cultural values, traditions, memories and learned diverse skills play a decisive role. Progressive interconnection across different disruptive features (environmental stress, terrorism, unemployment, xenophobia, and other) is an illustration all too dramatic to be ignored. The question is: can Humanities play a role other than of advice, or of promoting comparative studies?

Rio+20 Summit addressing poverty as the core issue of sustainability, called for a revision of the original concept, going beyond the so-called TRB. Yet, a new understanding needs to build from human cultural diversity and a new specific framework of reference is required, to address the challenges and to converge with other global initiatives, such as "Future Earth", the "International Year of Global Understanding" and the "World Humanities Conference".

Humanities are the base of an approach that will be able to address the challenges of Rio+20 and the Sustainable Development Goals, requiring bridging different scientific domains within a long-term approach and complex reasoning.

A transition program which will allow to build such a bridge includes: the consolidation of already existing networks; education and best practices for students' applied training in transdisciplinary innovative approaches to integrated cultural landscape management; intensive seminars on Cultural Integrated Landscape Management, rooted in academic knowledge and concrete territorial contexts; to undertake Humanities comparative studies in the field of sustainability; to publish essays, proceedings and media based materials.

A European strategic partnership (Apheleia/Ἀφέλεια) was structured since 2014 under the coordination of the Polytechnic Institute of Tomar, in Portugal, aiming at structuring a convergent set of tools to foster this. Apheleia became a step forward and found significant convergence with other avenues, namely the International Year of Global Understanding (IYGU) and the current strategy of the International Council for the Philosophy and Human Sciences (CIPSH), converging with the UNESCO program on Management of Social transformations (MOST) and strengthening conditions for building a truly global strategic tool, engaging several research and landscape management actors in the various continents.

Four related specific short-term objectives are: the establishment of a global research, education and innovation network, able to generate new knowledge, to apply it in real contexts and to communicate its outcomes and outputs; to demonstrate the specific use of the Humanities in daily life, namely by re-introducing mid and long term reasoning in society agendas and by stressing the need to integrate problem-solving activities within dilemma-facing strategic agendas that may make sense for people; to potentiate the impact of

knowledge production and knowledge sharing for overcoming the difficulties of society, particularly making use of digital and geo-referenced tools, participative science and a network of territories of applied tools; and to educate new generations of qualified leaders within a transdisciplinary and creative framework, that will also allow humanities to directly connect with natural and formal sciences, technology and the arts.

This agenda is currently structured as a proposed new UNESCO chair, on Humanities and Cultural Integrated Landscape Management (HUM.CILM), to be based at the Polytechnic Institute of Tomar and, namely, in its centre of Mação, where a CILM programme is running for over a decade. HUM.CILM brings together and will integrate different avenues of the work IPT and its partners have undertaken for the past almost 20 years: taught modules on CILM; Erasmus Mundus and previous research degrees in cultural landscapes and quaternary and prehistory studies; training courses in CILM for leaders; museology and cultural management projects in Mação and beyond in various continents; strategic European partnership Apheleia (which itself led to the establishment of a new European NGO); diffusion networking through IYGU; innovation and technology transfer; strategy to structure learning cities; international collaborations in Humanities, with CIPSH, UNESCO and other networks.

The chair is structured on the basis of a complex but already tested network of partnerships, out of which the only total novelty is the link with UNESCO chairs. It includes six clusters: European universities and research centres (8, from the Czech Republic, France, Italy, Germany, Portugal and Spain), Non-European universities and research centres (7, from Brazil, China, Senegal, Cabo Verde and India), Other UNESCO chairs (1 existing one, from Portugal, and 5 being proposed in Brazil, Cape Verde, China and Germany), Portuguese strategic partners (the National Commission of UNESCO and 4 regional strategic partners), International strategic partners (6, from Angola, Brazil, cape Verde, Italy, Lithuania, and Peru) and Global partners (CIPSH, HERITY, IYGU and UNESCO-MOST).

Through this very wide network different concrete territory-based CILM projects will be subject to exchanges across disciplines, countries and between the academic and the policy making spheres. The author hopes that the reader will, in some way, contribute to expand such network.

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