

**A CRITICAL ANALYSIS OF THE INTERNATIONAL  
STANDARDS FOR RESEARCH AND  
CONSERVATION OF PLEISTOCENE SITES:  
  
THE FUTURE OF THE GLOBAL HERITAGE OF  
HUMAN EVOLUTION**

**Dissertation**

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Nuria Sanz M.A.  
aus Madrid/Spanien

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Prof. Dr. Wolfgang Rosenstiel

1. Berichterstatter:

Prof. Nicholas J. Conard Ph.D.

2. Berichterstatter:

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# **A CRITICAL ANALYSIS OF THE INTERNATIONAL STANDARDS FOR RESEARCH AND CONSERVATION OF PLEISTOCENE SITES: THE FUTURE OF THE GLOBAL HERITAGE OF HUMAN EVOLUTION**

Executive summary

Nuria Sanz

As general coordinator of the UNESCO Thematic World Heritage Programme on *Human Evolution: dispersals, adaptations and social developments* (HEADS), I was responsible (2008-2018) for the guidance and management of a multilateral research platform ensuring in an interdisciplinary way the integrated preservation of the early sites related to the process of becoming human. The outcomes and recommendations formulated in this work result from a combination of my academic background as a prehistorian and my professional background as a civil servant of the United Nations, in which I specialized over the last 20 years in international cooperation for the conservation of natural and cultural heritage. This work revised the full spectrum of standard setting texts produced and adopted by the international community on heritage preservation and related matters over the last 70 years and justifies the confidence in the role of the World Heritage Convention of UNESCO in doing so. There is not a better instrument of international public law to merge natural and cultural heritages in an integrative multilateral approach and guidance, as does this unique legal framework, which encapsulates the complexity of our evolutionary heritage. However, the global scientific HEADS platform identified some gaps as well as possible improvements to be taken into consideration in order to apply the UNESCO 1972 Convention for the full benefit of the fragile and vulnerable physical conditions of our remote past. I analysed the full spectrum of the UNESCO decision-making process when examining new candidature proposals of sites not yet inscribed as well as the deliberations on the state of conservation of sites already inscribed on the World Heritage List. On the basis of the data elaborated and presented here, this dissertation proposes further recommendations and a clear applied research road map to be performed by the international community of researchers and policymakers based on the most recent discoveries and the state of the art of the collaboration between disciplines involved in human evolution research and preservation.

On the basis of a critical revision of the application of the criteria that justify the Outstanding Universal Value over time, this work discusses and identifies the need for a specific chapter in

the Operational Guidelines of the Convention related to Pleistocene sites and properties related to non-sedentary populations. The International community at UNESCO, guided by the most advanced research and conservation knowledge, should set up specific rules and categories for inscription and standards for the integrated preservation of Pleistocene sites. These pages illustrate how to channel the process to pass from Pleistocene knowledge to a Pleistocene heritage, and how to avoid the useless distinction between the arrays of heritages: immovable, movable, intangible, documentary or molecular when defining the very nature of a site related to our early past as humans. Finally, my dissertation invites the research and conservation communities to merge practices and to set up a collaborative dialogue in the interest of our long-term cultural evolution. This dissertation conceives the origins of our remotest cultural diversity as a human capital, which can guide our species on its journey through the enormous challenges toward climate change and artificial intelligence.

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I dedicate my dissertation to my parents, Rosario and Florentino, who educated my curiosity and to Viktor who since the beginning understood my passion and boosted my commitment to strengthening the links between academia and the diplomatic multilateral UN context.

I would like to thank Francesco Bandarin, as Director of the World Heritage Center of UNESCO, for his trust in my work and for his continuous support to HEADS as a tool for a better representation of the Prehistoric Heritage in the List. I am in debt with Ambassador María José Sansegundo for her engagement with the thematic project and her determination to convince the World Heritage Committee of the significance of dealing with the large timespan starting with the origins of our species. This dissertation has been supported by a multidisciplinary research community of more than 200 scholars that trusted the task of UNESCO and its role in involving science in the political decision making processes to better preserve our remotest past. Specially, I thank and recognize the remarkable role of the members of the scientific committee of HEADS: Professors Robin Dennell, Margherita Mussi, and Francois Semah. I am particularly thankful and indebted to Professor Nicholas Conard who persuaded me to go further in my research and to elaborate the basis of a second step of HEADS with this work.

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# **EINE KRITISCHE ANALYSE DER INTERNATIONALEN STANDARDS FÜR FORSCHUNG UND ERHALTUNG DER STÄTTEN DES PLEISTOZÄN: DIE ZUKUNFT DES WELTERBES MENSCHLICHER EVOLUTION**

Zusammenfassung/Executive Summary

Nuria Sanz

Als Gesamt-Koordinatorin des UNESCO Thematic World Heritage Programme on *Human Evolution: dispersals, adaptations and social developments* (HEADS), war ich von 2008-2018 verantwortlich für die Steuerung und Leitung einer multilateralen Forschungs-Plattform, deren Aufgabe es war, durch einen interdisziplinären Ansatz die umfassende Erhaltung jener frühen Stätten zu sichern, die mit dem Prozess der Menschwerdung in Beziehung stehen. Die Erkenntnisse und Empfehlungen der vorliegenden Arbeit sind das Ergebnis sowohl meines akademischen Werdegangs als Prähistorikerin als auch meiner beruflichen Tätigkeit als Beamtin der Vereinten Nationen, in der ich mich in den letzten 20 Jahren auf das Feld der internationalen Zusammenarbeit für die Erhaltung der Natur- und Kulturgüter spezialisiert habe. Die vorliegende Arbeit hat das gesamte Spektrum der Texte überprüft, in denen die internationale Gemeinschaft in den letzten 70 Jahren Standards für die Erhaltung des Welterbes und verwandter Bereiche gesetzt und angenommen hat, und bestätigt das Vertrauen in die diesbezügliche Rolle der UNESCO Welterbekonvention. Kein Instrument des Völkerrechts vermag es zutreffender, das Natur- und Kulturerbe in einem multilateralen, einheitlichen Ansatz zu vereinen, wie es dieser einzigartige Rechtsrahmen leistet, der die ganze Komplexität unseres evolutionären Erbes einschließt. Dennoch hat die weltweite Forschungs-Plattform HEADS einige Lücken und mögliche Verbesserungen identifiziert, die dazu beitragen können, die 1972er Konvention zum vollen Vorteil des fragilen und verletzlichen materiellen Zustands unserer fernen Vergangenheit anzuwenden. Ich habe die gesamte Bandbreite der Entscheidungsverfahren untersucht, die die UNESCO bei der Prüfung neuer, noch nicht eingetragener Kandidaturen anwendet, und die Beratungen über den Erhaltungszustand von Stätten, die bereits in die Liste des Weltkulturerbes eingetragen sind, verfolgt. Auf der Grundlage der hier ausgearbeiteten und vorgestellten Daten legt diese Dissertation weitere Empfehlungen und einen klaren Anwendungs-Fahrplan vor. Sie sollten durch die internationale Gemeinschaft der Forscher und Entscheidungsträger unter Einbeziehung der neuesten Entdeckungen und der aktuellsten Standards der Zusammenarbeit aller jener

Disziplinen implementiert werden, die sich mit der Erforschung und Erhaltung der menschlichen Evolution befassen.

Auf der Grundlage einer kritischen Überprüfung der Anwendung der Bewertungskriterien für die Annahme des Außergewöhnlichen Universellen Wertes im Zeitablauf diskutiert und identifiziert diese Arbeit den Bedarf für ein eigenes Kapitel in den operativen Richtlinien der Konvention über die Stätten des Pleistozäns und die Stätten, die zu nicht-sesshaften Populationen in Beziehung stehen. Die in der UNESCO versammelte Internationale Gemeinschaft sollte, geleitet von den modernsten Forschungs- und konservatorischen Erkenntnissen, spezifische Regeln und Kategorien für die Eintragung und Standards für die umfassende Erhaltung der Stätten des Pleistozäns festlegen. Diese Seiten zeigen auf, wie der Prozess eines Übergangs vom Wissen über das Pleistozän zu einem Pleistozän-Kulturerbe eingeleitet werden kann, und wie die fruchtlose Unterscheidung zwischen verschiedenen Feldern des Kulturerbes überwunden werden kann: hergebrachte Bezeichnungen wie beweglich, unbeweglich, immateriell, dokumentarisch oder molekular, die den eigentlichen Charakter einer Stätte definieren sollen, die zu unserer frühen Vergangenheit als Menschen in Beziehung steht. Schließlich lädt meine Dissertation die Forschungs- und konservatorische Gemeinschaft dazu ein, ihre Methoden zu verbinden und einen kooperativen Dialog im Interesse unserer langfristigen kulturellen Evolution zu führen. Diese Dissertation betrachtet die Ursprünge unserer entferntesten kulturellen Diversität als Humankapital, das unsere Spezies auf ihrem Weg zu enormen Herausforderungen wie Klimawandel und Künstliche Intelligenz leiten kann.

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Ich möchte Francesco Bandarin danken, der als Direktor des Weltkurerbe-Zentrums der UNESCO stets Vertrauen in meine Arbeit bewiesen hat, und der HEADS immer als ein Instrument für eine bessere Verkörperung des vorgeschichtlichen Kulturerbes begriffen hat. Ich stehe in der Schuld von Botschafterin María José Sansegundo wegen ihres Engagements

für dieses Projekt und ihrer Entschlossenheit, das Welterbe-Komitee von der Bedeutung zu überzeugen, sich mit dem langen Zeitabschnitt seit den Ursprüngen unserer Spezies zu befassen. Diese Dissertation ist von einer multidisziplinären Forschungsgemeinschaft von über 200 Wissenschaftler/innen unterstützt worden, die der Aufgabe und der Rolle von UNESCO vertraut haben, die Wissenschaft in die politischen Entscheidungsprozesse zur besseren Bewahrung unserer entferntesten Vergangenheit einzubeziehen. Ich danke in besonderer Weise für ihre außergewöhnliche Rolle den Mitgliedern des wissenschaftlichen Komitees von HEADS: Professoren Robin Dennell, Margherita Mussi und Francois Semah. Professor Nicholas Conard bin ich zu besonderem Dank verpflichtet, der mich überzeugt hat, meine Forschung fortzusetzen und mit der vorliegenden Arbeit die Grundlage für eine zweite Phase von HEADS auszuarbeiten.

Ich danke auch den Wissenschaftlern und Kollegen der Universität Tübingen: Jörg Linstaedter, Sibylle Wolf, Svenja Schray, Ewa Dutkiewicz, Jordi Serangeli, Johannes Krause, Mima Batalovic sowie meinen Kollegen der Complutense Universität Madrid : Alicia Torija and Manuel Domínguez Rodrigo. Die tägliche Arbeit von HEADS ruhte auf den Schultern von Rachel Lewis, Chantal Connaughton, Penelope Kennan, Dorian Rommens, Anjelica Young und Sarah Ranlett, ich danke ihnen für ihre unschätzbare Hilfe.

# A CRITICAL ANALYSIS OF THE INTERNATIONAL STANDARDS FOR RESEARCH AND CONSERVATION OF PLEISTOCENE SITES: THE FUTURE OF THE GLOBAL HERITAGE OF HUMAN EVOLUTION

## I) Introduction

This thesis is the product of my initial training as a prehistorian and a subsequent 20 years as an officer of the United Nations and related organisations, particularly UNESCO. As a scientist and a United Nations civil servant I can provide a unique perspective on human evolution from the role of international cooperation, in terms of creating a multilateral conscience of the need to preserve our precious heritage record of human evolution up to the 21<sup>st</sup> century. As such, I have been at the interface of scientific research into prehistoric sites and regions by using diplomatic and political skills at negotiation and the public dissemination of that knowledge to the general public at an international level. My starting point is that we need to adopt a multi-lateral approach as the most appropriate arena for assessing and presenting a global view of our human heritage for the entire timespan of human evolution. I refer here to my contributions on the institutional history of UNESCO, as shown by numerous publications and policy statements in the framework of the World Heritage Convention (WHC) (see Sanz, List of Publications for Cumulative Dissertation).

### **I.i Historical background of the World Heritage Convention (WHC) and the Operational Guidelines**

UNESCO is the umbrella organisation under which the World Heritage Convention is upheld and implemented. The background to the WHC was the destruction and damage of cultural monuments in WW2, and the realisation of their prospective vulnerability through development, urbanisation, the construction of large dams, agricultural development, and neglect as well as less easily controlled factors such as civil strife. UNESCO itself was a direct product of the United Nations charter of 1945, with a declared *purpose to contribute to peace and security by promoting collaboration among the nations through education, science and culture in order to further universal respect for justice, for the rule of law and for the human rights and fundamental freedoms which are affirmed for the peoples of the world, without distinction of race, sex, language or religion, by the Charter of the United Nations* (Art. 1 Constitution of UNESCO,

[https://www.ohchr.org/EN/Issues/Education/Training/Compilation/Pages/1.UNESCOConstitution\(1945\).aspx](https://www.ohchr.org/EN/Issues/Education/Training/Compilation/Pages/1.UNESCOConstitution(1945).aspx)). Amongst its many functions is protecting the world's cultural and natural heritage. The core document here is the Convention concerning the World Cultural and Natural Heritage that was adopted by UNESCO in 1972. A driving force behind it was the recognition that *the cultural heritage and the natural heritage are increasingly threatened with destruction not only by the traditional causes of decay, but also by changing social and economic conditions which aggravate the situation with even more formidable phenomena of damage or destruction* (World Heritage Convention, 1972, 10, <http://whc.unesco.org/uploads/activities/documents/activity-562-4.pdf>). There were two strands that led to its formation. The first addressed the cultural heritage. An important landmark here was the Venice Charter *for the Conservation and Restoration of Monuments and Sites* of 1964 that was adopted by the 2nd International Congress of Architects and Technicians of Historic Monuments, Venice, Italy, in 1964 to provide an international framework for the conservation and restoration of historic buildings. This led to the foundation of ICOMOS (International Council on Monuments and Sites) in Warsaw, Poland, in 1965. The second and parallel strand in the development of the World Heritage Convention was the establishment in 1948 by UNESCO, under the initiative of its first chairman, Julian Huxley, former DG of UNESCO, of the IUCN (International Union for the Conservation of Nature) to *influence, encourage and assist societies throughout the world to conserve nature and to ensure that any use of natural resources is equitable and ecologically sustainable* (<https://www.iucn.org/theme/global-policy/about>). Alongside these concerns was recognition of the fragility and vulnerability of landscapes and many rare endangered species in Africa, Amazonia and other regions, which led to the formation of the IUCN (see below). The idea of conserving natural sites internationally comes from the United States of America. As officially stated: *A White House Conference in Washington, D.C., USA, in 1965 called for a 'World Heritage Trust' that would stimulate international cooperation to protect 'the world's superb natural and scenic areas and historic sites for the present and the future of the entire world citizenry'. In 1968, IUCN developed similar proposals for its members. These proposals were presented to the 1972 United Nations conference on Human Environment in Stockholm, Sweden* (World Heritage Information Kit 2009, 7). The resulting Declaration of the United Nations Conference on the Human Environment (also known as the Stockholm Declaration) in 1972 was an important milestone in international law to promote the recognition of a healthy environment. The IUCN is perhaps best known to the public for its annual list of endangered species and has always played a major role in nature conservation. Since the inception of the

WHC, these two organizations have tried to merge their criteria in the case of mixed World Heritage sites (for example, the Ngorongoro Conservation Area, Tanzania (*Fig. 1*)) and some common ground has been established by *Connecting Practises* programme, [https://www.iucn.org/sites/dev/files/content/documents/connecting\\_practice\\_report\\_iucn\\_icos.pdf](https://www.iucn.org/sites/dev/files/content/documents/connecting_practice_report_iucn_icos.pdf).

Success has been limited, as only 39 sites have been classed as mixed out of a total of 1,121. Moreover, since 1994 the natural criteria of the Operational Guidelines did not include interaction between natural and cultural environments. As a result, the nature of Pleistocene sites needs a further elaboration on how to use WH criteria to justify the Outstanding Universal Value (OUV) of sites related to Human Evolution. The HEADS programme has provided the most appropriate arena to consider criteria viii (see below) as a suitable environment to enlarge the discussions of the international research community to justify the unique character of the heritage of becoming humans.

*A judged by the international community, the Convention is one of the most successful of all international instruments in the conservation of heritage sites. This success is reflected not only by the number of signatories, with coverage being nearly universal (193 of UNESCO's 193 Member States), but also by the large number of protected properties (1211 properties in 167 countries as of July 12<sup>th</sup>, 2019) (updated from Sanz 2011, 16).*

At present, our perception of World Heritage is overwhelmingly about the last five thousand years of human existence. At the last count, there are over 1,000 sites with World Heritage status, but fewer than 10 relate specifically to human evolution. Of the 1,211 World Heritage Sites recognised in July 2019, a disproportionately large number are in Europe. Italy has the largest number, with 55; China, with its far larger area and equally long history, has 54. Italy has more than the whole of Africa, which has only 51. France, with 45 cultural World Heritage Sites, has the same number as the whole of Southeast Asia (Indonesia, Vietnam, Thailand, Philippines, Malaysia, Myanmar, Cambodia, Singapore, and Laos), more than India, which has 38, and more than the whole of South America, which has 36 cultural sites. Most importantly with regard to this thesis, human evolution is a global story that involves every continent except Antarctica and 99% of our timespan on this planet yet is scarcely recognised as part of our human heritage in terms of the World Heritage Convention. My work seeks to redress these imbalances.

# Ngorongoro Conservation Area (Tanzania): factors affecting the site

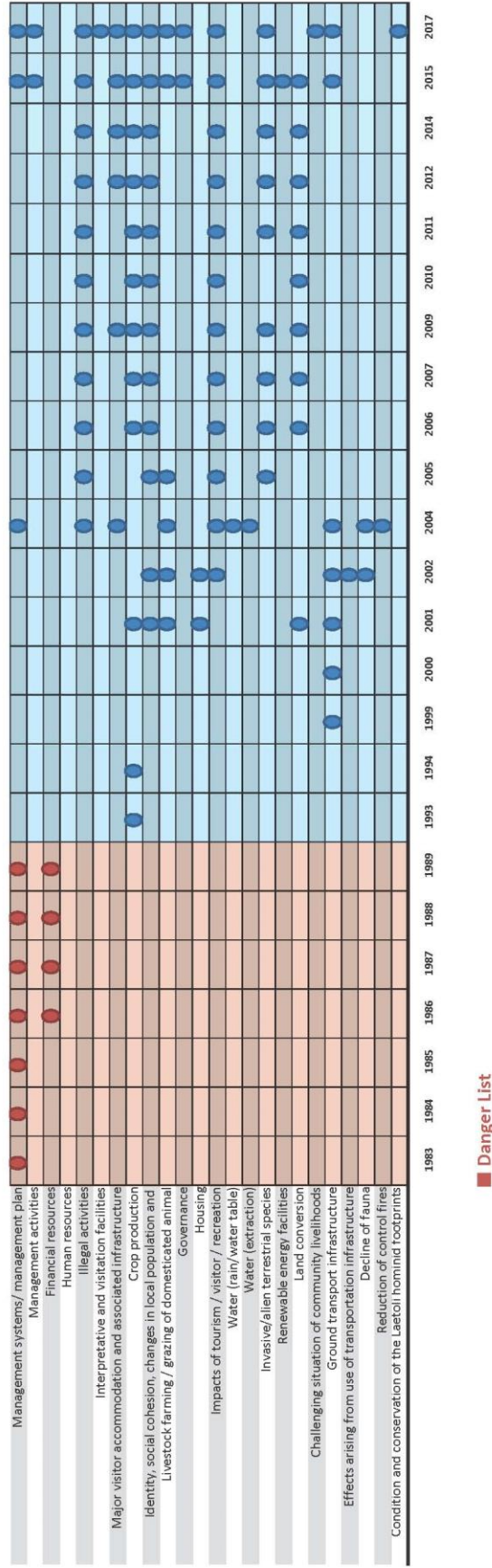


Fig. 1: Ngorongoro Conservation Area (Tanzania): factors affecting the site (elaborated by Nuria Sanz, source: <https://whc.unesco.org/en/list/>).



### **I.ii. Short-comings of World Heritage status**

The ideals of the World Heritage Convention have not always been realised. Overall, most would agree that the policy of awarding sites, monuments and cultural phenomena with World Heritage status has been a success story in multilateral terms and for public education and conservation purposes. There have been obvious failures, as the destruction of the Old City of Aleppo and some of the monuments at Palmyra, Syria, and the destruction by the Islamic State of the contents of Mosul Museum, Iraq. The failure to prevent these lies with the war's destructive character and the decisions of the international community, especially of the belligerents, but not with the role that the UNESCO 72 Convention has and has been playing over more than 4 decades. Other regrettable developments were the deletion from the World Heritage list of the Oryx Sanctuary, Oman, and of the cultural landscape of Dresden, Germany, because of non-compliance by the State Parties.

### **I.iii. Threats to World Heritage**

From the outset, the 1972 Convention concerning the World Cultural and Natural Heritage recognised that both cultural and natural heritage are fragile and vulnerable. In the 1960's, the main threats to cultural heritage were increased industrial pollution, unregulated urban expansion and redevelopment, unregulated or poorly regulated protection of historic monuments and the threat of destruction by warfare. National policies on mining privilege the economic and industrial value of the subsoil. Major infrastructures developing African and Asian countries are the most destructive force for our human earliest history. Climate change is another and growing threat; for example, rising sea levels caused by climate change are threatening many coastal heritage areas, some of them related to the first arrivals of human beings in islands environment. Threats to natural heritage were recognised immediately following the Second World War such as the destruction of forests for logging and agriculture, the global expansion of agro-business and the consequent loss of biodiversity, unregulated pastoralism, man-made desertification and pollution of lakes, rivers and the sea. In some situations – such as temple sites in India and Southeast Asia – endangered species of primates are residents of the monument or its vicinity. Civil war in Central Africa threatens the survival of gorillas, chimpanzees as well as their habitat as in the case of Virunga, Democratic Republic of Congo.

## **II. Human evolution and the UNESCO Convention for the Protection of the World Cultural and Natural Heritage**

This section includes some statements previously framed in HEADS Volume 1, formulated as the basis of HEADS collective endeavour: *The mission of the UNESCO World Heritage Centre is to protect natural and cultural heritage, work with States Parties to implement the World Heritage Convention on their national territory and secure all possible forms of international cooperation, as laid down in the text of the 1972 Convention.*

*The ultimate goal of the World Heritage List is to include all forms of cultural and natural diversity that are of Outstanding Universal Value (OUV) in the world. The earliest cultural stages of human evolution cover a long period that is vital to the history of humanity, reflecting the origins of cultural diversity. However, as pointed out above, the importance of this process is not matched by its representation in the UNESCO World Heritage List (Sanz 2011, 15).*

*The World Heritage List initially rested on a ‘monument-based’ conception of cultural heritage, but in recent decades people’s perception and interpretation of the history of human societies, scientific knowledge and intellectual attitudes towards the idea of cultural and natural heritage have undergone change, as has the way in which societies perceive themselves, their values, their history and their past relations with other societies and cultures. In 1972, the concept of cultural heritage was largely confined to the built heritage, architectural fabrics, exceptional sites in terms of scale and monumental character (Sanz 2011, 16). However, the history of art, architecture, archaeology, anthropology and ethnology, ecology and genetics have since been moving away from the study of isolated monuments and have begun to take complex, multidimensional cultural phenomena into account. By adopting its Global Strategy in 1994, the World Heritage Committee sought to broaden the definition of ‘World Heritage’ in order to reflect the full diversity of the planet’s cultural and natural wealth more effectively, while establishing a global framework and an operating methodology so that the Convention can be implemented to the full (Sanz 2011, 16).*

*To ensure that the future World Heritage List would be representative, balanced and credible, the group of experts convened on that occasion considered not only that the number of under-represented cultural properties by type, by region and by period should be increased, but also that the new heritage concepts that had arisen in recent decades should be taken into account (Sanz 2011, 16).*

Inspired by this process, *in August 2008, the World Heritage Centre initiated a study of prehistoric sites included in the World Heritage List and Tentative List and drafted some documents for subsequent analysis thereof. In its endeavour to continue to raise the level of representation of under-represented categories and to improve geographical coverage, the World Heritage Committee adopted Decision 32 COM/10A at its 32nd session, held in Quebec City, Canada, in July 2008. In that Decision, the Committee called for research on the presence and potential of cultural representations linked to prehistoric archaeology to be initiated under the Global Strategy for a Representative, Balanced and Credible World Heritage List and co-ordinated by the World Heritage Centre of UNESCO (as reflected in the list of publications for this cumulative dissertation) under my direction (Sanz 2011, 16).*

*The World Heritage Committee officially adopted the Thematic Programme in Seville, Spain, in 2009. More than 19 international meetings have been held in the last ten years on the basis of those considerations, thus affording the scientific community, governments and civil society opportunities to express themselves and set priorities for the drafting of the Action Plan on Human Evolution: Adaptations, Dispersals and Social Developments (HEADS), which was submitted to and approved by the World Heritage Committee in Brasilia, Brazil, in 2010 (Decision 34 COM 5F 1, 3). The process, initiated in 2008 when Spain chaired the World Heritage Committee, yielded its first results when the Committee recognized the potential and urgent need for the formulation of a specific thematic programme on the earliest stages of our anatomical and cultural diversity (Annex I, 1. World Heritage List, 2. Tentative WH List, informs about the status of nominations related to Pleistocene and Hunter-Gatherer communities, meaning non sedentary communities for the purpose of this study, elaborated by N. Sanz, source World Heritage List, from: <https://whc.unesco.org/en/list/?delisted=1>).*

As the focus of the HEADS programme is the Pleistocene record for human evolution and the Palaeolithic, it is necessary to define the Pleistocene.

### **II.i. Definition of the Pleistocene and its principal subdivisions**

The Quaternary geological period consists of the Pleistocene and the present interglacial known as the Holocene. The boundary of the Pliocene with the Pleistocene is *defined by the Global Stratotype Section and Point (GSSP) of the Gelasian Stage at Monte San Nicola in Sicily, Italy, and is currently dated at 2.58 Ma at the Gauss-Matuyama palaeomagnetic boundary and coinciding with Marine Isotope Stage 103, according to the INQUA and ICS debates*

(<https://linknovate.com/affiliation/brock-university-42543/all/?query=quaternary+period>).

(Finney, 2010; Gibbard and Head 2010; Gibbard et al. 2010). In global terms, the re-definition of the Plio-Pleistocene boundary marks also the onset of loess deposition in North China (Ding et al. 2000) and Central Asia (Dodonov and Baiguzina, 1995) and also the onset of ice-rafted debris into the North Atlantic (Shackleton et al. 1984). It also encompasses most of the evolution of our own genus *Homo* (for which the earliest skeletal specimen is dated at 2.8 Ma (Villmoare 2015; Villmoare et al. 2015) and the earliest examples of the flaking of stone to produce sharp flakes at ca. 2.6 Ma (Semaw et al. 2003). The new dating therefore replaces the earlier definition of the onset of the Pleistocene that was defined from the section at Vrica, southern Italy (Tauxe et al. 1983) by the first incursion of cold-tolerant mollusca into the Mediterranean at ca. 1.8 Ma.

Important localities that are now placed in the Pleistocene as a result of the re-definition of this period include Lokalalei, Kenya (2.3 Ma-old) (Roche et al. 1999) and the earliest artefacts from the Loess Plateau, China (Zhu et al. 2018). Major Early Pleistocene sites not affected by this definition include those in the Nihewan Basin, North China (Zhu et al. 2001, 2004) and Dmanisi, Georgia (Ferring et al. 2011; Gabunia et al. 2000).

The Middle Pleistocene differs from the Early (Lower) Pleistocene by the gradual transition from several short and mild climatic changes to a few long and severe episodes that are defined by a series of ice ages in northern Europe and North America. In formal terms, the Middle Pleistocene Transition (MPT) encompasses Marine Isotope Stage (MIS) 36 (c. 1.2 Ma) to MIS 13 (c. 540-460 Ma), of which the cold stage MIS 22 (c. 880-870 ka) is perhaps the most severe. On practical grounds the beginning of the Middle Pleistocene is usually set at the Brunhes-Matuyama palaeomagnetic boundary at ca. 0.78 Ma as this can be recognised globally in oceanic and many terrestrial sequences (Head and Gibbard 2005).

There are numerous Middle Palaeolithic sites that are important information sources about human evolution and competence. These include Schöningen, Germany, (Thieme 1997; Starkovich and Conard 2015), Boxgrove, UK (Roberts and Parfitt 1999) and locality 1, Zhoukoudian, China (Lanpo et Weiwen 1990).

The Late (Upper) Pleistocene is defined by the onset of the last interglacial, which is known as the Eemian in northwest Europe and considered equivalent to Marine Isotope Stage 5 in the

oceanic record. The Global Stratotype Section and Point (GSSP) for the base of the Upper (Late) Pleistocene Subseries (Quaternary System/Period) is a high-resolution core sequence from the Amsterdam Terminal borehole, the Netherlands. In Europe, the date of 127.2 ka from the varied-dated record of Monticchio, Italy, can be taken as the best estimate of age for the beginning of the Eemian interglacial (Gibbard 2003; Litt and Gibbard 2008). Major Late (Upper) Pleistocene sites include most Neanderthal ones, the entire Upper Palaeolithic of Europe and southwest Asia, the cave of Niah, Borneo (Barker 2013) and the Pleistocene record of Australia.

The end of the Pleistocene and beginning of the Holocene is fairly arbitrary but the internationally-accepted boundary is the first sign of climatic warming at the end of the Younger Dryas/Greenland Stadial 1 cold phase at 11,700 BP, as seen in the Greenland/NorthGrip (NGRIP) ice core (Walker et al. 2008). It is in this period that the first indications are seen of the emergence of farming societies in southwest Asia (Sanz 2016).

### **II.ii. Human evolutionary studies and the World Heritage Convention**

Although human evolutionary studies and Palaeolithic research have had little contact with the World Heritage Convention, they need to be seen as mutually supportive. Human evolutionary studies and Palaeolithic archaeology can benefit greatly if the most significant outcomes of their research are ascribed with World Heritage status for ensuring the future research at the site, and conversely, the World Heritage list can benefit greatly by their inclusion to fulfil its mandate to merge culture and nature.

### **II.iii. The benefits of World Heritage**

Highlighting the importance of human evolutionary and Palaeolithic archaeology provides a way of broadening the horizons of the general public and enhancing their understanding and appreciation of our deep past; international tourism is a powerful way of promoting greater tolerance and understanding of different communities; and human evolution is a topic of enormous public interest in magazines, books, TV and the media in general. The study of human evolution over timescales of several million years also provides a unique long-term perspective on humanity that can help reinforce the notion of a single, undivided humanity that underlies the numerous divisions in the contemporary and often divided world, whether at the

level of the UN, national governments or the individual citizen. This potentially provides a powerful way of promoting unity of resolve in the current age in which global climate change is one of the main threats to our continuing existence and prosperity.

Palaeolithic archaeologists and human evolutionary specialists are normally more concerned with their own research field than with the World Heritage convention. Yet there are benefits for researchers if the World Heritage list is expanded to include a larger number of human evolution and related sites. First, it provides a highly visible way of showing the public why our evolution is worth studying. Second, palaeoanthropology is funded in most countries from general taxation as well as (especially in the US and Britain) by wealthy donors, and the public as well as the donors like to feel that their money is well spent. Thirdly, an educated public is more likely to protest if our human heritage is threatened by developments such as hydro-dams, open mining, air pollution and other factors; an educated public is also more likely to report an accidental new discovery that might otherwise go unnoticed. The development of a “knowledge heritage” among children and adults is an intangible but potentially powerful resource that better equips us to deal with the problems of the present and potential problems of the future. An important aspect of a “knowledge heritage” is to ensure that evidence of the human past is not deliberately destroyed on the grounds that it is pre-Islamic, as has happened recently in Afghanistan, Iraq and Syria.

#### **II.iv. A fresh start and the HEADS Thematic Programme**

The HEADS programme was launched in 2009 in order to widen the World Heritage list to include sites related to biological and cultural processes to become human. Its first meeting was in Burgos, Spain, in 2009, followed by one in Addis Ababa, Ethiopia, in 2011, Jeongkok (Democratic People’s Republic of Korea) in 2012, Tubingen, Germany, in 2013, Puebla, Mexico, in 2014, and Xalapa, Mexico, in 2015. These meetings convened technical and scientific experts and government representatives and discussed respectively the evidence for human evolution in Africa, Asia, Eurasia, the Americas, rainforest archaeology and origins of food production, and resulted in several UNESCO volumes (Sanz (ed.) 2011, 2012, 2014, 2015, 2016, 2017).

Before embarking on the task of widening the World Heritage list to include sites relating to human evolution, a first requirement was to establish a unifying narrative for human evolution

that was consistent with the ethos of UNESCO. As formulated since the beginning of HEADS programme: international cooperation was key to the narrative of becoming human. *It is a means of investigating ourselves and requires us to seek out our remotest origins, with the nature of our present existence as the starting point. The aim, then, was to understand how we emerged as the genus Homo and later as the species Homo sapiens; how and when we colonised the entire world; and how we can show the origins and development of different forms of knowledge and reasoning, cosmologies and moralities, which have shared origins but took different paths of development.* The main purpose of this work is focused on how we could *use its heritage as a means of preserving the knowledge of everything that has led us from our Pleistocene background to become what we are today* (Sanz 2011, 16, revisited).

UNESCO rightly plays a central role in promoting and maintaining the notion of a global cultural and natural heritage. In promoting the idea of a World Heritage in a post-colonial globalised world, it is vital to expand a narrative that emphasises the unity, adaptability and diversity of humankind. The narrative is inclusive by nature, as a matter of principle, by showing that all countries and peoples are the product of that unity by adaptability and diversity. In an age where identity is a crucial factor in the way people define themselves and their neighbours, it is entirely appropriate that those identities are seen as part of that ONE human history in its diversity as our most fundamental intertwined and interlinked human family heritage.

*The results of the first few international meetings alerted us to various needs that should be met under the Programme* (Sanz 2011, 16, 18-19, revisited):

- *the need to focus on cognition, to analyse how modern humans dealt with choices and how hundreds and thousands of years of observing nature have made it possible to turn challenges into forms of adaptive security;*
- *evidence of the past existence of many epicentres of human creativity and the need to avoid identifying the most ancient as the most outstanding – the point here is to give significance to these chronological landmarks when they also bring out the plural and diverse character of phenomena, especially as the cradle of humanity is always a cradle on wheels and the origins can always be sought further and further back;*
- *the need to find in the records, even the least visible of them, the will to leave the mark of different forms of human presence in a territorialized space;*

- *the world's best-studied palaeolithic archaeological sites have not been included in the national Tentative Lists or the World Heritage List; the sites that feature most prominently in the scientific literature, namely Caune de l'Arago, France, Dolni Vestonice, Czech Republic, Fumane, Italy, Isernia La Pineta, Italy, Kostienki, Russian Federation, among others, being conspicuous omissions; the best-studied sites have not always been considered in the analysis of the OUV;*
- *the need to establish methodological and ethical standards and guidelines for research and action relating to the preservation of some depositional forms, such as in caves;*
- *the need for the Convention's day-to-day operations to include forms of taphonomic analysis and thus new methods of analysis to halt the deterioration of sites excavated a long time ago, whose records can now yield much more information if they are analysed by means of the full scientific battery of modern practices;*
- *the need to identify the best means of providing for the integrated conservation of immovable and movable heritage in sites where form and content are inseparable for the purposes of defining OUV, justifying and preserving their conditions of authenticity and integrity;*
- *the potential for turning the World Heritage Convention into a tool for guaranteeing the production and transmission of knowledge about what makes us human;*
- *the need to develop working assumptions, to explore opportunities and categories such as serial properties and mixed sites more effectively and to examine the human aspect in greater depth, as per criterion (viii);*
- *to rethink how the physicality of sites from our remotest history could fit into the World Heritage criteria and to build working assumptions for rethinking such concepts as territory, migration and iteration.*

As agreed by the Scientific Committee in 2010: *Heritage sites connected with 'human evolution' are properties relating to natural and human processes in the human lineage. Processes relating to human evolution include biological and cultural changes that attest to the remarkable success of our predecessors, who adapted constantly to the changing circumstances of their environment and whose dispersal throughout the world is proof of their adeptness at surviving even under the most extreme conditions.*

*Spread over several million years, the heritage of human evolution narrates the emergence of human anatomical, cognitive and behavioural characteristics. It therefore helps us to appraise*



*diachronically the biological and sociocultural characteristics inherent in the extraordinary unity and diversity of our species, its wealth of behaviour and our ability to modify and artificialize our own surroundings.*

*'Human evolution' accounts for the origins of human life and social development from their beginnings. The processes involved may date back to the earliest forebears of humanity's lineages and include the production of tools for the last 3.3 million years (Harmand et al. 2015); when the HEADS Thematic Programme began, the earliest evidence for tool-making was ca. 2.6 Ma-old from Kadar Gona, Ethiopia (Semaw et al. 2003). We believe that this record is an extremely valuable one, as it represents our inherited store of knowledge about the bases and diversity of human life, experience and social behaviour.*

*Related sites contain evidence of the natural and cultural processes of human lineages as part of the record of life and history on Earth. Consequently, sites relating to human evolution are also geological and paleontological properties for the purpose of establishing the site's OUV. Processes relating to human evolution include biological and cultural changes at testing to the remarkable success of our predecessors, who adapted constantly to changing environmental circumstances and whose dispersal throughout the planet proves their adeptness at surviving even under the most extreme conditions. It is therefore vitally important to take an interdisciplinary approach to the study of such properties, situated as they are at the crossroads of the natural and cultural heritage, so that they can be interpreted and their authenticity and integrity properly appraised.*

*The associated sites encompass 99% of the timeline of human existence and many innovations in culture, behaviour, adaptation and technology that have set the future course for humanity as we know it today. This long process transformed human experience gradually and has been marked throughout by a multiplicity of responses, ranging from the hunter-gatherer's way of life to the present day when, for the first time in history, the majority of humankind lives in an artificially constructed city environment, while some modern hunter-gatherer communities continue to live in modern peri-urban areas. The question thus arises as to the conditions required to preserve those ways of life, themselves the best outcome of a more successful form of subsistence (Sanz 2011, 20).*

*Throughout this extremely long time-span, human lineages repeatedly displayed a remarkable adaptability that enabled them to spread from the tropics to a wide variety of constantly changing environments, from the equatorial regions to the Arctic, from the continents to islands, from low-lands to high regions, from deserts to swamps. The diversity of the human heritage is highlighted at archaeological sites all over the world, which preserve the invaluable record of humanity's earliest history (Sanz 2011, 21).*

*As previously stated, the scientific standards necessary for providing a definition of OUV were discussed; the need to develop research applied to the preservation of these extremely vulnerable sites was highlighted; courses of action were identified which would enhance international cooperation in the procedures for submitting candidatures for the World Heritage List; the most exceptional thematic narratives for improving the representation of these sites within the framework of the World Heritage Global Strategy were established; and recommendations were made to the States Parties to the Convention, to ensure the setting up of multidisciplinary teams and tasks in order to establish an adequate justification of criteria and conditions of authenticity and integrity of paleo-ecological /archaeological environments. After careful analysis of already inscribed sites as well as those on the Tentative List relating to human evolution, the experts defined the following priorities: to move forward in our reflection about humankind's oldest ancestors, our adaptive ability to harsh environmental and climate changes, especially between 2.6, 1.8 and 0.13 Ma ago and the evidence regarding adaptation to the last glacial maximum (LGM) (Sanz 2012, 8).*

As formerly formulated, according to the agreement raised by the HEADS Scientific Committee, *the main objectives of the Thematic Programme are to (Sanz 2011, 22, revisited):*

- *forge links between scientific research and conservation by achieving recognition of the scientific value of properties linked to human evolution;*
- *act under the Global Strategy initiated by the World Heritage Committee in 1994 to broaden the definition of 'World Heritage' in order to contribute to the equitable representation of all the natural and cultural diversity of our planet since its origins;*
- *achieve recognition for sites containing important traces of interaction, dating back to the earliest times, between humans and the earth, early cultural behaviour, cognitive*

*milestones and creative expressions;*

- *preserve listed properties from gradual deterioration on account of their antiquity and the vulnerability of their component materials;*
- *preserve the future research potential of records.*
- transform Pleistocene data into Pleistocene heritage

Three problems emerged from discussions at these meetings. The first, which arose at the Addis Ababa, Ethiopia, meeting in 2010, was the matter of periodization: what date should be used to define the concept of “human evolution”? The second that was general to all meetings was the definition of a “site” or property; and the third stems from the fact that palaeoanthropology is a very fast-moving field in which our understanding of our remote past changes by the year and even month. The fourth, and perhaps the most serious, is whether the Operational Guidelines of the WHC are appropriate for the type of evidence that demonstrates our evolution. To take each in turn:

### **III) From Pleistocene Science to Pleistocene Heritage**

#### **The time-span of human evolution**

Our evolution as a lineage distinct from the ancestors of our closest relatives, the gorilla, chimpanzee and bonobo began in the late Miocene ca. 7-8 Ma. Genetic analysis indicates that we are most closely related to the extinct African apes, and the African apes (including ourselves) are genetically distinct from the orang-utan, which is now the only Asian ape. As a group, humans, gorillas, chimpanzees and bonobos are classified as hominids, and our own lineage is known as the hominin. There is little fossil evidence to indicate the first hominins, but the main specimens are those of a cranium of *Tchadanthropus sahelensis* from Chad (Brunet et al. 2002) and post-cranial fragments classed as *Orrorin tugenensis* from the Tugen Hills, Kenya (Senut et al. 2001).

Between three and four million years ago, there are numerous examples of the precursors of our own genus that are mostly classified as a form of *Australopithecus*, of which the first was recognised by the discovery of a juvenile cranium from Taung, South Africa, in 1924 by

Raymond Dart. Since then, numerous species of *Australopithecus* have been recognised in East and South Africa, of which the most famous is probably the partial skeleton of *A. afarensis*, ca. 3.3 Ma-old from the Afar Triangle, Ethiopia, and better-known as Lucy (Johansen and White 1979). Most of our evolution as the genus *Homo* and later *Homo sapiens*, occurred during the Pleistocene. The earliest stone artefacts so far recorded are ca. 3.3 Ma ago and were found at Lomekwi in Kenya (Harmand et al. 2015). These were mainly flakes struck from very large nodules of rock, which may also have been used for pounding food resources such as nuts. As the earliest evidence for our own genus *Homo* is a mandible from Ledu-Geraru, Ethiopia, dated at 2.8 Ma (Villmoare et al. 2015), the Lomekwi artefacts were likely flaked by a species of *Australopithecus*, of which several types are known in East and South Africa before 3 Ma. A more significant innovation was the ability to flake repetitively *sharp conchoidal flakes that could be used for cutting meat* (Dennell 2015a, 9) from carcasses, whittling work, or scraping. The earliest of these date from ca. 2.6 Ma at Kada Gona, Ethiopia, (Semaw et al. 2003) and were likely flaked by an early form of our genus. By the onset of the Pleistocene, our remote ancestors had already mastered an essential skill of being able to use stone as a way of obtaining high-quality animal protein from carcasses before these were consumed by rival predators. Cut-marks on bones from Bouri, Ethiopia, that resulted from the use of sharp stone flakes show that our ancestors already had that ability by 2.5 Ma-ago (Heinzelin et al. 1999).

Our evolution over the last 2.5 Ma took place under conditions that were very different from those we have been experiencing in the present interglacial period that began ca. 12,000 years ago (see above). This is demonstrated by numerous Palaeolithic sites in Africa, Asia and Europe, including the much smaller number that preserved human skeletal remains. The hunter-gatherer-forager populations that still exist in Africa, the Americas, Australia and the Arctic are the last representatives of a way of life that emerged hundreds of millennia ago, and deserve recognition within that long-term perspective.

The main landmark familiar to any student of palaeoanthropology is that an early form of our genus usually known as *Homo erectus* left Africa and colonised Asia and Europe. Until 2000, this was thought to have first occurred ca. 1.85 Ma-ago (and evidenced by the stone tools and hominin remains from Dmanisi, Georgia, (Ferring et al. 2011; Gabunia et al. 2000) but recent evidence from the Loess Plateau of Central China now indicates that this process may have begun as early as 2.1 Ma-ago (Zhu et al. 2018). Another major landmark in palaeoanthropology occurred ca. 800-600,000 years ago when the earth's climate changed from one of numerous

but generally mild climatic changes to one in which there were a small number of long and very severe cold episodes associated with the growth of ice sheets over North America and Europe (see above). Its importance is that these ice ages presented enormous challenges to hominins, especially those in northern latitudes.

The best-known extinct hominin associated with the Ice Ages are the Neanderthals, which emerged in Europe ca. 300,000 years ago; our own species *Homo sapiens* is most likely African in origin. Until the 1990's, the earliest specimens of our species thought to be from the Omo Valley, Ethiopia and dated to ca. 160-190,000 years ago (McDougal et al. 2005, White et al. 2003). Recently, re-dating of the fossil specimens from the Jebel Irhoud, Morocco, shows that our species now dates back to at least 300,000 years (Hublin et al. 2017). The next major milestone is the colonisation of Asia and Europe by our species. The earliest skeletal evidence of our species outside Africa were the crania from the caves of Skuhl and Qafzeh in Israel that are ca. 90-125,000 years old (Shea 2003) and indicated that our species first left Africa in the last interglacial period. A recent discovery of a jaw bone from Mislaya Cave, Israel, however, that is dated to 177-194,000 years ago (Hershkovitz et al. 2018) indicates that humans were already leaving Africa at an earlier date. By 50- 60,000 years ago, and perhaps a little earlier (Clarkson et al. 2017), humans in SE Asia had managed to sail navigable watercraft to Australia (O'Connell et al. 2018). Northern latitudes were colonised later, but by 40,000 years ago, humans were present in western Europe and North China. There is still uncertainty over when the Americas were colonised, but most researchers now suggest that this occurred ca. 15,000 years ago. By the end of the Pleistocene 11,700 years ago, we had become a global species.

The recommendation of the HEADS programme, therefore, is that the timespan of human evolution begins ca. 7-8 Ma-ago with the first hominins and ends with the first producing societies. Although this thesis concerns only the Pleistocene part of human evolution, it is appropriate that the Pliocene record of hominin evolution is recognised as part of our human heritage. This has already been done in South Africa through the Cradle of Humankind World Heritage site at Sterkfontein where many outstanding fossils of *Australopithecus* have been found, including the 3.3 Ma-old skeleton of "Little Foot" which has now been extracted after 20 years of patient work from cemented breccia. The East African fossil exposures in Chad, in the Afar Triangle, Awash and Omo valleys, Ethiopia, and the Koobi Fora region and Tugen Hills of Kenya would be serious candidates for a nomination as World Heritage Sites that record the early development of our lineage.

### III.i. Definition of a “site”

There is a fundamental conflict between Palaeolithic archaeologists and the WHC professionals concerning the definition of a “site”.

For the WH Convention, cultural heritage is close to the idea of architecture, a monument, building - in short, it concerns the built environment. This can clearly be seen in Article 1:

*for the purposes of this Convention, the following shall be considered as "cultural heritage";*

*- monuments: architectural works, works of monumental sculpture and painting, elements or structures of an archaeological nature, inscriptions, cave dwellings and combinations of features, which are of Outstanding Universal Value from the point of view of history, art or science;*

*- groups of buildings: groups of separate or connected buildings which, because of their architecture, their homogeneity or their place in the landscape, are of Outstanding Universal Value from the point of view of history, art or science;*

*- sites: works of man or the combined works of nature and of man, and areas including archaeological sites which are of Outstanding Universal Value from the historical, aesthetic, ethnological or anthropological points of view.*

This broad definition of a site was narrowed in practice by the application of the criteria over time (see III.iii and IV.i.v.).

For archaeologists, the definition of a “site”, its values and properties are clearly expressed by the Society for American Archaeology (SAA) (see: <https://www.saa.org/about-archaeology/what-is-archaeology>):

*Archaeology is the study of the ancient and recent human past through material remains. Archaeologists might study the million-year-old fossils of our earliest human ancestors in Africa. Or they might study 20th-century buildings in present-day New York City. Archaeology*

*analyzes the physical remains of the past in pursuit of a broad and comprehensive understanding of human culture.*

### *Archaeological Sites*

*An archaeological site is **any place** where there are **physical remains of past human** activities. There are many types of archaeological sites. Prehistoric archaeological sites are those without a written record. They may include villages or cities, stone quarries, rock art, ancient cemeteries, campsites, and megalithic stone monuments. A site can be as small as a pile of chipped stone tools left by a prehistoric hunter. Or a site can be as large and complex as the prehistoric settlements of Chaco Canyon in the American southwest. Historical archaeology sites are those where archaeologists can use writing to aid their research. Those could include densely populated modern cities, or areas far below the surface of a river, or the sea. The wide variety of historical archaeological sites includes shipwrecks, battlefields, slave quarters, cemeteries, mills, and factories.*

### *Artifacts, Features, and Ecofacts*

*Even the smallest archaeological site may contain a wealth of important information. Artifacts are objects made, modified, or used by humans. Archaeologists analyze artifacts to learn about the people who made and used them. **Non-portable artifacts called features** are also important **sources of information** at archaeological sites. Features include things like soil stains that show where storage pits, structures, or fences once existed. **Ecofacts** are natural remains related to human activity. Plant and animal remains can help archaeologists understand diet and subsistence patterns.*

### *Context*

*Context in archaeology refers to the relationship that artifacts have to each other and to their surroundings. Every artifact found on an archaeological site has a defined location. Archaeologists **record** the exact spot where they find an artifact before removing it from that location. In the 1920s, archaeologists found a stone spear point lodged between the ribs of a species of a North American bison that went extinct at the end of the last Ice Age. It settled an argument that had gone on for decades. The spear point established once and for all that people*

*had inhabited North America since the late Pleistocene. It is the context or association between the bison skeleton and the artifact that proved this. When people remove an artifact without recording its precise location, we lose that context forever. At that point, the artifact has little or no scientific value. Context is what allows archaeologists to understand the relationships between artifacts and between archaeological sites. It is how we understand how people in the past lived their daily lives.*

This conflict of definition also has major consequences for the concept of the moveable and immoveable heritage. Until October 1980 there is not one single trace about movable heritage within the Operational Guidelines of the Convention. Since then and across all the 18 updated versions the sentence (*Movable Heritage. Nominations of immovable heritage which are likely to become movable will not be considered*) is repeated with the same formulation, sometimes on p. 22 or p. 25. In February 2008 the sentence is included as p 48 until today.

Since 1999 it is interesting to note that when dealing with technical cooperation, the World Heritage Committee suggested prior financial support for immovable heritage, but not for movable heritage as part of the world heritage site.

However, the Operational Guidelines of the Convention in 1997 stated:

*p.100 on Technical co-operation: In order to make best use of the limited resources of the World Heritage Fund and because of the increasing number of cultural sites to be assisted, the Committee, while recognizing the importance of archaeological objects coming from sites inscribed on the World Heritage List, has decided not to accept requests which may be submitted for equipment for archaeological site museums whose function is the preservation of movables. Therefore, and in practice, the O.G. accept the intrinsic movable-immovable nature of a site.*

Moreover, Annex 3 of the Operational Guidelines 2017 when describing specific types of properties, (p 19) considers the inscription of Canals: *the authenticity and historical interpretation of a canal encompass the connection between the real property (subject of the Convention), possible movable property (boats, temporary navigation items) and the associated structures (bridges, etc.) and landscape.* It seems a very narrow-minded approach



to make this distinction explicit only for canals as a type of heritage property and not for the full range of heritage typologies.

If we re-read the Annex 3 of the O.G. today, concerning the definition of Cultural Landscape, we realize that *cultural properties* are considered *that represent the "combined works of nature and of man" designated in Article 1 of the Convention. They are illustrative of the evolution of human society (non-human beings) and settlement (not presence) over time, under the influence of the physical constraints and/or opportunities presented by their natural environment and of successive social, economic and cultural forces, both external and internal.*

*The term "cultural landscape" embraces a diversity of manifestations of the interaction between humankind and its natural environment* (the definition of Cultural Landscapes pick up this criteria from the former natural criteria). This conception has been practically oriented to techniques of sustainable land-use, and the existence of traditional forms of land-use that support biological diversity. It is a category that has been used for historic properties.

Although “mobile” or “moveable“ heritage is not recognised as worthy of consideration by the WHC, it is fundamentally important for archaeologists in that the moveable heritage is an inherent part of a site that is removed for further examination in a research laboratory or displayed in a museum. Examples of the most visually understandable and easily recognised would be the Venus figurines from European Upper Palaeolithic sites, the flutes from Vogelherd, the 350,000-year-old spears from Schöningen, Germany, or some of the most examples of Upper Palaeolithic burials from sites such as Sungir, Russian Federation, or Dolni Vestonice, Czech Republic.

In palaeoanthropology, two main types of “site” are recognised – open-air sites and caves.

#### Open-air sites

Most of the skeletal evidence for the early part of our evolution in Africa (covering *Australopithecus* and early forms of *Homo*) comes from fluvial or lacustrine landscapes in which fossils were preserved under conditions of gentle but rapid deposition: gentle enough to ensure that fragile bones were not excessively fragmented, and rapid enough that the fossils were not destroyed by exposures to the elements, trampled or scavenged by other animals. World-famous examples are the numerous fossils from the Afar Triangle and Omo Valley,

Ethiopia, Koobi Fora, Kenya, and Olduvai Gorge, Tanzania, but there are many others that need not be named here. We can additionally note one of the most famous discoveries from a former lakeshore at Laetoli, Tanzania, where ca. 3 million years old hominin foot-prints are preserved: these resulted from at least two hominins walking across a damp lakeshore shortly before it was buried by volcanic ash from a nearby eruption (Leakey and Hay 1979).

These are not “sites” in the sense envisaged under the terms of the WHC; they are simply places in an ancient landscape where fossils were found. As such, these “sites” do not have clearly defined boundaries (unlike e.g. the Parthenon or Stonehenge), and their value lies in what was removed to a research laboratory, and what geologists learnt about their age, environmental and climatic context by studying the layers in which the fossils were discovered, as well as those in the vicinity that lie over and under them. An additional point that is discussed below is that these are generally found in eroding landscapes. This means that in almost all cases (especially in Ethiopia and Kenya), there is no possibility of conserving the place where fossils were found. As discussed below, this raises serious issues concerning the WHC requirements of conservation and management of a site.

An additional potential problem is that there can be geologically significant deposits that do not contain archaeological evidence but which are nevertheless highly important in Palaeolithic research. One example is the volcanic ash from the mega-eruption of Mount Toba in Sumatra, Indonesia, ca. 74 ka-ago. This ash is preserved over large parts of India and is a major marker horizon for establishing the age of stone artefacts above and below it. Another example are geological sections that can be dated palaeomagnetically, as these are also used as marker horizons for correlating sites in the surrounding area, as in the Nihewan Basin, China (Zhu et al. 2001, 2004).

### Caves

One major advantage of caves over open-air sites with regard to the WHC is that caves have finite boundaries that can be clearly delineated and protected.

The most tangible and explicit evidence from Pleistocene sites are fossil skeletal remains as traces of our evolution when our ancestors diverged from the ancestors of gorillas, chimpanzees and bonobos ca. 6-8 million years ago.

It is for those two reasons that the first, and for a long time, the only human evolution sites given world heritage status were caves that had produced fossils of our ancestors. These were Zhoukoudian, China, inscribed in 1987, where the remains of *Sinanthropus pekinensis*, now known as *Homo erectus* were found; Sterkfontein, South Africa, inscribed in 1999 with an extension in 2005 to include Taung and other sites. Other sites responded to a non-deliberate scientific survey like the site complex of Atapuerca, Spain, inscribed in 2000, or the case of Sangiran, Indonesia, inscribed in 1996, an open-air location having iconic status as one of the most important sites for *Homo erectus*. Recently, the caves in Gibraltar, Mount Carmel, Israel, and the Swabian Caves, Germany, have all been ascribed World Heritage status.

### **III.ii. The problem of updating**

Palaeoanthropology is an extremely fast-moving field in which new discoveries are continually made and estimates of when events happened are constantly under revision by additional geochronological work or re-examination of the primary data. This can mean that recommendations made at a meeting concerning the importance of a discovery can easily be out-of-date by the time the recommendation is implemented: science moves faster than the nomination process. As three out of many examples that could be chosen, as indicated above, the earliest evidence for *Homo sapiens* outside Africa is now 177-194 ka, not 125 ka (Hershkovitz et al. 2018); the earliest evidence for hominins outside Africa is 2.1 Ma, not 1.85 Ma (Zhaoyu Zhu et al. 2018); the extinction of *H. floresiensis* occurred at ca. 50 ka, not 12 ka (Sutnika et al. 2018).

### **III.iii. Short-comings of the WHC Convention's Operational Guidelines in relation to human evolution sites**

The relevant criteria for nominating a site for World Heritage status are contained in the subsection of paragraph 77. In addition, there are importance paragraphs concerning the integrity (paragraphs 79-86) and authenticity (paragraphs 87-95), and its protection and management (paragraphs 96-118) which will be discussed below.

The criteria set out in paragraph 77 of the WHC are as follows: (Italics are used when referring to the official text of the World Heritage Operational Guidelines of the WH Convention, 2017).

77. The Committee considers a property as having outstanding universal value (see paragraphs 49- 53) if the property meets one or more of the following criteria. Criteria have changed over time.

- Nominated properties shall therefore:
- (i) represent a masterpiece of human creative genius;*
  - (ii) exhibit an important interchange of human values, over a span of time or within a cultural area of the world, on developments in architecture or technology, monumental arts, town-planning or landscape design;*
  - (iii) bear a unique or at least exceptional testimony to a cultural tradition or to a civilization which is living or which has disappeared;*
  - (iv) be an outstanding example of a type of building, architectural or technological ensemble or landscape which illustrates (a) significant stage(s) in human history;*
  - (v) be an outstanding example of a traditional human settlement, land-use, or sea-use which is representative of a culture (or cultures), or human interaction with the environment especially when it has become vulnerable under the impact of irreversible change;*
  - (vi) be directly or tangibly associated with events or living traditions, with ideas, or with beliefs, with artistic and literary works of outstanding universal significance. (The Committee considers that this criterion should preferably be used in conjunction with other criteria);*
  - (vii) contain superlative natural phenomena or areas of exceptional natural beauty and aesthetic importance;*
  - (viii) “outstanding examples representing major stages of earth's history, including the record of life, significant on-going geological processes in the development of landforms, or significant geomorphic or physiographic features”.*
  - (ix) be outstanding examples representing significant on-going ecological and biological processes in the evolution and development of terrestrial, fresh water, coastal and marine ecosystems and communities of plants and animals;*
  - (x) contain the most important and significant natural habitats for in-situ conservation of biological diversity, including those containing threatened species of outstanding universal value from the point of view of science or conservation.*

At all meetings, difficulties were found in adapting some of these criteria to reflect the OUV of a Pleistocene site. To take each in turn:

*(i) represent a masterpiece of human creative genius*

As discussed at HEADS meetings, *a surprising amount of our pre-industrial technology has its roots in the Palaeolithic, particularly from 40,000 years ago on. The main technological development after the Palaeolithic was to substitute metal for stone. This apart, most of the technology used in the Bronze Age would have been familiar to many late Palaeolithic hunters and gatherers* (Dennell 2015a, 10).

In most other cases, “human creative genius” is less evident to non-specialists without explanatory text. As example, the stone flakes from Gona, Ethiopia, look unremarkable to most people yet mark the beginning of the next 2.6 million years of technical development by the production of flaked stone that could be used for cutting, slicing, whittling and scraping. The palaeolithic saw several major developments in technologies for hunting, for processing food and other items, for clothing and storage and for artistic purposes. Some are more visually obvious than others: for example, stone projectile points, spear throwers and fish hooks need less explanation than traces of birch resin on a stone tool that indicates the earliest use of glue, or bones of small animals such as arctic hare that imply the use of nets and snares. In some cases, we know that there must have been an example of “human creative genius” even if there is no direct evidence for it. A prime example is the evidence for sea-worthy boats that could be steered or sailed. We know that Australia could not have been colonised without such water craft and that it was certainly reached ca. 55-60,000 years ago, but no evidence of the boats used for those voyages has survived.

Personal ornaments in the form of pendants and beads provide another example of human creativity, both in their own right and as a way of showing status and identity (Wolf 2015).

As discussed at HEADS meeting on Eurasia in Tübingen University, the inclusive character of the term ‘human’ includes us as *H. sapiens* as well as all predecessors within the genus *Homo* (such as Neanderthals, *H. erectus* and *H. habilis*) and earlier forms such as Australopithecines that are ‘human’ in that they are anatomically more like the genus *Homo* than any extant ape (Dennell 2015a, 9). We should also include the hobbit, *Homo floresiensis*, from Indonesia, *H. luzonensis* from the Philippines as well as the Denisovans, from Russian Federation.

*The most obvious Palaeolithic example of ‘human creative genius’ is the art in caves and on portable items such as figurines and engravings, of which the most famous examples are from*

*Eastern and Western Europe and Siberia* (Dennell 2015a, 9). Blombos, South Africa, and Apollo Cave, Namibia, are sites not yet properly investigated.

The best known are the caves of northern Spain such as Altamira and the Vézère Valley of Southwest France, such as Chauvet and Lascaux, France, which date back to 40,000 years ago and are deservedly world heritage sites. Recently, one of the most unexpected discoveries has been that cave art on Borneo, and Sulawesi, Indonesia, is as ancient as that in Western Europe (Aubert et al. 2014, 2018). Another surprising discovery is that cave art may not be unique to our species, as some has recently been dated to ca. 55-60,000 years old and attributed to Neanderthals (Hoffman et al. 2018), although this claim has been challenged on technical grounds. We can also include the 30-40,000 year-old mobiliary art of the Upper Palaeolithic, such as the Venus figurine and the “Lion Man” from Swabian Caves, Germany, as well as the flutes from Vogelherd. However, under criterion (i), these were not considered as appropriate evidence, and that point clearly demonstrates the crucial misunderstanding of the concept of a “mobile” heritage for a Pleistocene site as regards the WHC.

As HEADS meeting in Tübingen pointed out: *Because much of our pre-industrial technology originated in the Palaeolithic, this criterion can and should be used much more widely in relation to many items of material culture. The Palaeolithic provides several instances of ‘human creative genius’ in the form of innovations that provided an adaptive advantage for their users and thus facilitated their survival in an often hostile world, contributing to the emergence of our own species as the dominant ape on the planet. First and foremost, there are the earliest 3.3 Ma stone tools from Kenya (Harmand 2015). Here, the significance lies in the repeated production of sharp conchoidal stone flakes that could be used for cutting (meat from a carcass, for example) or whittling wood (for use as a digging stick, for instance). Secondly, the Acheulean handaxe, which was the first purposefully shaped stone artefact and the most successful artefact ever made in terms of the longevity of its design, which combined sharp cutting edges with mass. As ‘the Swiss army knife of the Palaeolithic’, this multi-functional tool was first produced in east Africa c. 1.7 Ma (Lepre et al. 2011) and was used in Africa, Europe, west and south Asia until c. 200-300 ka. Examples such as the razor-sharp hand axes used at Boxgrove, U.K., 500 ka were equal to steel knives as butchery items for cutting and slicing meat when defleshing carcasses (Dennell 2015a, 9).*

The scientists invited to the international HEADS meetings always showed certain skepticism related to the absence of Criterion (i) to justify the creative human genius in the case of the

Pleistocene sites. Throughout several discussions, the members of the HEADS Scientific Committee cited reasons and pointed out specific places where innovations, techniques and achievements of importance for the human evolution process took place. I follow in this argumentation Professor R. Dennell, who compiled over the years the comments, advances of the research and arguments from HEADS discussions and agreements and collected topics and locations that reflect the interdisciplinary agreements reached by the HEADS community (Dennell 2015a, 9-14):

- meat procurement:

- spears: the earliest hunting weapons discovered in Schöningen, Germany; some other wooden evidences in Boxgrove, U.K.;
- the bow, arrow and boomerang, documented since the late Pleistocene;
- traps and snares and *hare at late glacial places in Iced Eastern Europe and Siberia*; or *Japanese pit traps that may have been used for big mammal's hunting in more recent period of the Late Pleistocene.*

-fishing practices: harpoons and fishhooks

- processing of resources:

- fire: to modify surroundings by creating light and heat; to modify food, cooking practices to improve nutrition; smoked practices preserves fish; fire enlarges the dietary spectrum (Wrangham and Carmody 2010); fire was used to repel insects; with fire hominins can mark a position. Evidences were found in Chesowanja, Kenya and Swartkrans, South Africa, *Gesher Benot Ya'aqob, c. 700-780 Ka in Israel and Zhoukoudian, China, c. 500-700 Ka.* (Weiner et al. 1998). In Europe, fire was regularly used in the Upper Palaeolithic. In Africa, Middle Stone Age (MSA) levels were dated to c. 77 Ka at Sibudu Cave, South Africa (Goldberg et al. 2009).
- *technologies for preserving meat by salting or drying, as in Qesem Cave.*
- technologies related to the processing of plants fibres for clothing, as *at the Upper Palaeolithic site of Dolni Vestonice, Czech Republic.*

- advanced microlith technologies, *first evidenced in southern Africa c. 60 Ka and in India and Sri Lanka c. 30-36 Ka.*; sawing tools (*reeds, fibres or skins*) for basketry, making *containers or clothing*. Scratching stones to proceed plant *such as nuts, cereals and tropical starch plants* to make them eatable and nourishing.
  - well-preserved evidences of skins and fiber material and cordage for sewing or binding, were found in Tianyuan Cave, China, (Trinkhaus and Shang 2008); as well as in the case of Sungir grave, near Moscow, Russian Federation.
  - wood working evidences in Australian, and *nut-cracking evidenced at Gesher Benot Ya'aqob, Israel c. 800 Ka* (Goren-Inbar et al. 2002).
  - weaving evidence at the c. 26 Ka burials at Dolni Vestonice, Czech Republic, where fragments of milkweed (*Asclepias sp.*) and (*Urtica sp.*) were discovered.
- one of the most outstanding examples of the human creative genius in Palaeolithic is music, represented by *the remarkable bone and ivory flutes found in the Swabian Caves, Germany* (Conard et al. 2009).

As HEADS community stated, those innovations have *been an integral part of human life for over 30,000 years* and are key in the process of becoming humans.

*(ii) exhibit an important interchange of human values, over a span of time or within a cultural area of the world, on developments in architecture or technology, monumental arts, town-planning or landscape design;*

As discussed formerly, this criterion explicitly shows the bias towards the built heritage and is largely unsuitable for pre-agricultural and Palaeolithic societies that did not invest in substantial built structures. A few exceptions can be noted, such as the structures made from mammoth bones at Mezhirich, Ukraine, or the circular structure made from bones in the cave of Bruniquel, France (Soffer et al. 1997; Jaubert et al. 2016;), but these are very rare in the Palaeolithic world.



*(iii) bear a unique or at least exceptional testimony to a cultural tradition or to a civilization which is living or which has disappeared*

This criterion has been used in several World Heritage nominations and is perhaps the easiest to demonstrate. The longevity of Palaeolithic art in western Europe for example is one very obvious testimony of a cultural tradition that lasted for millennia but which has now disappeared. Examples are the Omo and Awash Valleys, Ethiopia, fossil hominin sites in South Africa and Mt. Carmel, Israel, among others.

This criterion *can be singled out in the Americas in the High Andes, where humans were adapting to high-altitude living by 10,000 years ago (Dillehay 2000, p.172-185). Tibetan Plateau above 4,000 metres, or the High Andes represented the earliest example of human adaptation to habitual life at high altitudes (Dennell 2015b, 26). Recent discoveries claim that people were living at 4600 m above sea level on the Tibetan Plateau 36,000 years ago (Zhang and Dennell 2018).*

*(iv) be an outstanding example of a type of building, architectural or technological ensemble or landscape which illustrates (a) significant stage(s) in human history*

This again relates to the built environment.

*(v) be an outstanding example of a traditional human settlement, land-use, or sea-use which is representative of a culture (or cultures), or human interaction with the environment especially when it has become vulnerable under the impact of irreversible change*

This criterion should be treated in two ways; first, a) regarding traditional human settlement, land-use, or sea-use:

Sea-use:

Wallacea, Ryuku Islands, Japan, Australia

a.i. Cyprus: recent investigations have shown a remarkable and wholly unexpected process of colonisation beginning in the twelfth millennium bp. and involving the relocation from the mainland of wild boar, followed by early domestic goats, cats and cattle and subsequently by the early tenth millennium bp of wild fallow deer, foxes and domestic sheep (Vigne et al. 2014).

### a.ii Wallacea and Australia

There is a long and rich tradition of sea-faring in SE Asia that resulted in the colonisation of Australia, which could only have been colonised by intentional and return voyaging (O’Connell et al. 2018). Examples from Wallacea are the evidence for humans on East Timor at 46 ka (Hawkins et al. 2017), and deep-sea fishing on Timor at 42 ka (O’Connor et al. 2011).

### a.iii) East Asia: Japan and the Ryuku Islands

PalaeoHonshu – the conjoined islands of Kyushu, Honshu and Shikoku – was colonised by sea, most likely across the Tsushima Strait from Korea at 38 ka (Izuho and Kaifu 2015). Okinawa in the Ryuku Islands was reached shortly after ca. 32 ka, probably from Taiwan by using the Kurishio Current and after several long passages across open sea and out of sight of land (Kaifu et al. 2015).

b) ‘human interaction with the environment especially when it has become vulnerable under the impact of irreversible change’

This part of criterion v) requires first a well-detailed archaeological record of settlement, and second, an equally detailed and well-dated record of environmental change. The concept of ‘irreversible change’ requires a time-scale. For example, at a generational scale of *c.* 50 years, an environmental or climatic change may seem irreversible, but conditions might revert to their former state after a few centuries. Nevertheless, this part of criterion v) could be used in areas where there are detailed settlement and environmental records: caves in SW France, the southern Levant, Niah Cave, Borneo, and Sibudu, South Africa, might be relevant candidates.

*(vi) be directly or tangibly associated with events or living traditions, with ideas, or with beliefs, with artistic and literary works of outstanding universal significance. (The Committee considers that this criterion should preferably be used in conjunction with other criteria)*

The history of palaeoanthropology can be listed as an example of a living tradition, particularly because in regions such as East Asia, investigations into our remote past began over a century ago (see e.g. de Vos 2014).

*(vii) contain superlative natural phenomena or areas of exceptional natural beauty and aesthetic importance*

At the *HEADS* meetings where *this criterion* was discussed, those present objected to *this criterion* because of it being *relativistic and subjective*. There is no universal agreement over what is 'beautiful', and beauty is inevitably very much in the eye of the beholder. Despite the subjective nature of *this criterion*, paleo-anthropologists and Palaeolithic archaeologists could utilize the first part of *this criterion* by considering 'superlative natural phenomena'. This aspect of *criterion vii*) overlaps with *criterion viii*) (Dennell 2015a, 16). The Rift Valley provides one obvious scenic example.

*(viii) "outstanding examples representing major stages of earth's history, including the record of life, significant on-going geological processes in the development of landforms, or significant geomorphic or physiographic features"*.

Since 1994, the O.B. do not include interactions between man and nature and this criterion does not include any kind of cultural reference. Therefore, the IUCN does not take part in any human evolution discussion or evaluation.

Human evolution occurred during the Pleistocene which was one of the most formative and dynamic geological periods in earth's history. The present land forms of much of Europe and North America were shaped by the ice ages, and loess deposition across continental Eurasia had a profound effect on landscapes of Europe. Human evolution cannot be properly studied except by reference to 'major stages of earth's history, including the record of life'.

*(ix) be outstanding examples representing significant on-going ecological and biological processes in the evolution and development of terrestrial, fresh water, coastal and marine ecosystems and communities of plants and animals.*

The same comment on *criterion (viii)* applies here.

*(x) contain the most important and significant natural habitats for in-situ conservation of biological diversity, including those containing threatened species of outstanding universal value from the point of view of science or conservation.*

As well reflected by the HEADS Tubingen discussions, *this is an ancillary criterion in the sense that it is fortuitous if a monument (whether historical or Palaeolithic) happens to lie in an area where habitats or species may be endangered. These habitats or species might not even have been in the area where a monument was constructed or a Palaeolithic site was occupied. Nevertheless, if a site or monument is given World Heritage status, it greatly strengthens local protection measures in the surrounding buffer zone. An additional problem with this criterion is that a threatened species has to have 'Outstanding Universal Value from the point of view of science or conservation'. This is inherently subjective. Whilst most scientists and conservationists would agree that mammals such as the Siberian tiger, the Javanese white rhino, the orang-utan and the panda, have 'outstanding universal value', opinion would probably be divided if the threatened species (Dennell 2015, 21) was a rare type of insect, yet the insect may have its own universal value: the bee is an obvious example, given its crucial role in pollinating fruit trees and providing honey.*

As recalled in HEADS Eurasia series, *in some cases, there is a fortunate juxtaposition of a site and a threatened habitat or species. Two of the most obvious are on island in South-East Asia. Niah Cave, Borneo, lies in a protected remnant of rainforest, most of which has been cleared locally for the production of palm oil. The rainforest thus acts as a haven for a wide variety of wildlife, including bats and *Aerodramus*, a swiftlet, which makes the nests that are harvested for birds-nest soup. The island of Flores and the only place where the 'hobbit', *H. floresiensis*, has been recorded, and its offshore islands such as Komodo, Indonesia, are the home of the Komodo dragon, *Varanus komodoensis*. Varanids were once common in Australia and Indonesia but are now a relict population regarded as endangered by the IUCN (Dennell 2015a, 21). Caves in other regions often contain both Palaeolithic deposits and endangered populations of bats, and this provides another example where Palaeolithic research and conservation can proceed together.*

Additionally, Palaeoanthropology – the study of human evolution – is an integral part of primatology, and the links between them have been explored ever since Charles Darwin, Alfred Wallace and Thomas Huxley articulated the idea of evolution in the 1850's. A basic

feature of physical anthropology is the comparison of the anatomical similarities and differences that we share with our nearest relatives, the chimp, gorilla and bonobo, in terms of locomotion, dentition, manual dexterity, and their behaviour in terms of hunting, feeding, foraging, diet, tool-use, sociality, parenting, etc., and these themes have also been applied to the wider primate family of monkeys and prosimians. As one of the major adaptations of our species was living in the rainforests of the tropics, palaeo-anthropologists have also drawn upon the rich literature of those who study the primate inhabitants of rainforests (Sanz and Dennell 2018). Gombe, the Sanctuary of Chimpanzees in Tanzania, has just been included in the Tentative List of World Heritage, as well as the Pondaung anthropoid primates palaeontological sites in Myanmar. Both of them represent a hope for a better life and archaeological primates' environment representation on the WH List.

Authenticity (paragraphs 79-86) and integrity (paragraphs 87-95)

These issues are covered by several paragraphs that do not need to be discussed here. The key component of authenticity is that the site or discovery has to be credible to the scientific community; the evidence should be published in peer-reviewed journals, and subject to the normal type of cross-examination that applies in science. In instances where oral testimony is provided by local people (as in for example South Africa or Australia), this information needs to be credible and cross-checked by documentary records where possible.

Integrity

According to the WHC, integrity *is a measure of the wholeness and intactness of the natural and/or cultural heritage and its attributes* (paragraph 88). The concept of integrity has a slightly different meaning for Palaeolithic archaeologists. For a site to have “integrity”, there has to be a satisfactory understanding of the site formation processes and taphonomic history of the site, and a clear exclusion of contamination. Ideally, a Palaeolithic site with a high degree of integrity is one where the finds relate to a short period of time, as opposed to a time-averaged set of events that could span several thousands of years.

Protection and management (paragraphs 96-118)

The WHC has gone to great length in trying to ensure that World Heritage sites are protected and properly managed. The key paragraph (no. 96) says that *Protection and management of World Heritage properties should ensure that the outstanding universal value, the conditions of integrity and/or authenticity at the time of inscription are maintained or enhanced in the future.*

Management capacity is the Achilles heel of the implementation of the Convention as referred in the frame Factors Affecting the Pleistocene and Hunter-Gatherer sites (*Fig. 2*). The frame shows the result of analysing more than 500 state of conservation reports, and a final systematization of the questionnaires of the Periodic Reporting Exercise of World Heritage (SOCs Reports, source <https://whc.unesco.org/en/118/>).

*Legislative, regulatory and contractual measures for protection*

**98.** *Legislative and regulatory measures at national and local levels should assure the survival of the property and its protection against development and change that might negatively impact the outstanding universal value, or the integrity and/or authenticity of the property. State Parties should also assure the full and effective implementation of such measures.*

*Boundaries for effective protection*

**99.** *The delineation of boundaries is an essential requirement in the establishment of effective protection of nominated properties. Boundaries should be drawn to ensure the full expression of the outstanding universal value and the integrity and/or authenticity of the property.*

The positive aspect of these paragraphs is that there is an agreed legal framework within which sites can be conserved. Regarding human evolution and Palaeolithic sites, this can provide a useful means of contesting plans for development, mining, agro-business and other threats that might damage the integrity of the site. Another positive aspect of these paragraphs is the concept of the buffer zone as a way of protecting the surroundings of the site.

In relation to the buffer zones, we should take into consideration that the visibility of the archaeological record is determined by geomorphic, pedogenic, and other post-depositional formation processes; or by the nature of the archaeological record; or determined by techniques and strategies of the survey methodologies; or environmental conditions and climate change; or determined by anthropic factors. These factors are important to ensure definition of an

## Factors Affecting the state of Conservation of the Pleistocene and Hunter-Gatherer sites inscribed on the World Heritage List of UNESCO, according to Periodic Reporting regional exercises, until May 2019

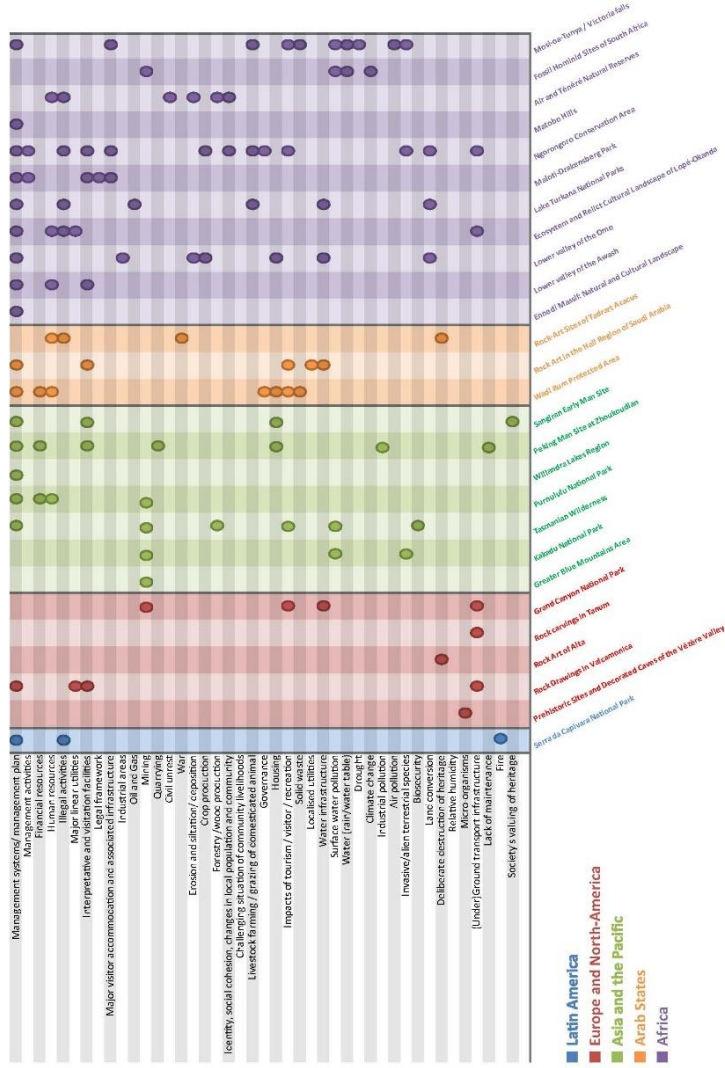


Fig. 2: Factors Affecting the state of Conservation of the Pleistocene and Hunter-Gatherer sites inscribed on the World Heritage List of UNESCO (elaborated by Nuria Sanz, source: <https://whc.unesco.org/en/list/>).

appropriate buffer zone in terms of future research and conservation purposes. Geomorphological and pedological mapping, very precise description of soil matrix, microtopography and all significant environmental variables need to be documented by field work as a proper base for heritage protection purposes (Gruskovnjak 2008; see also Burger et al. 2008). A WH nomination file should fix precise, reliable and accurate standards, incorporating the full array of constituents of the Pleistocene record.

Management issues can be problematic. As example, at the HEADS meeting in 2010 in Addis Ababa, several delegates expressed concern over the staffing requirements for protecting a site as being beyond their means. Compromise solutions may be required for some sites in developing countries, for example in involving local communities.

According to the WH Convention implementation, cave sites are the easiest type of palaeolithic and palaeoanthropological sites to protect and manage because they are enclosed and easily delineated from the spatial point of view. *Examples are the caves in Sierra de Atapuerca, Spain, those at and around Zhoukoudian, China, and those in the Sterkfontein Valley, South Africa. Other well-known ones of major significance are the Mount Carmel caves (Skuhl, Tabun), Israel; the Haua Fteah, Libya; Niah Cave, Borneo; and those in South-western France, Southern Germany, and along the coast of South Africa (Dennell 2012, 72) such as Klasies River Mouth and Pinnacle Point. However, cave sites behave as a dynamic sediment container and taphonomy and geologic/geomorphologic processes could be considered more complex than those operating in open air areas, as in the case of Ubeidiya, Israel; Olduvai Gorge, Tanzania; Olorgesailie, Kenya and Melka Kunture, Ethiopia. .*

The notion of the site is complex in the case of open-air areas since are often found in secondary context and with high rates of erosion. Palaeo-environments require very careful observations, multidiscipline reading of evidences and a critical understanding of how the fossil site was formed. As discussed at HEADS meeting in Addis, *the main erosive agent is usually rain. In semi-arid and arid environments, this can be very heavy, even if the annual total is low. Trampling by animals (especially herd animals) can also be a significant cause of erosion and damage to fossils. In these types of environment, sites have very short lifespans – once eroded, they and their contents are likely to be destroyed within a few years. Sites with fossilized hominin footprints – as examples, Laetoli, Tanzania, and Ileret, Kenya – are especially*



*ephemeral, and almost impossible to protect for public viewing without enormous investment* (Dennell 2012, 72).

Although it is clearly beneficial if the public has a greater interest in World Heritage, there are potential dangers in the damage that can be caused by visitation.

As an indication of that threat, World Heritage Day (April 18<sup>th</sup>) is deliberately scheduled to tie in with the UN's International Year of Sustainable Tourism for Development. Few monuments can survive unscathed if visited by over a million people every year. There clearly have to be sensitive yet firm measures to ensure that visitor access does not damage the physical fabric of the site. In some instances, even the site itself cannot be visited without endangering the property. Lascaux and Chauvet are two examples: the cave art at these sites will deteriorate and eventually disappear because of the impact from uncontrolled ventilation, air conditions, water vapour and bacteria exhaled by visitors. At great expense and with enormous skill, these caves now have replicas that show every detail, and allow a visitor experience that would otherwise be impossible. Replicas, as the case of Altamira Cave, Spain, should allow proper preservation of the original, and not be used as an additional facility of the site.

#### IV) Discussion, achievements and recommendations

##### Discussion

In the preceding pages, I have shown that human evolution is seriously under-represented in the current list of World Heritage sites, and that this list is also heavily biased towards Europe. Overwhelmingly, the list of World Heritage sites addresses the built heritage of the last five or six millennia. Of the 1,211 sites so far conferred with World Heritage status, fewer than 10 are specifically about human evolution over the last 7-8 million years. Therefore, over 99% of our evolution and emergence as a global species is un-represented by the current perception of World Heritage.

#### **IV.i. The main limitations of the World Heritage approach to selecting World Heritage Sites are:**

##### IV.i.i. Updating the definition of a “site”

The Burra Charter of 2013 defines the fabric of a site (section 1.3) as *all the physical material of the place including components fixtures, contents and objects*. Nevertheless, as shown above, a “site” has consistently been defined by the WHC in terms of its architecture, monuments and built structures. For archaeologists, (as shown above by the definitions of the Society for American Archaeology) a “site” is simply a place where something was found. It may be a cave where people lived, or simply a scatter of animal bones and flaked stone that is found eroding from a river bank. For those who study the skeletal evidence of our evolution, a “site” might simply be the place where a jaw or part of a skull was found in a gravel or limestone quarry.

##### IV.i.ii. The inappropriate distinction between moveable versus immovable heritage for Pleistocene and Hunter-Gatherer sites

As seen above, the flutes and ivory figurines from the caves of the Swabian Caves, Germany, were disregarded as evidence for nominating these sites for World Heritage status on the grounds that the World Heritage Centre does not consider moveable items as grounds for inscription. Put mildly, this is an absurd situation for Palaeolithic archaeologists. These items are some of the most outstanding and iconic representations from our remote past, and the “Lion Man” can rightly be regarded as a major work of art in terms of its originality. The flutes are the earliest definite evidence that we have of music. With few exceptions in archaeology, it is the contents of sites that determine their importance, and it is the objects that are removed from the site during excavation and taken to a research facility or museum that justify its excavation.

With regard to the application of the criteria (i) the ICOMOS EVALUATION of the Jura Swabian Caves in 2017 stated:

*Criteria under which inscription is proposed: The property is nominated on the basis of cultural criteria (i) and (iii). Criterion (i): represent a masterpiece of human creative genius; This criterion is justified by the State Party on the grounds that the caves and their surroundings were the habitat of early modern Homo sapiens, and represent the places where early art and musical instruments were made and used. The figurative art objects and musical*

*instruments are among the oldest found anywhere in the world. ICOMOS considers that a distinction exists between the objects of art and the places where they were found. While the portable art objects and musical instruments can be said to be masterpieces, the same cannot be said of the caves where they were found. The nominated property provides an exceptional testimony to the origins of art and music among humans, but that does not mean that the caves themselves are masterpieces. In this sense, Caves and Ice Age Art in the Swabian Jura are different from other inscribed properties that have paintings or engravings on their walls, where the art is an integral part of the place. As well, arguments related to the origins of religious or spiritual behavior are not well developed and this aspect is not considered to be part of the Outstanding Universal Value of the property. ICOMOS considers that this criterion has not been justified (<https://whc.unesco.org/en/list/1527/documents/>).*

This statement seems extraordinarily artificial when it refers to the very nature of the archaeological sites. A cave when decorated is a culturally patterned structure and figurines are evident glorious manifestations of our first human capacity to recreate culture in nature. It seems that ICOMOS did not take into consideration the ICOMOS Salalah Heritage Concept related to the inextricable unity between nature and the man-made heritage as referred in the Charter Indonesia 2003, as well as the ICOMOS New Zealand Chart which describes cultural heritage value as the understanding and appreciation of all the aspects of natural heritage value and all available forms of knowledge (*Annex II*).

#### IV.i.iii. The false distinction between cultural and natural Pleistocene Heritage

As seen, only 39 sites have been ascribed World Heritage status as mixed properties of culture and nature. Indeed, the two have been firmly kept apart with the result that World Heritage is primarily about culture and the IUCN is about nature. This distinction is untenable because humans and their ancestors are rightly seen as part of nature – as a cultural animal that is shaped and largely defined by its natural surroundings.

The falsity of this dichotomy is clearly shown by the Ngorongoro Conservation Area, Tanzania. This is rightly regarded as one of the most spectacular landscapes in the world, and for many, it summarises perfectly Africa's unique biodiversity. Its fauna has also been studied in immense detail, particularly its large predators: the lion, hyaena, leopard, cheetah and wild dog as well as its large herbivores such as the elephant. The Ngorongoro Conservation Area also includes Olduvai Gorge which is one of the most significant human evolution sites in the world. Here in 1959-1960 the *Zinjanthropus boisei* and *Homo habilis* were discovered in 1.8 million

years old layers that contained stone tools and animal bones that brought East Africa to the forefront of human origins research. Olduvai and localities like it are seen as “cultural” sites because they contain evidence of early humanity, yet our understanding of their behaviour comes from studies 30 years later of how the bones of animals that die in the Conservation Area become weathered, fragmented and buried; from studies of seasonal fluctuations in the abundance of water and plant resources; and from analyses of the seeds and pollen of the plants that grow today in the area and which grew there in the past. Here, and in almost all instances of the Palaeolithic, the behaviour of our ancestors can only be properly understood in relation to their environmental context. From the viewpoint of a palaeo-anthropologist, it makes no sense to place Olduvai Gorge in a cultural category and the surrounding Conservation Area in a natural one. The site was inscribed in 1979 on the World Heritage List as a natural site. Only in 2010 the site was inscribed under criterion (iv) as a cultural site *that yields an exceptionally long sequence of crucial evidence related to human evolution and human-environment dynamics, collectively extending from four million years ago to the beginning of our era, including physical evidence of the most important benchmarks in human evolutionary development* (Criteria (iv), <https://whc.unesco.org/en/list/39>). The OUV of the site states *that although the interpretation of many of the assemblages of Olduvai Gorge is still debatable, their extent and density are remarkable. Several of the type fossils in the hominin lineage come from this site. Furthermore, future research in the property is likely to reveal much more evidence concerning the rise of anatomically modern humans, modern behavior and human ecology.* The WH Committee recognizes the importance of future research but is concerned about the state of conservation of the site. Ngorongoro has been the site that has been evaluated by the WH Committee more often. Cultural heritage and natural heritage will be both in danger if infrastructures, as planned, will be developed at the site for touristic purposes. Endemic species and past and future scientific developments will be at risk if strong corrective measures are not in place.

#### IV.i.iv. The benefits of erosion as well as its dangers

From the viewpoint of the WHC, all forms of erosion are adverse, and policies need to be implemented that can lessen or prevent it. The situation is very different in studies of the Palaeolithic and human evolution. In East Africa, almost all the skeletal and archaeological evidence for early human evolution and behaviour comes from the flaked stones, animal bones and hominin skeletal remains that are exposed by erosion. As seen above, the main cause is rain and disturbance by large animals. Because sediments are soft, rates of erosion can be high.

In some situations, rates of erosion can be reduced (by, for example, terracing or restricting grazing) but in terms of accumulating new data, erosion plays a vital role.

#### IV.i.v. The WHC criteria for evaluating sites and properties

I have explained how and why the concept of a World Heritage emerged and why it focused on the monuments and architecture of the last few millennia. I have also shown how and why most of the criteria that are used to assess a site are inappropriate for Palaeolithic sites and sites related to human evolution. The principal failings are, as seen above:

Criterion (i) examples of “*human creative genius*” cannot be used because in Palaeolithic archaeology, the evidence for this (apart from cave art) lies in the objects that are found in excavation and thus counts as “movable heritage which is explicitly excluded by the WHC, para 48 of OG 2017.

Criterion (ii) “*exhibit an important interchange of human values, over a span of time or within a cultural area of the world, on developments in **architecture** or technology, **monumental arts, town-planning or landscape design*** (bold by the author).

This is inappropriate because the components shown in bold relate to the built heritage only.

(iv) *be an outstanding example of a type of **building, architectural** or technological ensemble or landscape which illustrates (a) significant stage(s) in human history* (bold by the author).

This again shows the prioritization of the built heritage.

(vi) *be directly or tangibly associated with events or living traditions, with ideas, or with beliefs, with artistic and literary works of outstanding universal significance.*

Because the Palaeolithic and Pleistocene are so far removed from the present (hence its fascination for its investigators and the public), there cannot be any connection with the concept of living traditions, or with artistic and literary works of outstanding universal significance.

It could be argued, however, that palaeoanthropology and Palaeolithic archaeology are “living traditions” since these have been practised for at least two centuries, and any major research investigation will take account of the historical background. This criterion could therefore be used to include some insights into the history of discovery, and the ethical and philosophical practices related to human evolution as intangible heritage. Good examples would be the historical and intellectual background to the discovery of *Pithecanthropus erectus* (now *Homo erectus*) at Trinil, Indonesia, in 1891, and the discovery of *Australopithecus africanus* at Taung, South Africa, in 1924.

*(vii) contain superlative natural phenomena or areas of exceptional natural beauty and aesthetic importance.*

This is inappropriate because it is subjective, and the value of a palaeolithic site or human skeletal discovery is not connected with how people might envisage today the landscape in which it is found, and which would in any case bear little relation to the landscape that existed at the time when Palaeolithic material or a skeletal fragment was preserved. The informative capacity of a landscape, beautiful or not, lies in its ability to illustrate long-term records of natural and cultural interaction impacted by climate change during and even before the Pleistocene.

In order for a global narrative of human evolution to emerge, it is essential that the WHC criteria are modified so that they are appropriate for these types of sites, especially those in open-air situations in eroding landscapes. Natural criteria should recover the interaction between nature and human beings as stated by the Operational Guidelines of the Convention until 1992.

Achievements

#### **IV.ii. The achievements of the International Cooperation in the framework of the Thematic WH HEADS programme**

I have demonstrated how HEADS:

- promoted a transcultural identification process concerning the origins of our human history;

- defines Pleistocene deposits as potential cultural sites with added natural value, or vice versa, as natural sites with a cultural added value;
- is about tangible and intangible heritage, regardless of the movable or immovable nature of the attributes. The formation of the deposit makes the distinction irrelevant. Movable and immovable heritage form a single unit when justifying authenticity and integrity;
- contributed to changing the image of a static depositional process and underlined the dynamic nature of the earliest sites;
- recognized the inherent aspects of interdependency between disciplines and stimulated a cross-fertilization between methodologies of defining OUV according to the regional needs and circumstances;
- promoted a global Tentative List for human evolution, by a scientific, interdisciplinary and international process.
- faced the weak relationship between prehistoric archaeological sciences and conservation practice in a proactive world-wide international arena;
- successfully brought heritage doctrine and practice to the interface of culture and nature.

In addition:

- HEADS demonstrates how researchers could contribute to create a sense of community beyond their immediate research and undertake a public service through the World Heritage Convention;
- HEADS celebrates the inherent scientific value of the human agency during Pleistocene times;
- HEADS tried to reach a profitable dialogue across professional scientific and heritage conservation disciplines. The heritage of Human Evolution obliges heritage sub-disciplines to merge their practices, even if it was not always desirable. Advisory bodies should re-imagine and transform their practice through Pleistocene heritage as a matter of principle and transparency;
- HEADS showed how good science is a fundamental requirement for successful heritage management and proved that a scientific multidisciplinary approach is indispensable to justify the OUV. Following the inscription, management should contribute to research and conservation;

- HEADS worked hard to ensure that conservation and applied research for conservation is incorporated into the decision-making process.

HEADS started with the conviction that interdisciplinary scientific practice should play a major role in conceptualizing human evolution narratives, while heritage studies could assist in setting up conservation guidelines, pursuing the mutual advantage of these professional worlds. The thematic programme demonstrated its capacity to merge the two perspectives.

Recommendations

#### **IV.iii. A long-term future for Pleistocene sites**

##### **IV.iii.i. New heritage category for Pleistocene sites in the WHC Convention**

Because of the very nature and character of sites related to the heritage of becoming humans this dissertation identified the need for a new conceptualization, doctrine and practice for Pleistocene sites as a new type of category. My proposal, according to the previous comprehensive argumentation, is to prepare, approve and include a new type of heritage category within the Annexe 3 of the current Operational Guidelines 2017 of the WH Convention (currently titled “*Guidelines for the Inscription of Specific Types of Properties on the World Heritage List*”).

-Recommendations for the justification of the OUV

In terms of justification of the criteria for inscription, I propose that a Pleistocene site requires including the following documentation in the candidature file (format revisited from Dennell 2012, 80):

Relevant to: *pre-Homo, early Homo; Homo sapiens (indicate which)*

- *Time-span/Age:*
- *Attributes Present/absent*
- *Dating: PalaeoMag/K-A, Ar-Ar, Th-U, C14, biostratigraphy, other (when dated, and how many dating methods); quality of dating work*
- *Primary evidence: apes-hominin skeletal remains and their significance with related documentary records*



- Primary evidence: material culture (stone/bone/other) and its significance with related documentary records
- Primary evidence: *evidence of diet (butchered animal remains, plants foods, shell-fish, fish, etc.)* and its significance for related documentary records
- *Other types of primary evidence (symbolism, art, organic etc.; ochre, fossil footprints)* and its significance for related documentary records
- *Secondary evidence: environmental data (e.g. small mammals, pollen, paleo-soils, sediments, volcanic ash, etc.)* and its significance for related documentary records
- DNA, isotopic and other bio-chemical analyses
- *International scientific status; high quality publications (e.g. top international journals or monographs)* and peer-review; quality of research
- *Protection measures for the site(s)* and their effectiveness; *applied research for the protection of the site*
- *Applied research for the conservation or curatorship of materials; standards for curatorship and/or preservation of mobile/movable objects* and a conservation plan in place
- Justification of policies concerning the re-allocation of site contents to museums and/or research institutions
- ‘Added global value’ or international significance: in relation to comprehensive comparative analysis

Authenticity and Integrity should be assessed by international peer review.

The nomination file of a Pleistocene site should refer to the full range of techniques and methodologies currently applicable. A Pleistocene site is not only an archaeological site since archaeological methodology in *stricto sensu* is not the only technique to reveal the OUV of a site. The collaboration between scientific disciplines and the related research methodologies implies reconciling results or contested results at one single site. Controversies should be solved before preparing a nomination dossier. The candidature file should inform under peer review scientific standards. The full battery of available apps, software, mathematic modeling, and drone images helps in obtaining a better understanding of the dynamic nature of sites related to the early stages of our human evolution. This kind of precision digging could better contribute to give us a adaptations and dispersal context of the migratory trends of prehuman

and human species and could better decipher the biological and cultural diversity of the co-evolution culture/nature, of the use of the exploitable mineral and of the full typology of the biological resources of the early communities. Pleistocene studies require a permanent scientific multidisciplinary updating of knowledge and practice. For the reconstruction of the physical landscapes quaternary scientists, geologist, geomorphologists, marine geologists, glacial experts are needed. New GIS survey methods, digital landscape reproduction, micro-morphological analyses, detailed digging of layers and sequences, geology, topography, ecology, and palaeo-demography have a role in the identification of the OUV of the site. Geophysics, geo-electrics, electromagnetism, geo-acoustics, mechanic perforations in open air sites and in caves need skilled engineering. Petroarchaeology could be key to understand the behaviour of hunter-gatherer communities, moving to define foraging radius for mineral and biological provisions.

Documentary protocols about habitat traces, bones, lithics, fire traces, pollen, genes, and whatever trace of intentional depositions, symbolic traces, art, should be in place. In terms of integrity, any single component of the site should be recorded, and the track clearly identified and available for research and conservation purposes. Lithic technology/ies as well as the full analysis of organic and mineral data is needed to explore uses and functions and contribute to understand the fossilization processes. Micro-residues production processes or organic pigments chemical studies are as well used. Physical anthropologists, dating of organics and inorganics records, isotopes analyses, thermoluminescence, dendrochronology, c14, c14 calibrated should contribute to justify OUV and conditions of integrity and authenticity. Sediments, palaeopedology and micromorphology of soils, as well as environmental changes should be studied and recorded. Palaeontological studies for macro and micro mammals, archaeology, taxonomic and taphonomic data to define the age at death. Seasonality or the way to reconstruct the human/non-human hunting-food behaviour can contribute to value the character of prehuman and human presence at the site. Archaeo-malacology for coastal early sites and archaeobotany could be used as well. Taphonomy is essential to reconstruct the formation processes of the site and fossilization of testimonies. And last and not least Palaeogenetics that can recover aDNA in morphologically or non-morphologically identified bones. The combinations in this huge technical panoply could start developing a narrative in terms of early pre-human and human ecology. Tiny sites, invisible but significative traces, extremely vulnerable materials, deep antiquity that registered many types of alterations make the task challenging. If those techniques should reveal the OUV of the sites, some other

techniques should be developed accordingly to preserve that knowledge. This field is still a matter of research and the direct and indirect consequences should be matter of discussion by the international community, as we discussed before.

#### **IV.iii.ii. Integrated conservation for World Heritage Pleistocene sites**

Ethics, techniques and applied research for Pleistocene heritage preservation needs a proper arena and is not yet in place. Conservation refers to all measures undertaken to preserve a site, setting and associated heritage components. The preservation of physical evidence that demonstrates the process of evolution, early human creativity and cultural accomplishment is not yet a field that is universally accepted or which uses standard practices. An interdisciplinary approach to a conservation that is based on the full understanding of the formation of the site and its cultural and natural context is not yet universally accomplished. Practices are still primarily oriented to architectural preservation. UNESCO, ICOMOS, ICCROM, and the Getty Conservation Institute have been actively working to define an archaeological conservation doctrine over the last 50 years but their archaeological practice refers to a concept of built heritage. Some general principles are appropriate for early prehistoric sites but the specific principles and practices relating to monuments are not suitable for the specificity of Pleistocene sites. Archaeological excavations do not always include conservationists, although conservation is one of the most fundamental principles and precepts for heritage professionals. The nature of conservation practices in national laws has been more reactive than proactive, as referred to in international charters and standard setting texts. Research papers do not include conservation practices and very few conservation publications detail the entire conservation process of tangible and intangible heritage preservation. Minimalistic presence of applied research for conservation appears in bibliography. More work on conservation practice looks at the material culture on uses and physical preservation of the findings but preserving knowledge needs the interconnection between container and contents. 24 articles over the last 10 years are related to Pleistocene conservation practices in Conservation and Management of Archaeological sites: <https://www.tandfonline.com/action/doSearch?AllField=Pleistocene&SeriesKey=ycma20> and much of the conservation practice remains unpublished, and this is an obstacle to professionals' discussion.

#### - Recommendations on Conservation

Pleistocene sites need the preservation of the full knowledge about them. Conservation methods should be in place at every step of the research. Site deterioration begins during digging. A range of interventions such as stabilization, documentation, restoration, reburial and monitoring practices, should be in place from the beginning. Information about the planning of the intervention and further execution is essential as part of the permanent record of information. As explained already, the distinction between movable and immovable heritage is artificial and not helpful for research and conservation purposes. Full records of as-found conditions and the decision-making process of the excavations should always be available for conservation and management purposes. Photo-documentation, survey material, non-computer-generated drawings or sketches, digging notebooks, computer imaging should be carefully catalogued and archived; where possible, paper records should be converted into digital format. All computer records should be backed up, with copies stored in a different building. Re-investigation of previously excavated areas requires re-examination of the full project documentation. Documentation on provenience, composition, deterioration mechanisms, and whatever conservation treatments undertaken, should be available at any moment of the decision-making process. Substance or mechanical impacts could have altered the physical, chemical or mechanical properties of site materials and make those not suitable for further research. Ventilation, de-humidification, prevention of corrosion, fire, flooding, infestation and theft should be foreseen by a risk and hazard analysis. Additionally, with museum collections, great care needs to be taken that labels, bags and inks have a long-life and (especially in tropical contexts) be insect proof.

Conservation practices should envisage in situ protection to retard deterioration by using backfilling, shelters, structural reinforcement, or relocation. Preventive conservation should be in place. Planned excavations should develop contingency excavation and post excavation conservation plans. Excavation and conservation plans should be jointly proposed and should be simultaneously approved. A plan of integrated conservation of artefacts in situ and ex-situ should be included. Whatever preservation measure is taken should not preclude future interventions. Conservation techniques and interventions should be reversible, and conditions of reversibility need to be clarified before any intervention. Additionally, reburial of sites after excavation and removal of the materials to a museum or temporary site stock facility are important decisions and require sound practices and further discussion by the full site management team.

The site manager should have a comprehensive understanding of the historical, cultural, material environmental context of the site and should follow a conservation plan, which is not the responsibility of one specific professional but involves all members of a project and must be fully incorporated in all research methodologies, management and presentation-interpretation practices. Tourism visitation should not compromise or damage sites if visits risk endangering the preservation of the intrinsic values of the site or obstructs current or future research and conservation requirements.

With most key discoveries, there is a mass of other information that is usually analysed but not put on display: for example, sediment samples, faunal evidence, and most of the lithics. Unlike most other research into heritage sites, the methodologies for extracting new information are improving all the time. This is particularly true of palaeo-genetics – e.g. the new ZooMS technique (zoological mass spectrometry) which can extract genetic information from the tiniest scrap of bone (e.g. the Neanderthal/Denisovan hybrid at Denisova, Russian Federation, from an otherwise unidentifiable fragment) or by analyses of residues on artefacts. Therefore, nothing from an excavation should be thrown away because it might one day be useful. Storage and curatorship become major issues and should be technically and financially foreseen.

#### **IV.iii.iii.** The challenge of the long preservation of the fossil hominids remains

From discovery and recovery, fossil remains are exposed to many sources of further damage by handling, invasive sampling, non-invasive treatment (Le Cabec and Toussaint 2017). It is obvious that protection and research need the same ethics but not necessarily the same protocols. How can the heritage protection professionals take the best-informed decision? Because restoration techniques could be in detriment of further research, curators and researchers should work together to ensure the full historiographical traceability of taphonomic features, old and new applied invasive or non-invasive research methodologies and preservation measures that are undertaken.

Recommendations related to bones preservation:

Protocols should ensure that the documentary full memory of the preservation of bones since the discovery phase are in place before accepting further research or conservation interventions.

The success of the results after destructive sampling techniques is not always guaranteed. Some curators suggest that aDNA sampling should start first with associated non-hominid bones. New techniques for aDNA analysis as those related to dental cementum need new conservation practices. There should be controlled conditions of the storage facilities, and suitable etiquettes for individual measures for single objects to immobilize the pieces, type of plastic, textiles. Precise diachronic track of the history of interventions and treatments is key for a successful further research and related conservation. Integrated documentation protocols should be further discussed by the international community. DNA study sampling in situ should ensure strict sterile conditions. The relation between excavator and curator is essential to trace all the handling steps. These issues need further discussion.

#### **IV.iii.iv.** How to curate the molecular past?

Centres of research, stock facilities, and museums should face the challenge of preserving the heritage of biomolecular research. Genetics has profoundly affected the undertaking of Pleistocene research, but the obtaining and conservation of genetic data is not yet a fertile arena of discussion in the international community. Protocols and accepted common guidelines about the ownership, dissemination and use of genetic data should be finalised.

The Petrous bone can inform about populations' histories, diet, dental health, sex, diseases but not all at the same time since different destructive methodologies are currently in use looking at the same bone. Post-mortem treatment, collection treatments, deposition substrate need to be assessed before undertaking sampling. New research on DNA currently demonstrates that biomolecular preservation does not depend on the age of the remains or their provenience. Improved techniques could solve the problem and in the near or far future samples should be available. Some museums accept limited samples as to better understand the informative quality of the biomolecular information. Open science tendencies include a Data Management Plan *that includes a strategy and roadmap for data survey, collection, management, backup and release to field-standard genomic data repositories* (Austin et al. 2019).

#### Recommendations

Genome-wide datasets of ancient human samples, palaeo-genomics, palaeo-microbiology, and datasets of biomolecules provide important insights into our human past. Ethics should play a

role when science contradicts oral traditions or could not justify territorial or repatriation claims. Remains that contain isotopes, proteins, DNA, or metabolites are under pressure. This discussion goes beyond the damage caused by destructive methods or by sampling decisions. Biomolecular heritage is finite as well. Archaeobotany, zooarchaeology and palaeoanthropology are essential for the study of our species' history. Criteria should be in place to ensure the long-term preservation of collections as drivers of this knowledge. In this respect in 2018 the meeting of the Society of American Archaeology underlined the need of an open dialogue for standards and policies at the session of Biomolecules and Museum Collections: Challenges and Best Practices for Destructive Sampling. Examples on how heritage institutions adapt to new research methodologies, data and practice were discussed. If museums, archives, collections can envisage meeting those challenges, the WH Convention doctrine should do so.

According to the Free, Prior and Informed Consent (FPIC), Indigenous descendants should be informed and requested for permission when palaeo-genomics research is being undertaken, not only because as a technique it is destructive for teeth, bones, hair, soft tissues or faeces, but because of the further use of the information. Research protocols should be negotiated since the beginning of a research project and results should come back to the related community/ies. Museums have shown how they could be facilitators of this encounter.

The international Pleistocene heritage community should discuss and plan how to get the best balance among scientific knowledge, indigenous or descendant interest or concerns, and what should be preserved for a future generation by non-destructive techniques and by keeping the right balance between scientific and social benefits. Indigenous communities should receive back the full aDNA data and should be consulted over further use of the data. Compilation of best practices should be the first step of international standard setting. A code of ethics for aDNA surveys in living societies should be incorporated to the UN standard setting texts, when appropriate (See *Annex II*, Human Rights, Bioethics).

#### **IV.iii.v. *In situ* and *Ex situ* curatorial practices**

When considering human evolution and Palaeolithic sites, it is necessary for the emphasis to shift from the place of discovery to the museum in which the evidence is displayed and set in its appropriate context so that the public can appreciate its significance. As an example, the

National Museums in Kenya and Ethiopia showcase their key skeletal and archaeological evidence and provide clear explanations of their meaning and value. Zhoukoudian, China, or Schöningen, Germany, are good examples of complementarity between site and museography facilities and an added value to the visit is to experience the current archaeological in situ research.

### Recommendations

One major advantage of shifting the presentation of a property from the place of discovery to the museum in which the evidence is presented is that it reduces/eliminates the site pressure and related erosion caused by mass tourism; adequate facilities can distribute fluxes in tourist numbers and enable people to meet their expectations and enjoyment. In an age of global travel, tourism can easily endanger what we are trying to conserve. Palaeolithic cave art is an obvious example, hence the replica caves at Lascaux and Chauvet to keep tourists away from the originals, while offering a very sophisticated and informative replica with a clear explanation on why preservation of the original is only possible by excluding the public. Authenticity is not related with the physical experience of the visit but to the quality of the meaningful experience. The isolation of the earliest sites with fossil exposures – e.g. Koobi Fora, Kenya, Afar Triangle, Ethiopia, – keep the site out of the reach of international tour operators. Special protocols for Pleistocene site visits should be developed.

Virtual reality, computer-generated imagery (CGI) should be better exploited at Pleistocene sites. Shuidonggou, North China, provides a good example: there is not much to be seen at the sites themselves, but the museum theatre runs a holographic display of the four seasons in an ice age, and even includes the monsoon and an earthquake where the entire floor shakes; museum displays are good at showing the geological formation processes and history of the human agency with the natural local context and its significance. Major opportunities are now available via 3D printing: e.g. skeletal evidence and much of the archaeology can be replicated and handled (obviously under supervision) by the public – there is no reason why they should not handle a 3D-printed skull or printed examples of stone tools.

In a small number of cases, museums and research laboratories can be incorporated into the site. As example, the La Brea Tar Pits in Los Angeles features an adjacent museum containing examples of the skeletons of the animals that died in it, and also a laboratory where the public can watch specialists working on the study and conservation of the fossils. Educational



permanent facilities and programmes should be in place. An exceptional case is Casale dei Pazzi, near Rome, Italy, where Pleistocene takes part in the life of a peripheral quartier on daily basis and where Prehistory became a wonderful pretext to create a sense of neighbourhood and a community of interest in favour of our most remote past.

#### **IV.iii.vi. Biological-Cultural Evolution, a common avenue for future research**

Genetic engineering technology will soon be able to move genes from one species to another. At that moment the concept of species could become meaningless. What will be the responsibility of humans if the machinery of biological evolution does not evolve by its own? Can cultural evolution damage and endanger natural diversity and cultural diversity? Could cultural evolution ensure a sense of humanity that includes the diversity of human societies? Artificial intelligence could develop in such a way that it prevents cultural evolution being the main force driving our future.

Unexpected directions of cultural evolution are discussed by Goodenough, Dawkins and Pääbo among others: *The driving force of evolution changed from biology to culture 50,000 years ago and the direction changed from one of diversification to the unification of species. The understanding of this story should help us to deal more wisely with our responsibilities as stewards of our planet. Are we arriving at the moment when biological evolution must be protected from the homogenizing effects of cultural evolution?* ([https://www.edge.org/conversation/freeman\\_dyson-biological-and-cultural-evolution](https://www.edge.org/conversation/freeman_dyson-biological-and-cultural-evolution)).

Cultural evolution on-going process should permanently guide a common understanding of being humans by preserving, respecting and enhancing bio-cultural diversity. That has been the objective and mandate of the UN over the last seven decades. Our Pleistocene Heritage, if globally preserved, could show us how cultural evolution co-worked with natural diversity for a mutual understanding of diverse societies. Diversity is a capital and human species the enabler to reproduce it

#### **Recommendation**

Pleistocene sites could set up the first ever UN standard setting text on Bio-cultural Human Evolution Heritage, in the framework of the Post 2020 world negotiations on climate change.

World Heritage Pleistocene sites should accommodate new research hypothesis and accept that OUV could vary over time. The HEADS Thematic *Programme* informed on our largest and longest full continuum of human interaction with nature. These pages have demonstrated how science is not as divided as heritage doctrine and can develop a multilateral agenda for the years to come. I hope this dissertation contributes to this global endeavor.

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AFRICA												
#	Country	Site Name	WHL link	DOI	Criteria	Chronology	Description	Category	Large sequence	OUV directly related to HEADS	Factors affecting the property according last WHC conservation report	Perioding Reporting Cycle
1	Botswana	Tsodilo	<a href="http://whc.unesco.org/en/list/1021">http://whc.unesco.org/en/list/1021</a>	2001	(i), (iii), (vi)	100,000 BP	With one of the highest concentrations of rock art in the world, Tsodilo has been called the "Louvre of the Desert". Over 4,500 paintings are preserved in an area of only 10 km <sup>2</sup> of the Kalahari Desert. The archaeological record of the area gives a chronological account of human activities and environmental changes over at least 100,000 years. Local communities in this hostile environment respect Tsodilo as a place of worship frequented by ancestral spirits.	C	Yes	YES: Criterion (i) For many thousands of years the rocky outcrops of Tsodilo in the harsh landscape of the Kalahari Desert have been visited and settled by humans, who have left rich traces of their presence in the form of outstanding rock art.		No
2	Chad	Ennedi Massif: Natural and Cultural Landscape	<a href="http://whc.unesco.org/en/list/1475">http://whc.unesco.org/en/list/1475</a>	2016	(iii), (vii), (ix)	12,000 BP - present	Human history can be traced in the region since the Holocene (from 12000 BP onwards), thanks to archaeological, paleobotanical and related research: the rock art in particular bears witness to human adaptation to changing climatic conditions. Humans made their livelihood through hunting, fishing, gathering, and livestock farming (from the 6th millennium BCE) and later on agriculture, in an era which remains to be established, possibly around the 1st millennium BCE, when millet cultivation developed south-west of Lake Chad, and the rock art attests to some of their hunting and pastoral activities.	M	Yes	Criterion (iii): This criterion is justified by the State Party on the grounds that the rock art in the Ennedi Massif represents the human evolution in this area over a long span of time (7,000 years). This evolution is represented by the different artistic periods – the périodes archaïque, bovidienne and cameline – which include 16 styles, and illustrate the uninterrupted human occupation of the area and different stages of human evolution, from huntergatherers, through to early herders, to nomadism. The rock art figures also bear witness to the climatic changes occurring during the Holocene. The justification for this criterion also mentions that certain grottoes are still in use by nomadic groups of herders.	2008: Management systems/ management plan	No
3	Ethiopia	Lower valley of the Awash	<a href="https://whc.unesco.org/en/list/10">https://whc.unesco.org/en/list/10</a>	1980	(ii)(iii)(iv)	4 millions years old	The Awash valley contains one of the most important groupings of palaeontological sites on the African continent. The remains found at the site, the oldest of which date back at least 4 million years, provide evidence of human evolution which has modified our conception of the history of humankind. The most spectacular discovery came in 1974, when 52 fragments of a skeleton enabled the famous Lucy to be reconstructed.	C		Criterion (ii): The evidence of hominid and animal fossil remains discovered in the Lower Awash Valley testify to developments in human evolution that have modified views of the history of mankind as a whole.  1996: Criterion (iii): The excavated paleo-anthropological remains from the Lower Awash Valley dating back almost 4 million years are of exceptional antiquity.  Criterion (iv): The human vestiges that have been excavated dating back over 3 million years provide an exceptional record that contributes to an understanding of human development.	Human resources interpretative and visitation facilities Management systems/ management plan	Yes: 2001
4	Ethiopia	Lower valley of the Omo	<a href="https://whc.unesco.org/en/list/17">https://whc.unesco.org/en/list/17</a>	1980	(iii)(iv)	3.5 millions years - 1 million year old	A prehistoric site near Lake Turkana, the lower valley of the Omo is renowned the world over. The discovery of many fossils there, especially Homo gracilis, has been of fundamental importance in the study of human evolution.	C		Criterion (iii): Evidence from the Lower Omo Valley pre-historic and paleo-anthropological site have provided a unique insight into the oldest known technical activities by pre-historic beings.  Criterion (iv): Discoveries from the Lower Omo Valley represent exceptional developments in the domain of cultural activities in the pre-historic time.	2018: Crop production Erosion and siltation/ deposition Housing Industrial areas Land conversion Management systems/ management plan Water infrastructure	Yes: 2001

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5	Gabon	Ecosystem and Relict Cultural Landscape of Lopé-Okanda	<a href="http://whc.unesco.org/en/ls/1147">http://whc.unesco.org/en/ls/1147</a>	2007	(iii), (iv), (ix), (x)	Neolithic, Iron Age	The Ecosystem and Relict Cultural Landscape of Lopé-Okanda demonstrates an unusual interface between dense and well-conserved tropical rainforest and relict savannah environments with a great diversity of species, including endangered large mammals, and habitats. The site illustrates ecological and biological processes in terms of species and habitat adaptation to post-glacial climatic changes. It contains evidence of the successive passages of different peoples who have left habitations and comparatively well-preserved remains of working and a remarkable collection of some 1,800 petroglyphs (rock carvings). The property's collection of Neolithic and Iron Age sites, together with the rock art found there, reflects a major migration route of Bantu and other peoples from West Africa along the river Ogooué valley to the north of the dense evergreen Congo forests and to central east and southern Africa, that has shaped the development of the whole of sub-Saharan Africa.	M	Yes	YES; OUV: The National Park includes the River Ogooué valley, one of the principle migration routes for the diffusion of people and languages, including the Bantu, to Central and Southern Africa, in the Neolithic and Iron Age, as evidenced in extraordinary number of substantial settlements sites and an extensive collection of rock art petroglyphs.	2017: Ground transport infrastructure Human resources Illegal activities Major linear utilities Management systems/ management plan	No
6	Kenya	Lake Turkana National Parks	<a href="https://whc.unesco.org/en/ls/1801">https://whc.unesco.org/en/ls/1801</a>	1997	(vii)(x)	4million to 10,000 years old	At Kobi Fora to the north of Allia Bay, extensive paleontological finds have been made, starting in 1969, with the discovery of Paranthropus boisei. The discovery of Homo habilis thereafter is evidence of the existence of a relatively intelligent hominid two million years ago and reflect the change in climate from moist forest grassland when the now petrified forest were growing to the present hot desert. The human and pre-human fossils include the remains of five species, Australopithecus anamensis, Homo habilis/rudolfensis, Paranthropus boisei, Homo erectus and Homo sapiens all found within one locality. These discoveries are important for understanding the evolutionary history of the human species.	N		Criterion (vii): The geology and fossil record represents major stages of earth history including records of life represented by hominid discoveries, presence of recent geological process represented by volcanic erosional and sedimentary land forms. This property's main geological features stem from the Pliocene and Holocene periods (4million to 10,000 years old). It has been very valuable in the reconstruction of the paleo-environment of the entire Lake Turkana Basin. The Kobi Fora deposits contain pre-human, mammalian, molluscan and other fossil remains and have contributed more to the understanding of human ancestry and paleo-environment than any other site in the world.	2018: Illegal activities Land conversion Livestock farming/ grazing of domesticated animals Oil and gas Water infrastructure Management systems/ management plan	No
7	Lesotho; South Africa	Maloti-Drakensberg Park	<a href="http://whc.unesco.org/en/ls/1885">http://whc.unesco.org/en/ls/1885</a>	2000	(i), (iii), (vii), (x)		The site has exceptional natural beauty in its soaring basaltic butresses, incisive dramatic cutbacks, and golden sandstone ramparts as well as visually spectacular sculptured arches, caves, cliffs, pillars and rock pools. The site's diversity of habitats protects a high level of endemic and globally important plants. The site harbors endangered species such as the Cape vulture (Gyps coprotheres) and the bearded vulture (Gypaetus barbatus). Lesotho's Sehlabathebe National Park also harbors the Maloti mimow (Pseudobarbus quathlambae), a critically endangered fish species only found in this park. This spectacular natural site contains many caves and rock-shelters with the largest and most concentrated group of paintings in Africa south of the Sahara. They represent the spiritual life of the San people, who lived in this area over a period of 4,000 years.	M	Yes	YES; Criterion (i): The rock art of the Maloti-Drakensberg Park is the largest and most concentrated group of rock paintings in Africa south of the Sahara and is outstanding both in quality and diversity of subject; Criterion (iii): The Drakensberg area for more than four millennia, leaving behind them a corpus of outstanding rock art, providing a unique testimony which throws much light on their way of life and their beliefs.	2017: Interpretative and visitation facilities Legal framework Major visitor accommodation and associated infrastructure Management activities Management systems/ management plan	No

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8	Malawi	Chongoni Rock-Art Area	<a href="http://whc.unesco.org/en/lisi/476">http://whc.unesco.org/en/lisi/476</a>	2006	(iii), (vi)	Stone Age-20th Century	Situated within a cluster of forested granite hills and covering an area of 126.4 km <sup>2</sup> , high up the plateau of central Malawi, the 127 sites of this area feature the richest concentration of rock art in Central Africa. They reflect the comparatively scarce tradition of farmer rock art, as well as paintings by Ba'twa hunter-gatherers who inhabited the area from the late Stone Age. The Chewa agriculturalists, whose ancestors lived there from the late Iron Age, practised rock painting until well into the 20th century. The symbols in the rock art, which are strongly associated with women, still have cultural relevance amongst the Chewa, and the sites are actively associated with ceremonies and rituals.	C		YES; Criterion (iii): The dense and extensive collection of rock art shelters reflects a remarkable persistence of cultural traditions over many centuries, connected to the role of rock art in women's initiations, in rain making and in funeral rites, particularly in the Chewa agricultural society. Criterion (vi): The strong association between the rock art images and contemporary traditions of initiation and of the Nyau secret society, and the extensive evidence for those traditions within the painted images over many centuries, together make the Chongoni landscape a powerful force in Chewa society and a significant place for the whole of southern Africa.		No
9	Namibia	Twyfelfontein or /U//aesi	<a href="http://whc.unesco.org/en/lisi/1265">http://whc.unesco.org/en/lisi/1265</a>	2007	(iii), (v)	Last 2,000 years	Twyfelfontein or /U//aesi has one of the largest concentrations of (...) petroglyphs, i.e. rock engravings in Africa. Most of these well-preserved engravings represent rhinoceros. The site also includes six painted elephant, ostrich and giraffe, as well as drawings of human and animal footprints rock shelters with motifs of human figures in red ochre. The objects excavated from two sections, date from the Late Stone Age. The site forms a coherent, extensive and high-quality record of ritual practices relating to hunter-gatherer communities in this part of southern Africa over at least 2,000 years, and eloquently illustrates the links between the ritual and economic practices of hunter-gatherers.	C		YES; Criterion (iii): The rock art engravings and paintings in Twyfelfontein form a coherent, extensive and high quality record of ritual practices relating to hunter-gather communities in this part of southern Africa over at least two millennia; Criterion (v): The rock art reflects links between ritual and economic practices in the apparent sacred association of the land adjacent to an aquifer as a reflection of its role in nurturing hunter-gather communities over many millennia.		No
10	Niger	Air and Ténéré Natural Reserves	<a href="https://whc.unesco.org/en/lisi/573/">https://whc.unesco.org/en/lisi/573/</a>	1991	(vii)(ix)(x)		Estas reservas se extienden por una superficie de 7.700.000 hectáreas y forman la zona natural protegida más vasta de toda África, aunque el santuario propiamente dicho sólo abarca una sexta parte de esa extensión. El sitio comprende el macizo volcánico del Air, el este sahariano situado en medio del desierto sahariano del Ténéré, con un clima, flora y fauna totalmente singulares. La variedad de los paisajes y las especies vegetales y animales de las reservas es excepcional.	N		No  2018: Civil unrest Erosion and siltation/ deposition Forestry /wood production Human resources Identity, social cohesion, changes in local population and community Illegal activities Livestock farming / grazing of domesticated animals Management activities Management systems/ management plan	Yes: 2001	
11	South Africa	Fossil Hominid Sites of South Africa	<a href="https://whc.unesco.org/en/lisi/915">https://whc.unesco.org/en/lisi/915</a>	1999	(ii)(vi)	4.5 million -1 million years ago	The Taung Skull Fossil Site, part of the extension to the site inscribed in 1999, is the place where in 1924 the celebrated Taung Skull – a specimen of the species Australopithecus africanus – was found. Makapan Valley, also in the site, features in its many archaeological caves traces of human occupation and evolution dating back some 3.3 million years. The area contains essential elements that define the origin and evolution of humanity. Fossils found there have enabled the identification of several specimens of early hominids, more particularly of Paranthropus, dating back between 4.5 million and 2.5 million years, as well as evidence of the domestication of fire 1.8 million to 1 million years ago.	C		Criterion (ii): The nominated serial site bears exceptional testimony to some of the most important Australopithecine specimens dating back more than 3.5 million years. This therefore throws light on to the origins and then the evolution of humankind, through the hominisation process	2017: Ground water pollution Mining Surface water pollution Water (rain/water table) Other Threats: Acid mine drainage; Climate change and severe weather events	No

AFRICA												
#	Country	Site Name	WHL link	DOI	Criteria	Chronology	Description	Category	Large sequence	OUV directly related to HEADS	Factors affecting the property according last WHC conservation report	Perioding Reporting Cycle
12	South Africa	#Khomani Cultural Landscape	<a href="https://whc.unesco.org/en/lisli/1545">https://whc.unesco.org/en/lisli/1545</a>	2017	(v)(vi)	Stone Age - present	The #Khomani Cultural Landscape is located at the border with Botswana and Namibia in the northern part of the country, coinciding with the Kalahari Gemsbok National Park (KGNP). The large expanse of sand contains evidence of human occupation from the Stone Age to the present and is associated with the culture of the formerly nomadic #Khomani San people and the strategies that allowed them to adapt to harsh desert conditions. They developed a specific ethnobotanical knowledge, cultural practices and a worldview related to the geographical features of their environment. The #Khomani Cultural Landscape bears testimony to the way of life that prevailed in the region and shaped the site over thousands of years.	C		Yes: Until fairly recently the #Khomani Cultural Landscape was the domain of the hunter-gatherer people. A culture, recognisable as San, emerged throughout southern Africa some 20,000 years ago, the descendants of an ancient lineage of hunter-gatherers that had diverged from the other human populations some 100,000 years ago. This was well before the migration of modern humans out of Africa and the San therefore retain more ancient DNA than any other population group in the world.		No
13	United Republic of Tanzania	Kondoa Rock-Art Sites	<a href="http://whc.unesco.org/en/lisli/1183">http://whc.unesco.org/en/lisli/1183</a>	2006	(iii), (vi)	Last 2 millennia	On the eastern slopes of the Masai escarpment bordering the Great Rift Valley are natural rock shelters, overhanging slabs of sedimentary rocks fragmented by rift faults, whose vertical planes have been used for rock paintings for at least two millennia. The spectacular collection of images from over 150 shelters over 2,336 km <sup>2</sup> , many with high artistic value, displays sequences that provide a unique testimony to the changing socio-economic base of the area from hunter-gatherer to agro-pastoralist, and the beliefs and ideas associated with the different societies. Some of the shelters are still considered to have ritual associations with the people who live nearby, reflecting their beliefs, rituals and cosmological traditions.	C		YES; Criterion (iii): The rock art sites at Kondoa are an exceptional testimony to the lives of hunter-gatherers and agriculturalists who have lived in the area over several millennia, and reflect a unique variation of hunter-gatherer art from southern and central Africa and a unique form of agro-pastoralist paintings; Criterion (vi): Some of the rock art sites are still used actively by local communities for a variety of ritual activities such as rainmaking, divining and healing. These strong intangible relationships between the paintings and living practices reinforce the links with those societies that created the paintings, and demonstrate a crucial cultural continuum.		No
14	United Republic of Tanzania	Ngorongoro Conservation Area	<a href="https://whc.unesco.org/en/lisli/29">https://whc.unesco.org/en/lisli/29</a>	2010	(iv)(vii)(viii)(ix)(x)	3.6 million years	The Ngorongoro Conservation Area spans vast expanses of highland plains, savanna, woodland and forests. Established in 1959 as a multiple land use area, with wildlife coexisting with semi-nomadic Maasai pastoralists practicing traditional livestock grazing, it includes the spectacular Ngorongoro Crater, the world's largest caldera. The property has global importance for biodiversity conservation due to the presence of globally threatened species, the density of wildlife inhabiting the area, and the annual migration of wildebeest, zebra, gazelles and other animals into the northern plains. Extensive archaeological research has also yielded a long sequence of evidence of human evolution and human-environment dynamics, including early hominid footprints dating back 3.6 million years.	M		Criterion (iv): Ngorongoro Conservation Area has yielded an exceptionally long sequence of crucial evidence related to human evolution and human-environment dynamics, collectively extending from four million years ago to the beginning of this era, including physical evidence of the most important benchmarks in human evolutionary development. Although the interpretation of many of the assemblages of Olduvai Gorge is still debatable, their extent and density are remarkable. Several of the type fossils in the hominid lineage come from this site. Furthermore, future research in the property is likely to reveal much more evidence concerning the rise of anatomically modern humans, modern behavior and human ecology.	2017: Crop production Governance Ground transport infrastructure Identity, social cohesion, changes in local population and community Illegal activities Impacts of tourism / visitor / recreation Interpretative and visitation facilities Invasive/ alien terrestrial species Land conversion Livestock farming / grazing of domesticated animals Major visitor accommodation and associated infrastructure Management activities Management systems/ management plan Other Threats: Challenging situation of community livelihoods; Condition and conservation of the Laetoli hominid footprints	Yes - 2001

AFRICA												
#	Country	Site Name	WHL link	DOI	Criteria	Chronology	Description	Category	Large sequence	OUV directly related to HEADS	Factors affecting the property according last WHC conservation report	Perioding Reporting Cycle
15	Zimbabwe	Matobo Hills	<a href="http://whc.unesco.org/en/list/2006">http://whc.unesco.org/en/list/2006</a>	2003	(iii), (v), (vi)	Stone Age	The area exhibits a profusion of distinctive rock landforms rising above the granite shield that covers much of Zimbabwe. The large boulders provide abundant natural shelters and have been associated with human occupation from the early Stone Age right through to early historical times, and intermittently since. They also feature an outstanding collection of rock paintings. The Matobo Hills continue to provide a strong focus for the local community, which still uses shrines and sacred places closely linked to traditional, social and economic activities.	C	Yes	YES; Criterion (iii): The Matobo Hills have one of the highest concentrations of rock art in southern Africa. The rich evidence from archaeology and from the rock paintings at Matobo provide a very full picture of the lives of foraging societies in the Stone Age and the way agricultural societies came to replace them; Criterion (v): The interaction between communities and the landscape, manifested in the rock art and also in the long-standing religious traditions still associated with the rocks, are community responses to a landscape.	2005: Management systems/ management plan	No
16	Zambia; Zimbabwe	Mosi-oa-Tunya / Victoria Falls	<a href="https://whc.unesco.org/en/list/509">https://whc.unesco.org/en/list/509</a>	1989	(vii) (viii)	Stone Age	The Victoria Falls area is strategically situated between the two great centres of human evolutionary discoveries on this continent - East Africa and South Africa. Early human activity in the Victoria Falls area dates back at least two million years, proof of which lies in the large number of early Stone Age tools found in and around the gorges.	N		No	2017: Air pollution Drought Housing Impacts of tourism / visitor / recreation Invasive/ alien terrestrial species Major visitor accommodation and associated infrastructure Management systems/ management plan Solid waste Surface water pollution Water (extraction)	Yes - 2001

ARAB STATES												
#	Country	Site Name	WHL link	DOI	Criteria	Chronology	Description	Category	Large sequence	OUV directly related to HEADS	Factors affecting the property according last WHC conservation report	Perioding Reporting Cycle
1	Jordan	Wadi Rum Protected Area	<a href="http://whc.unesco.org/en/list/1377">http://whc.unesco.org/en/list/1377</a>	2011	(iii), (v), (vii)	10,000 BC	The 74,000-hectare property, inscribed as a mixed natural and cultural site, is situated in southern Jordan, near the border with Saudi Arabia. It features a varied desert landscape consisting of a range of narrow gorges, natural arches, towering cliffs, ramps, massive landslides and caverns. Petroglyphs, inscriptions and archaeological remains in the site testify to 12,000 years of human occupation and interaction with the natural environment. The combination of 25,000 rock carvings with 20,000 inscriptions trace the evolution of human thought and the early development of the alphabet. The site illustrates the evolution of pastoral, agricultural and urban activity in the region.	M		YES: Criterion (iii): The rock art, inscriptions and archaeological evidence in WRPA can be considered an exceptional testimony of the cultural traditions of its early inhabitants. The combination of 25,000 petroglyphs, 20,000 inscriptions, and 154 archaeological sites provides evidence to continuity of habitation and land-use over a period of at least 12,000 years.	2018: Financial resources Governance Housing Human resources Impacts of tourism / visitor / recreation Management systems/ management plan Solid waste	No
2	Saudi Arabia	Rock Art in the Hail Region of Saudi Arabia	<a href="http://whc.unesco.org/en/list/1472/">http://whc.unesco.org/en/list/1472/</a>	2015	(i), (iii)	10,000 BP	This property includes two components situated in a desert landscape: Jabel Umm Sinman at Jubbah and the Jabal al-Manjor and Raat at Shuwaymis. A lake once situated at the foot of the Umm Sinman hill range that has now disappeared used to be a source of fresh water for people and animals in the southern part of the Great Narfoud Desert. The ancestors of today's Arab populations have left traces of their passages in numerous petroglyphs and inscriptions on the rock face. Jabal al-Manjor and Raat form the rocky escarpment of a wadi now covered in sand. They show numerous representations of human and animal figures covering 10,000 years of history.	C		Criterion (i): The rock art of Jabal Umm Sinman Jubbah and Jabal Al-Major and Jabal Raat near Shuwaymis contain an exceptionally large number of petroglyphs, created by using a range of techniques with simple stone hammers, against a background of gradual environmental deterioration, and are visually stunning expressions of the human creative genius.	2017: Impacts of tourism / visitor / recreation Interpretative and visitation facilities Localised utilities Management systems/ Management plan Water infrastructure Other Threats: Visual impact of a rain water diversionary dam and of a water tower	No
3	Libya	Rock-Art Sites of Tadrart Acacus	<a href="http://whc.unesco.org/en/list/287">http://whc.unesco.org/en/list/287</a>	1985	(iii)	12,000 B.C. to A.D. 100.	On the borders of Tassili N'Ajjer in Algeria, also a World Heritage site, this rocky massif has thousands of cave paintings in very different styles, dating from 12,000 B.C. to A.D. 100. They reflect marked changes in the fauna and flora, and also the different ways of life of the populations that succeeded one another in this region of the Sahara.	C		YES: Like Tassili N'Ajjer, various periods, corresponding to successive climatic phases which brought about, underlying modifications in the flora and fauna and, thus, in the way of life of the local population, may be distinguished. They are characterized by very definite artistic styles.	2018: Deliberate destruction of heritage Human resources Illegal activities War	Yes: 2000



ARAB STATES												
#	Country	Site Name	WHL link	DOI	Criteria	Chronology	Description	Category	Large sequence	OUV directly related to HEADS	Factors affecting the property according last WHC conservation report	Perioding Reporting Cycle
4	Algeria	Tassili n'Ajjer	<a href="http://whc.unesco.org/en/list/179">http://whc.unesco.org/en/list/179</a>	1982	(i), (iii), (vii), (viii)	10,000 BC-1, 2 AD	<p>The exceptional density of paintings and engravings, and the presence of many prehistoric vestiges, are remarkable testimonies to Prehistory. From 10,000 BC to the first centuries of our era, successive peoples left many archaeological remains, habitations, burial mounds and enclosures which have yielded abundant lithic and ceramic material. However, it is the rock art (engravings and paintings) that have made Tassili world famous as from 1933, the date of its discovery. 15,000 engravings have been identified to date. Researchers estimate there are at least 15,000 individual rock-art pictures in the Park, the earliest dating tentatively to 12,000 or more years ago.</p>	M		<p>YES; Criterion (iii): The rock art images cover a period of about 10,000 years; Criterion (vii): Humans lived in this area by developing cultural and physiological behaviour adapted to the harsh climate; their vestiges date back to several hundreds of thousands of years. The rock art of Tassili n'Ajjer, is the most eloquent expression of relationships between humans and the environment, with more than 15,000 drawings and engravings testifying to climate changes, wildlife migrations, and the evolution of humankind on the edge of the Sahara.</p>		No

ASIA AND THE PACIFIC												
#	Country	Site Name	WHL link	DOI	Criteria	Chronology	Description	Category	Large sequence	OUV directly related to HEADS	Factors affecting the property according last WHC conservation report	Periodic Reporting Cycle
1	Australia	Uluru-Kata Tjuta National Park	<a href="http://whc.unesco.org/en/ls/1447">http://whc.unesco.org/en/ls/1447</a>	1994	(v), (vi), (vii), (viii)	5,000 BP - present	This park, formerly called Uluru (Ayers Rock – Mount Olga) National Park, features spectacular geological formations that dominate the vast red sandy plain of central Australia. Uluru, an immense monolith, and Kata Tjuta, the rock domes located west of Uluru, form part of the traditional belief system of one of the oldest human societies in the world. The traditional owners of Uluru-Kata Tjuta are the Anangu Aboriginal people.	M		NO: A period of "intensification" and social and cultural adaptive evolution by Anangu began some 5000 years ago, during which new tool types were introduced, new forms of rock art created, and new camping patterns established.		Yes: 2003
2	Australia	Greater Blue Mountains Area	<a href="http://whc.unesco.org/en/ls/1917">http://whc.unesco.org/en/ls/1917</a>	2000	(ix), (x)	Late pleistocene	The Greater Blue Mountains Area consists of 1.03 million ha of sandstone plateaux, escarpments and gorges dominated by temperate eucalypt forest. The site, comprised of eight protected areas, is noted for its representation of the evolutionary adaptation and diversification of the eucalypts in post-Gondwana isolation on the Australian continent. Ninety-one eucalypt taxa occur within the Greater Blue Mountains Area which is also outstanding for its exceptional expression of the structural and ecological diversity of the eucalypts associated with its wide range of habitats. The site provides significant representation of Australia's biodiversity with ten percent of the vascular flora as well as significant numbers of rare or threatened species, including endemic and evolutionary relict species, such as the Wollemi pine, which have persisted in highly-restricted microsites. Rock art studies prove the human occupation of the site since Late Pleistocene times.	N	Yes	YES	2004: Mining Surface water pollution	No
3	Australia	Kakadu National Park	<a href="http://whc.unesco.org/en/ls/1447">http://whc.unesco.org/en/ls/1447</a>	1981 (ext. 1987, 1992)	(i), (vi), (vii), (ix), (x)	40,000 YA- present	This unique archaeological and ethnological reserve, located in the Northern Territory, has been inhabited continuously for more than 40,000 years. The cave paintings, rock carvings and archaeological sites record the skills and way of life of the region's inhabitants, from the hunter-gatherers of prehistoric times to the Aboriginal people still living there. It is a unique example of a complex of ecosystems, including tidal flats, floodplains, lowlands and plateaux, and provides a habitat for a wide range of rare or endemic species of plants and animals.	M	Yes	YES; Criterion (vi) : The rock art and archaeological record is an exceptional source of evidence for social and ritual activities associated with hunting and gathering traditions of Aboriginal people from the Pleistocene era until the present day.	2005: Ground water pollution Invasive/ alien terrestrial species Mining	Yes: 2003
4	Australia	Tasmanian Wilderness	<a href="https://whc.unesco.org/en/ls/1181">https://whc.unesco.org/en/ls/1181</a>	1982	(iii), (iv), (vi), (vii), (viii), (ix), (x)	20,000 BC - Present	In a region that has been subjected to severe glaciation, these parks and reserves, with their steep gorges, covering an area of over 1,000,000 hectares, constitute one of the last expanses of temperate rainforest in the world. Remains found in limestone caves attest to the occupation of the area for more than 20,000 years	M	Yes	Yes: Criterion (iv): The region contains significant Aboriginal archaeological sites which indicates human occupation in the area about 21,000 years ago.	2018: Forestry / wood production Impacts of tourism / visitor / recreation Management systems/ management plan Mining Other Threats: Biossecurity	Yes: 2003

ASIA AND THE PACIFIC												
#	Country	Site Name	WHL link	DOI	Criteria	Chronology	Description	Category	Large sequence	OUV directly related to HEADS	Factors affecting the property according last WHC conservation report	Perioding Reporting Cycle
5	Australia	Purnululu National Park	<a href="https://whc.unesco.org/en/list/1094">https://whc.unesco.org/en/list/1094</a>	2003	(vii), (viii)	120,000 BC - 19th century AD	The 239,723 ha Purnululu National Park is located in the State of Western Australia. It contains the deeply dissected Bungle Bungle Range composed of Devonian-age quartz sandstone eroded over a period of 20 million years into a series of beehive-shaped towers or cones, whose steeply sloping surfaces are distinctly marked by regular horizontal bands of dark-grey cyanobacterial crust (single-celled photosynthetic organisms). These outstanding examples of cone karst owe their existence and uniqueness to several interacting geological, biological, erosional and climatic phenomena.	N		No: The rock art at Purnululu has yet to receive research attention equivalent to that given to other rock art sites in Australia.	2011: Financial resources Human resources Management systems/ management plan Mining	No
6	Australia	Willandra Lakes Region	<a href="https://whc.unesco.org/en/list/167">https://whc.unesco.org/en/list/167</a>	1981	(iii)(viii)	60,000 BP-45,000 BP	The fossil remains of a series of lakes and sand formations that date from the Pleistocene can be found in this region, together with archaeological evidence of human occupation dating from 45–60,000 years ago. It is a unique landmark in the study of human evolution on the Australian continent. Several well-preserved fossils of giant marsupials have also been found here	M	Yes	Criterion (iii): The drying up of the Willandra Lakes some 18,500 years BP allowed the survival of remarkable evidence of the way early people interacted with their environment. The undisturbed stratigraphy has revealed evidence of Homo sapiens sapiens in this area from nearly 50,000 years BP, including the earliest known cremation, fossil trackways, early use of grindstone technology and the exploitation of fresh water resources, all of which provide an exceptional testimony to human development during the Pleistocene period.	1995: Management systems/ management plan	Yes: 2003
7	China	Peking Man Site at Zhoukoudian	<a href="https://whc.unesco.org/en/list/449">https://whc.unesco.org/en/list/449</a>	1987	(ii)(v)	18,000-11,000 BC	Scientific work at the site, which lies 42 km south-west of Beijing, is still underway. So far, it has led to the discovery of the remains of Sinanthropus pekinensis, who lived in the Middle Pleistocene, along with various objects, and remains of Homo sapiens sapiens dating as far back as 18,000–11,000 B.C. The site is not only an exceptional reminder of the prehistorical human societies of the Asian continent, but also illustrates the process of evolution.	C		Criterion (iii): The Zhoukoudian site bears witness to the human communities of the Asian continent from the Middle Pleistocene Period to the Palaeolithic, illustrating the process of evolution.	2001: Financial resources Housing Interpretative and visitation facilities Management systems/ management plan Mining Quarrying Other Threats: Lack of maintenance ; Industrial pollution	Yes: 2003
8	Indonesia	Sangiran Early Man Site	<a href="https://whc.unesco.org/en/list/593">https://whc.unesco.org/en/list/593</a>	1996	(iii)(vi)	2.4 mill Years	Excavations here from 1936 to 1941 led to the discovery of the first hominid fossil at this site. Later, 50 fossils of Meganthropus palaeo and Pithecantropus erectus/homo erectus were found—half of all the world's known hominid fossils. Inhabited for the past one and a half million years, Sangiran is one of the key sites for the understanding of human evolution.	C		Criterion (iii): This property is one of the key sites for the understanding of human evolution that admirably illustrates the development of Homo sapiens sapiens, over two million years from the Lower Pleistocene to the present through the outstanding fossils (human and animal) and artefactual material that it has produced.  Criterion (vi): The property is displaying many aspects of very long-term human physical and cultural evolution in an environmental context. It will continue to be so and remain dynamically informative	2018: Housing Interpretative and visitation facilities Management systems/ management plan Society's valuing of heritage	No

ASIA AND THE PACIFIC												
#	Country	Site Name	WHL link	DOI	Criteria	Chronology	Description	Category	Large sequence	OUV directly related to HEADS	Factors affecting the property according last WHC conservation report	Periodic Reporting Cycle
9	India	Rock Shelters of Bhimbetka	<a href="http://whc.unesco.org/en/list/925">http://whc.unesco.org/en/list/925</a>	2003	(iii), (v)	Mesolithic - Historic Period	The Rock Shelters of Bhimbetka are in the foothills of the Vindhyan Mountains on the southern edge of the central Indian plateau. Within massive sandstone outcrops, above comparatively dense forest, are five clusters of natural rock shelters, displaying paintings that appear to date from the Mesolithic Period right through to the historical period. The cultural traditions of the inhabitants of the twenty-one villages adjacent to the site bear a strong resemblance to those represented in the rock paintings.	C		YES; Criterion (iii): Bhimbetka reflects a long interaction between people and the landscape, as demonstrated in the quantity and quality of its rock art. Criterion (v): Bhimbetka is closely associated with a hunting and gathering economy as demonstrated in the rock art and in the relics of this tradition in the local adhvasi villages on the periphery of this site.		No
10	Mongolia	Petroglyphic Complexes of the Mongolian Altai	<a href="http://whc.unesco.org/en/list/1382">http://whc.unesco.org/en/list/1382</a>	2011	(iii)	11,000 B.C.-8th Century A.D.	The numerous rock carvings and funerary monuments found in these three sites illustrate the development of culture in Mongolia over a period of 12,000 years. The earliest images reflect a time (11,000 - 6,000 BC) when the area was partly forested and the valley provided a habitat for hunters of large game. Later images show the transition to herding as the dominant way of life. The most recent images show the transition to a horse-dependent nomadic lifestyle during the early 1st millennium BC, the Scythian period and the later Turkic period (7th and 8th centuries AD). The carvings contribute valuably to our understanding of pre-historic communities in northern Asia.	C		YES; OUV: The persistent relationships between rock art, surface monuments and the larger physical context of rivers, ridges and cardinal directions create a vivid sense of the integration of human communities with the land they inhabited.		No
11	Malaysia	Archaeological Heritage of the Lenggong Valley	<a href="https://whc.unesco.org/en/list/1386">https://whc.unesco.org/en/list/1386</a>	2012	(iii)(v)	Palaeolithic, Neolithic and Metal ages	Situated in the lush Lenggong Valley, the property includes four archaeological sites in two clusters which span close to 2 million years, one of the longest records of early man in a single locality, and the oldest outside the African continent. It features open-air and cave sites with Palaeolithic tool workshops, evidence of early technology. The number of sites found in the relatively contained area suggests the presence of a fairly large, semi-sedentary population with cultural remains from the Palaeolithic, Neolithic and Metal ages.	C		Criterion (iii) : The series of cave and open air sites along the Perak River in the Lenggong Valley is an exceptional testimony to occupation of the area particularly during the Palaeolithic era, but also during the Neolithic and Bronze Age periods from 1.83 million years ago to 1,700 years ago.		No
12	Viet Nam	Trang An Landscape Complex	<a href="https://whc.unesco.org/en/list/1438">https://whc.unesco.org/en/list/1438</a>	2014	(v)(vii)(viii)	Palaeolithic, Neolithic and Metal ages	Situated near the southern margin of the Red River Delta, the Trang An Landscape Complex is a spectacular landscape of limestone karst peaks permeated with valleys, many of them partly submerged and surrounded by steep, almost vertical cliffs. Exploration of caves at different altitudes has revealed archaeological traces of human activity over a continuous period of more than 30,000 years. They illustrate the occupation of these mountains by seasonal hunter-gatherers and how they adapted to major climatic and environmental changes, especially the repeated inundation of the landscape by the sea after the last ice age. The story of human occupation continues through the Neolithic and Bronze Ages to the historical era. Hoa Lu, the ancient capital of Viet Nam, was strategically established here in the 10th and 11th centuries AD. The property also contains temples, pagodas, paddy-fields and small villages.	M	Yes	Criterion (v): Trang An is an outstanding locale within Southeast Asia, for demonstrating the way early humans interacted with the natural landscape and adapted to major changes in climatic, geographical and environmental conditions over a period of more than 30,000 years. The long cultural history is closely associated with geological evolution of the Trang An limestone massif in late Pleistocene and early Holocene times, when the inhabitants endured some of the most turbulent climatic and environmental changes in Earth history, including repeated submergence of the landscape due to oscillating sea levels. Within the one compact landscape there are many sites covering multiple periods and functions, comprising early human settlement systems.	2018: Impacts of tourism / visitor / recreation Management systems/ Management plan	No

ASIA AND THE PACIFIC												
#	Country	Site Name	WHL link	DOI	Criteria	Chronology	Description	Category	Large sequence	OUV directly related to HEADS	Factors affecting the property according last WHC conservation report	Periodic Reporting Cycle
13	Papua New Guinea	Kuk Early Agricultural Site	<a href="https://whc.unesco.org/en/lst/887">https://whc.unesco.org/en/lst/887</a>	2008	(iii)(iv)	10,000 BP	Kuk Early Agricultural Site consists of 116 ha of swamps in the western highlands of New Guinea 1,500 metres above sea-level. Archaeological excavation has revealed the landscape to be one of wetland reclamation worked almost continuously for 7,000, and possibly for 10,000 years. It contains well-preserved archaeological remains demonstrating the technological leap which transformed plant exploitation to agriculture around 6,500 years ago. It is an excellent example of transformation of agricultural practices over time, from cultivation mounds to draining the wetlands through the digging of ditches with wooden tools. Kuk is one of the few places in the world where archaeological evidence suggests independent agricultural development and changes in agricultural practice over such a long period of time.	C		Criterion (iii): The extent of the evidence of early agriculture on the Kuk site can be seen as an exceptional testimony to a type of exploitation of the land which reflects the culture of early man in the region. Criterion (iv): Kuk is one of the few places in the world where archaeological evidence suggests independent agricultural development and changes in agricultural practice over a 7,000 and possibly a 10,000 year time span.		No

EUROPE AND NORTH AMERICA												
#	Country	Site Name	WHL link	DOI	Criteria	Chronology	Description	Category	Large sequence	OUV directly related to HEADS	Factors affecting the property according last WHC conservation report	Perioding Reporting Cycle
1	Azerbaijan	Gobustan Rock Art Cultural Landscape	<a href="http://whc.unesco.org/en/ls/1076">http://whc.unesco.org/en/ls/1076</a>	2007	(iii)	Upper Paleolithic-Middle Ages	Gobustan has outstanding universal value for its rock art engravings, for the substantial evidence of the collection of rock art images presents for hunting, fauna, flora and lifestyles in pre-historic times and for the cultural continuity between prehistoric and mediaeval times that the site reflects.	C		YES, OUV: Gobustan has outstanding universal value for the quality and density of its rock art engravings, for the substantial evidence of the collection of rock art images presents for hunting, fauna, flora and lifestyles in pre-historic times and for the cultural continuity between prehistoric and mediaeval times that the site reflects.		Yes: 2014
2	Denmark	Aasivissuit – Nipisat, Inuit Hunting Ground between Ice and Sea	<a href="https://whc.unesco.org/en/ls/1557">https://whc.unesco.org/en/ls/1557</a>	2018	(v)	2500 BC - present	Located inside the Arctic Circle in the central part of West Greenland, the property contains the remains of 4,200 years of human history. It is a cultural landscape which bears witness to its creators' hunting of land and sea animals, seasonal migrations and a rich and well-preserved tangible and intangible cultural heritage linked to climate, navigation and medicine. The human history of this cultural landscape spans 4200 years. Three major migrations of Paleo-Inuit and Inuit peoples came to Greenland from present-day Canada: Saqoqaa (2500-700 BC), Greenlandic Dorset (800 BC-AD1) and Thule Inuit (from the 13th century). From the 18th century, colonists from Denmark-Norway established settlements on the island of Nipisat.	C		Criterion (v): Aasivissuit-Nipisat and the transect of environments it contains demonstrates the resilience of the human cultures of this region and their traditions of seasonal migration. The abundant evidence of culture-nature interactions over several millennia, intact and dynamic natural landscape, intangible cultural heritage and continuing hunting and seasonal movements by Inuit people and other attributes combine in this distinctive cultural landscape. This is demonstrated through the continuing uses of the west/east routes, the rich archaeological record of Paleo-Inuit and Inuit cultures, and the camps and hunting elements that enabled hunting-fishing-gathering peoples to live in the Arctic region.	No	No
3	France; Spain	Pyrenées: Mont Perdu	<a href="https://whc.unesco.org/en/ls/773">https://whc.unesco.org/en/ls/773</a>	1997	(iii)(v)(vi)(vii)(vi-ii)	40,000 BC-10,000 BC	Human settlement in this region dates back to the Upper Paleolithic period (40,000 – 10,000 B.C.) as the sites of the Ahicéo and Escuin Caves; the stone circles at Gavarnie and the dolmen at Tella bear witness. Documents from the Middle Ages have recorded these sedentary settlements in history. They were located on the slopes of the mesaf and neighbouring valleys, formed by the hydrographical river network that irrigated the fields along the valleys in the north, and the trails and roads, bridges, houses and hospices (such as the espietau/hospices of Gavarnie, Bouchardo, Aragnouet, Parzan, Héas and Pinet).	M		No		Yes: 2006; 2014
4	France	Decorated Cave of Pont d'Arc, known as Grotte Chauvet-Pont d'Arc, Ardèche	<a href="http://whc.unesco.org/en/ls/1428">http://whc.unesco.org/en/ls/1428</a>	2014	(i), (iii)	30,000–32,000 BP	Located in a limestone plateau of the Ardèche River in southern France, the property contains the earliest-known and best-preserved figurative drawings in the world, dating back as early as the Aurignacian period (30,000–32,000 BP), making it an exceptional testimony of prehistoric art. The cave was closed off by a rock fall approximately 20,000 years BP and remained sealed until its discovery in 1994, which helped to keep it in pristine condition. Over 1,000 images have so far been inventoried on its walls, combining a variety of anthropomorphic and animal motifs. Of exceptional aesthetic quality, they demonstrate a range of techniques including the skilful use of colour, combinations of paint and engraving, anatomical precision, three-dimensionality and movement. They include several dangerous animal species difficult to observe at that time, such as mammoth, bear, wildcat, rhino, bison and auroch, as well as 4,000 inventoried remains of prehistoric fauna and a variety of human footprints.	C		YES, Criterion (i): The decorated cave of Pont d'Arc, known as Grotte Chauvet-Pont d'Arc contains the first known expressions of human artistic genius and more than 1,000 drawings of anthropomorphic and zoomorphic motifs of exceptional aesthetic quality have been inventoried.	No	No
5	France	Prehistoric Sites and Decorated Caves of the Vézère Valley	<a href="http://whc.unesco.org/en/ls/85">http://whc.unesco.org/en/ls/85</a>	1979	(i), (iii)		The Vézère valley contains 147 prehistoric sites dating from the Palaeolithic and 25 decorated caves. It is particularly interesting from an ethnological and anthropological, as well as an aesthetic point of view because of its cave paintings, especially those of the Lascaux Cave, whose discovery in 1940 was of great importance for the history of prehistoric art. The hunting scenes show some 100 animal figures, which are remarkable for their detail, rich colours and lifelike quality.	C		III. The objects and the works of art found in the valley of the Vézère are extremely rare witnesses of long extinct civilisations which are very difficult to understand. This material invaluable to the knowledge of the most distant periods of the history of "man" stems from well before Antiquity, as such, dating back to the Paleolithic period. It is of universal interest exceptional from an historic, as well as ethnologic, anthropologic and aesthetic point of view.	2015: Micro-organisms	Yes: 2006; 2014

EUROPE AND NORTH AMERICA												
#	Country	Site Name	WHL link	DOI	Criteria	Chronology	Description	Category	Large sequence	OUV directly related to HEADS	Factors affecting the property according last WHC conservation report	Perioding Reporting Cycle
6	Germany	Caves and Ice Age Art in the Swabian Jura	<a href="https://whc.unesco.org/en/whl/1527">https://whc.unesco.org/en/whl/1527</a>	2017	(iii)	41,000 BC - 31,000 BC	Modern humans first arrived in Europe 43,000 years ago during the last ice age. One of the areas where they took up residence was the Swabian Jura in southern Germany. Excavated from the 1860s, six caves have revealed items dating from 43,000 to 33,000 years ago. Among them are carved figurines of animals (including cave lions, mammoths, horses and boids), musical instruments and items of personal adornment. Other figurines depict creatures that are half animal, half human and there is one statuette of a woman. These archaeological sites feature some of the oldest figurative art worldwide and help shed light on the origins of human artistic development.	C		Yes: Criterion (iii). Caves and Ice Age Art in the Swabian Jura provides an exceptional testimony to the culture of the first modern humans to settle in Europe. Exceptional aspects of this culture that have been preserved in these caves are examples of carved figurines, objects of personal adornment and musical instruments. The art objects are among the oldest yet to be found in the world and the musical instruments are the oldest that have been found to date worldwide.	No	
7	Finland; Sweden	High Coast / Kvarken Archipelago	<a href="https://whc.unesco.org/en/whl/1898">https://whc.unesco.org/en/whl/1898</a>	2000	(viii)		The Kvarken Archipelago (Finland) and the High Coast (Sweden) are situated in the Gulf of Bothnia, a northern extension of the Baltic Sea. The 5,600 islands of the Kvarken Archipelago feature unusual ridged washboard moraines, 'De Geer moraines', formed by the melting of the continental ice sheet, 10,000 to 24,000 years ago. The Archipelago is continuously rising from the sea in a process of rapid glacio-isostatic uplift, whereby the land, previously weighed down under the weight of a glacier, lifts at rates that are among the highest in the world. As a consequence islands appear and unite, peninsulas expand, and lakes evolve from bays and develop into marshes and peat fens. The High Coast has also been largely shaped by the combined processes of glaciation, glacial retreat and the emergence of new land from the sea. Since the last retreat of the ice from the High Coast 9,600 years ago, the uplift has been in the order of 285 m which is the highest known "rebound". The site affords outstanding opportunities for the understanding of the important processes that formed the glaciated and land uplift areas of the Earth's surface.	N		for two main reasons. First, both areas have some of the highest rates of isostatic uplift in the world, meaning that the land still continues to rise in elevation following the retreat of the last inland ice sheet, with around 290 m of land uplift recorded over the past 10,500 years. The uplift is ongoing and is associated with major changes in the water bodies in post-glacial times. This phenomenon was first recognized and studied here, making the property a key area for understanding the processes of crustal response to the melting of the continental ice sheet. Second, the Kvarken Archipelago, with its 5,600 islands and surrounding sea, possesses a distinctive array of glacial depositional formations, such as De Geer moraines, which add to the variety of glacial land- and seascape features in the region. It is a global, exceptional and diverse area for studying moraine archipelagos. The High Coast and the Kvarken Archipelago represent complementary examples of post-glacial uplifting landscapes.	Yes: 2013	
8	Israel	Sites of Human Evolution at Mount Carmel: The Nahal Me'arot / Wadi el-Mughara Caves	<a href="https://whc.unesco.org/en/whl/393">https://whc.unesco.org/en/whl/393</a>	2012	(iii)(v)	Middle paleolithic	Situated on the western slopes of the Mount Carmel range, the site includes the caves of Tabun, Jamal, el-Wad and Skhul. Ninety years of archaeological research have revealed a cultural sequence of unparalleled duration, providing an archive of early human life in south-west Asia. This 54 ha property contains cultural deposits representing at least 500,000 years of human evolution demonstrating the unique existence of both Neanderthals and Early Anatomically Modern Humans within the same Middle Palaeolithic cultural framework, the Mousterian. Evidence from numerous Natufian burials and early stone architecture represents the transition from a hunter-gathering lifestyle to agriculture and animal husbandry. As a result, the caves have become a key site of the chrono-stratigraphic framework for human evolution in general, and the prehistory of the Levant in particular.	C		Criterion (iii) : The site of the Nahal Me'arot/ Wadi el-Mughara Caves displays one of the longest prehistoric cultural sequences in the world. From the Acheulean complex, at least 500,000 years BP, through the Mousterian culture of 250,000-45,000 years BP, and up to the Natufian culture of 15,000-11,500 years BP and beyond, it testifies to at least half a million years of human evolution. Significantly, the site demonstrates the unique existence of both Neanderthals and Early Anatomically Modern Humans (EAMH) within the same Middle Palaeolithic cultural framework, the Mousterian. As such, it has become a key site of the chrono-stratigraphic framework for human evolution in general, and the prehistory of the Levant in particular. Research at Nahal Me'arot/ Wadi el-Mughara Caves has been ongoing since 1928, and continues to promote multidisciplinary scientific dialogue. The potential for further excavation and archaeological research at the site is to date far from exhausted.	Yes: 2014	
9	Italy	Rock Drawings in Valcamonica	<a href="http://whc.unesco.org/en/whl/94">http://whc.unesco.org/en/whl/94</a>	1979	(iii), (vi)	Epipaleolithic - Roman and Mediaeval periods	Valcamonica, situated in the Lombardy plain, has one of the world's greatest collections of prehistoric petroglyphs – more than 140,000 symbols and figures carved in the rock over a period of 8,000 years and depicting themes connected with agriculture, navigation, war and magic.	C		YES: Criterion (iii); The rock drawings of Valcamonica stretch back over the 8 thousand years which precede our present era. It is unnecessary to accent the conspicuously invaluable nature of human renderings which are of so great an antiquity.	Yes: 2006; 2014	2009: Ground transport infrastructure Interpretative and visitation facilities Major linear utilities/ Management systems/ management plan

EUROPE AND NORTH AMERICA												
#	Country	Site Name	WHL link	DOI	Criteria	Chronology	Description	Category	Large sequence	OUV directly related to HEADS	Factors affecting the property according list WHC conservation report	Perioding Reporting Cycle
10	Norway	Rock Art of Alta	<a href="http://whc.unesco.org/en/list/352">http://whc.unesco.org/en/list/352</a>	1985	(iii)	4,200-500 B.C.	This group of petroglyphs in the Alta Fjord, near the Arctic Circle, bears the traces of a settlement dating from c. 4200 to 500 B.C. The thousands of paintings and engravings add to our understanding of the environment and human activities on the fringes of the Far North in prehistoric times.	C		YES, Criterion (iii): The Rock Art of Alta, with its thousands of paintings and engravings, is an exceptional testimony of the aspects of life, the environment and the activities of hunter-gatherer societies in the Arctic in prehistoric times. The wide range of motifs and scenes of high artistic quality reflect a long tradition of hunter-gatherer societies and their interaction with landscape, as well as the evolution of their symbols and rituals from approximately 5000 B.C. to about the year 0.	2004: Deliberate destruction of heritage	Yes: 2006; 2013
11	Norway	Vegavayn – The Vega Archipelago	<a href="https://whc.unesco.org/en/list/1143">https://whc.unesco.org/en/list/1143</a>	2004	(v)	Mesolithic- Stone age	Archaeological evidence suggests that the island of Vega was well populated with marine hunters and fishermen in the early Mesolithic period, and that this settlement persisted through the Stone Age.	C	Yes	No		Yes: 2013
12	Portugal, Spain	Prehistoric Rock Art Sites in the Côa Valley and Siega Verde	<a href="http://whc.unesco.org/en/list/866">http://whc.unesco.org/en/list/866</a>	2010	(i), (iii)	Paleolithic Age	The two Prehistoric Rock Art Sites in the Côa Valley (Portugal) and Siega Verde (Spain) are located on the banks of the rivers Agueda and Côa, tributaries of the river Douro, documenting continuous human occupation from the end of the Paleolithic Age. Hundreds of panels with thousands of animal figures (5,000 in Foz Côa and around 440 in Siega Verde) were carved over several millennia, representing the most remarkable open-air ensemble of Paleolithic art on the Iberian Peninsula.	C		Criterion (i): The rock engravings in Foz Côa and Siega Verde, dating from the Upper Paleolithic to the final Magdalenian/ Epipaleolithic (22,000 – 8,000 BCE), represent a unique example of the first manifestations of human symbolic creation and of the beginnings of cultural development which reciprocally shed light upon one another and constitute an unrivalled source for understanding Paleolithic art.		Yes: 2014
13	Spain	Rock Art of the Mediterranean Basin on the Iberian Peninsula	<a href="http://whc.unesco.org/en/list/874">http://whc.unesco.org/en/list/874</a>	1998	(iii)	Paleolithic Age	The late prehistoric rock-art sites of the Mediterranean seaboard of the Iberian peninsula form an exceptionally large group. Here the way of life during a critical phase of human development is vividly and graphically depicted in paintings whose style and subject matter are unique.	C		Criterion (iii): The corpus of late prehistoric mural paintings in the Mediterranean basin of eastern Spain is the largest group of rock-art sites anywhere in Europe, and provides an exceptional picture of human life in a seminal period of human cultural evolution.		Yes: 2014
14	Spain	Cave of Altamira and Paleolithic Cave Art of Northern Spain	<a href="https://whc.unesco.org/en/list/310">https://whc.unesco.org/en/list/310</a>	1985	(i), (iii)	35,000 BC - 11,000 BC	Seventeen decorated caves of the Paleolithic age were inscribed as an extension to the Altamira Cave, inscribed in 1985. The property will now appear on the List as Cave of Altamira and Paleolithic Cave Art of Northern Spain. The property represents the apogee of Paleolithic cave art that developed across Europe, from the Urals to the Iberian Peninsula, from 35,000 to 11,000 BC. Because of their deep galleries, isolated from external climatic influences, these caves are particularly well preserved. The caves are inscribed as masterpieces of creative genius and as the humanity's earliest accomplished art. They are also inscribed as exceptional testimonies to a cultural tradition and as outstanding illustrations of a significant stage in human history.	C		Criterion (iii): The cave art bears exceptional testimony to the Magdalenian civilizations of southern Europe		Yes: 2006; 2014
15	Spain	Archaeological Site of Atapuerca	<a href="https://whc.unesco.org/en/list/989">https://whc.unesco.org/en/list/989</a>	2000	(iii)(v)	one million BP	The caves of the Sierra de Atapuerca contain a rich fossil record of the earliest human beings in Europe, from nearly one million years ago and extending up to the Common Era. They represent an exceptional reserve of data, the scientific study of which provides priceless information about the appearance and the way of life of these remote human ancestors.	C		Criterion (iii): The earliest and most abundant evidence of humankind in Europe is to be found in the caves of the Sierra de Atapuerca.		Yes: 2014
16	Sweden	Rock Carvings in Tanum	<a href="http://whc.unesco.org/en/list/557">http://whc.unesco.org/en/list/557</a>	1994	(i), (iii), (iv)	Bronze Age	The rock carvings in Tanum, in the north of Bohuslän, are a unique artistic achievement not only for their rich and varied motifs (depictions of humans and animals, weapons, boats and other subjects) but also for their cultural and chronological unity. They reveal the life and beliefs of people in Europe during the Bronze Age and are remarkable for their large numbers and outstanding quality.	C		YES, OUV: The continuity of settlement and consistency in land use in the Tanum area, as illustrated by the rock art, the archaeological remains, and the features of the modern landscape in the Tanum region combine to make this a remarkable example of continuity over eight millennia of human history.	1999: Ground transport infrastructure	Yes: 2006



EUROPE AND NORTH AMERICA												
#	Country	Site Name	WHL link	DOI	Criteria	Chronology	Description	Category	Large sequence	OUV directly related to HEADS	Factors affecting the property according list: WHC conservation report	Periodic Reporting Cycle
17	Turkey	Göbekli Tepe	<a href="https://whc.unesco.org/en/whl/1572">https://whc.unesco.org/en/whl/1572</a>	2018	(i), (ii), (iv)	9600 BC - 8200 BC	Göbekli Tepe is one of the most impressive prehistoric megalithic monuments in the world on account of its great antiquity (10th and 9th millennia BC), the number and sophistication of its limestone megalithic buildings, the shaping of the stones, and the breathtaking imagery found carved and engraved on many of the stones and T-pillars found at the site. Further, the imagery from Göbekli Tepe provides unprecedented insights into the worldview and belief systems of prehistoric populations living in Upper Mesopotamia some 11,500 years ago, a time which corresponds with one of the most momentous transitions in human history, one which took us from hunter-gatherer subsistence to (modern) farming lifeways, also referred to as Neolithisation.	C		Yes, Criterion (ii): Many of the stones and T-pillars found at the property carry carved and engraved imagery. Depictions include many different species of wild animals, birds and insects, as well as human representations, all providing unique insights into the beliefs and worldview of the people in the 10th and 9th millennia BC and at Göbekli Tepe for the first time perpetuated in stone. Criterion (iv): Göbekli Tepe is home to the world's first human-built monumental (megalithic) buildings. In contrast to earlier periods of human history, when images (carvings, paintings etc.) were applied to surfaces in natural environments (caves, rock shelters etc.), at Göbekli Tepe these images were applied to elements within a (planned) built environment, often referred to as the 'world's first temples'.	No	
18	United Kingdom of Great Britain and Northern Ireland	Gorham's Cave Complex	<a href="http://whc.unesco.org/en/whl/1500">http://whc.unesco.org/en/whl/1500</a>	2016	(iii)	27,000 - 30,000 B.P.	The steep limestone cliffs on the eastern side of the Rock of Gibraltar contain four caves with archaeological and paleontological deposits that provide evidence of Neanderthal occupation over a span of more than 100,000 years. This exceptional testimony to the cultural traditions of the Neanderthals is seen notably in evidence of the hunting of birds and marine animals for food, the use of feathers for ornamentation and the presence of abstract rock engravings. Scientific research on these sites has already contributed substantially to debates about Neanderthal and human evolution.	C		YES, Criterion (iii): Gorham's Cave Complex provides an exceptional testimony to the occupation, cultural traditions and material culture of Neanderthal and early modern human populations through a period spanning approximately 120,000 years. This is expressed by the rich archaeological evidence in the caves, the rare rock engravings at Gorham's Caves (dated to more than 39,000 years ago), rare evidence of Neanderthal exploitation of birds and marine animals for food, and the ability of the deposits to depict the climatic and environmental conditions of the peninsula over this vast span of time. The archaeological and scientific potential of the caves continues to be explored through archaeological research and scientific debates, providing continuing opportunities for understanding Neanderthal life, including their capacity for abstract thinking.	No	
19	Canada	Pimachiowin Aki	<a href="https://whc.unesco.org/en/whl/1415">https://whc.unesco.org/en/whl/1415</a>	2018	(iii)(v)(ix)		Pimachiowin Aki ("The Land That Gives Life") is a landscape of rivers, lakes, wetlands, and boreal forest. It forms part of the ancestral home of the Anishinaabeg, an indigenous people living from fishing, hunting and gathering. The site encompasses the traditional lands of four Anishinaabeg communities (Bloodvein River, Little Grand Rapids, Paungassi and Poplar River). The Anishinaabeg are a highly mobile indigenous hunting-gathering-fishing people, who say that they and their indigenous ancestors have made use of this and adjacent landscapes for over 7,000 years.	M		Criterion (iii): Pimachiowin Aki provides an exceptional testimony to the continuing Anishinaabeg cultural tradition of J-ganawendamang Gidakiminaan (Keeping the Land). J-ganawendamang Gidakiminaan guides relations between Anishinaabeg and the land; it is the framework through which the cultural landscape of Pimachiowin Aki is perceived, given meaning, used and sustained across the generations. Widely dispersed across the landscape are ancient and contemporary livelihood sites, sacred sites and named places, most linked by waterways that are tangible reflections of J-ganawendamang Gidakiminaan.	No	
20	Canada	Head-Smashed-in Buffalo Jump	<a href="https://whc.unesco.org/en/whl/158">https://whc.unesco.org/en/whl/158</a>	1981	(vi)	3,600 BC - 19th century	The site was used for the slaughter of bison from 3,600 B.C. to 2,600 B.C., then intermittently toward 900 B.C., and finally, continuously from 200 A.D. to 1850	C		Criterion (vi): Head-Smashed-in Buffalo Jump is one of the oldest, most extensive, and best preserved sites that illustrate communal hunting techniques and the way of life of Plains people who, for more than five millennia, subsisted on the vast herds of bison that existed in North America.	Yes: 2013	
21	United States of America	Grand Canyon National Park	<a href="https://whc.unesco.org/en/whl/75">https://whc.unesco.org/en/whl/75</a>	1979	(vii), (viii), (ix), (x)	2 billion years - Present	Carved out by the Colorado River, the Grand Canyon (nearly 1,500 m deep) is the most spectacular gorge in the world. Located in the State of Arizona, it cuts across the Grand Canyon National Park. Its horizontal strata rerate the geological history of the past 2 billion years. There are also prehistoric traces of human adaptation to a particularly harsh environment. The known human history of the Grand Canyon area stretches back 10,500 years, when the first evidence of human presence in the area is found.	N		2018: Effects arising from use of transportation infrastructure impacts of tourism / visitor / recreation Mining Water infrastructure	Yes: 2013	

LATIN AMERICA AND THE CARRIBEAN												
#	Country	Site Name	WHL link	DOI	Criteria	Chronology	Description	Category	Large sequence	OUV directly related to HEADS	Factors affecting the property according last WHC conservation report	Perioding Reporting Cycle
1	Argentina	Cueva de las Manos, Rio Pinturas	<a href="http://whc.unesco.org/en/list/936">http://whc.unesco.org/en/list/936</a>	1999	(iii)	13,000-9,5000 YA	The Cueva de las Manos, Rio Pinturas, contains an exceptional assemblage of cave art, executed between 13,000 and 9,500 years ago. It takes its name (Cave of the Hands) from the stencilled outlines of human hands in the sand, but there are also many depictions of animals, such as guanacos ( <i>Lama guanicoe</i> ), still commonly found in the region, as well as hunting scenes. The people responsible for the paintings may have been the ancestors of the historic hunter-gatherer communities of Patagonia found by European settlers in the 19th century.	C		YES; Criterion (iii): The Cueva de las Manos contains an outstanding collection of prehistoric rock art which bears witness to the culture of the earliest human societies in South America.		No
2	Argentina	Quebrada de Humahuaca	<a href="https://whc.unesco.org/en/list/1116">https://whc.unesco.org/en/list/1116</a>	2003	(ii)(iv)(v)	9000BC - 20th century	Quebrada de Humahuaca follows the line of a major cultural route, the Camino Inca, along the spectacular valley of the Rio Grande, from its source in the cold high desert plateau of the High-Andean lands to its confluence with the Rio Leone some 150 km to the south. The valley shows substantial evidence of its use as a major trade route over the past 10,000 years. It features visible traces of prehistoric hunter-gatherer communities, of the Inca Empire (15th to 16th centuries) and of the fight for independence in the 19th and 20th centuries.	C	Yes	Prehistoric hunter/gatherer and early farming communities, 9000 BC to 400 AD: The earliest evidence for paths and trackways (some of which are still in use) are associated with the use of caves and cave shelters high up in the mountains. 6 caves, decorated with both petroglyphs and pictographs, contain evidence from beads and arrows for their use as shelters. Associated with the caves are lithic workshops, lower down on the river terraces, where the stone was worked for axes and arrow-heads. 27 workshops have been located.		No
3	Argentina	Ischigualasto / Talampayo National Parks	<a href="http://whc.unesco.org/en/list/966">http://whc.unesco.org/en/list/966</a>	2000	(viii)	Triassic Period (geological)	These two contiguous parks, extending over 275,300 ha in the desert region on the western border of the Sierra Pampeanas of central Argentina, contain the most complete continental fossil record known from the Triassic Period (245-208 million years ago). Six geological formations in the parks contain fossils of a wide range of ancestors of mammals, dinosaurs and plants revealing the evolution of vertebrates and the nature of palaeo-environments in the Triassic Period.	N		YES; OUV: The property is located in an arid region in the rain shadow of the Andes. Further to the significance for research the property has important archaeological values, such as 1500 year-old petroglyphs.		No
4	Brazil	Serra da Capivara National Park	<a href="http://whc.unesco.org/en/list/606">http://whc.unesco.org/en/list/606</a>	1991	(iii)	25,000 YA	Many of the numerous rock shelters in the Serra da Capivara National Park are decorated with cave paintings, some more than 25,000 years old. They are an outstanding testimony to one of the oldest human communities of South America.	C	Yes	YES; Criterion (iii): The Serra da Capivara National Park bears exceptional testimony to one of the oldest populations to inhabit South America. It constitutes and preserves the largest ensemble of archaeological sites, and the the oldest examples of rock art in the Americas. Moreover, the iconography of the paintings allows us to identify information about the region's early peoples.	1994: Illegal activities Management systems/ management plan Other Threats: Fire	No

LATIN AMERICA AND THE CARRIBEAN												
#	Country	Site Name	WHL link	DOI	Criteria	Chronology	Description	Category	Large sequence	OUV directly related to HEADS	Factors affecting the property according last WHC conservation report	Perioding Reporting Cycle
5	Mexico	Tehuacán-Cuicatlan Valley: original habitat of Mesoamerica	<a href="https://whc.unesco.org/en/lisr/l1534">https://whc.unesco.org/en/lisr/l1534</a>	2018	(iv), (x)	12,000 BC - Present	Tehuacán-Cuicatlan Valley, part of the Mesoamerican region, is the arid or semi-arid zone with the richest biodiversity in all of North America. Consisting of three components, Zapotitlan-Cuicatlan, San Juan Raya and Puruon, it is one of the main centres of diversification for the cacti family, which is critically endangered worldwide. The valley harbours the densest forests of columnar cacti in the world, shaping a unique landscape that also includes agaves, yuccas and oaks. Archaeological remains demonstrate technological developments and the early domestication of crops. The valley presents an exceptional water management system of canals, wells, aqueducts and dams, the oldest in the continent, which has allowed for the emergence of agricultural settlements.	M		Yes: Criterion (iv): Archaeological findings provide evidence of man's adaptation in response to a local environment, which extended over 12,000 years, giving rise to the cultural area of Mesoamerica; Tehuacán-Cuicatlan Valley provides evidence to the human advancement towards agriculturalist communities illustrating one of the earliest examples of plant domestication (9500 to 7000 BCE); interaction between man and nature, as well as continuity and cultural legacy, are reflected through the development of pictographic writing and the production of a number of illustrated manuscripts unparalleled on the continent.		No
6	Mexico	Prehistoric Caves of Yagui and Mitla in the Central Valley of Oaxaca	<a href="https://whc.unesco.org/en/lisr/l1352">https://whc.unesco.org/en/lisr/l1352</a>	2010	(iii)	10,000 BC	This property lies on the northern slopes of the Tlacolula valley in subtropical central Oaxaca and consists of two pre-Hispanic archaeological complexes and a series of pre-historic caves and rock shelters. Some of these shelters provide archaeological and rock-art evidence for the progress of nomadic hunter-gatherers to incipient farmers. Ten thousand-year-old Cucurbitaceae seeds in one cave, Guila Naquitz, are considered to be the earliest known evidence of domesticated plants in the continent, while corn cob fragments from the same cave are said to be the earliest documented evidence for the domestication of maize. The cultural landscape of the Prehistoric Caves of Yagui and Mitla demonstrates the link between man and nature that gave origin to the domestication of plants in North America, thus allowing the rise of Mesoamerican civilizations.	C		Yes: Criterion (iii): Some two to three hundred metres above the floor of the valley within volcanic rocks are some 147 caves, rock shelters or open sites, a few of which are seen to have provided archaeological and rock art evidence for hunter-gatherers and their transition to farming		No
7	Colombia	Chiribiquete National Park – "The Maloca of the Jaguar"	<a href="https://whc.unesco.org/en/lisr/l1174">https://whc.unesco.org/en/lisr/l1174</a>	2018	(iii), (ix), (x)	20,000 BC - Present	Located in the north-west Colombian Amazon, Chiribiquete National Park is the largest protected area in the country. One of the defining features of the park is the presence of tepuis (table-top mountains), sheer-sided sandstone plateaux that dominate the forest and result in dramatic scenery that is reinforced by its remoteness and inaccessibility. Over 75,000 paintings, dating from 20,000 BCE to the present day, are to be seen on the walls of the 60 rock shelters around the bases of the tepuis. Believed to be linked to the worship of the jaguar, a symbol of power and fertility, these paintings depict hunting scenes, battles, dances and ceremonies. The indigenous communities, which are not directly present on the site, consider the region sacred.	M		Yes: Criterion (iii): The rock art sites of Chiribiquete hold an exceptional testimony, by the large number of painted rock shelters around the foot of rare tepui rock formations, by the diversity of motifs, which are often realistic, and by the chronological depth and persistence up to the present-day of the purported frequentation of the sites by isolated communities. The first inhabitants of Amazonia practised their art on the rock walls of Chiribiquete, and these paintings constitute an exceptional testimony of their vision of the world. Chiribiquete is even today considered to be of mythical importance by several groups and is designated the "Great Home of the Animals".		No

H-G sites on the Tentative List: Africa					
Country	Site Name	Date of Submission	Criteria	Link	
Burkina Faso	Les gravures rupestres du Sahel burkinabè : Pobé-Mengao, Arbinda et Markoye	24.01.2012	(ii), (iii)	<a href="https://whc.unesco.org/en/tentativelists/5657/">https://whc.unesco.org/en/tentativelists/5657/</a>	
Cameroon	Les Gravures Rupestres de Bidzar	02.02.2018	(i)	<a href="https://whc.unesco.org/en/tentativelists/6322/">https://whc.unesco.org/en/tentativelists/6322/</a>	
Chad	Gravures et peintures rupestres de l'Ennedi et du Tibesti	21.07.2005	(no criteria submitted)	<a href="https://whc.unesco.org/en/tentativelists/2055/">https://whc.unesco.org/en/tentativelists/2055/</a>	
Chad	Site à Hominiés anciens du Djourab	21.07.2005		<a href="https://whc.unesco.org/en/tentativelists/2050/">https://whc.unesco.org/en/tentativelists/2050/</a>	
Central African Republic	Les gravures rupestres de Lengou	11.04.2006	(no criteria submitted)	<a href="https://whc.unesco.org/en/tentativelists/4006/">https://whc.unesco.org/en/tentativelists/4006/</a>	
Ethiopia	Melka Kunture and Bachilt Archaeological Site	27.12.2012	(iii)(iv)(v)	<a href="https://whc.unesco.org/en/tentativelists/5788/">https://whc.unesco.org/en/tentativelists/5788/</a>	
Mali	Es-Souk	08.09.1999	(ii), (iv)	<a href="https://whc.unesco.org/en/tentativelists/1349/">https://whc.unesco.org/en/tentativelists/1349/</a>	
Mozambique	Vumba Mountain Range	20.08.2008	(iii), (vi)	<a href="https://whc.unesco.org/en/tentativelists/5381/">https://whc.unesco.org/en/tentativelists/5381/</a>	
Namibia	Brandberg National Monument Area	03.10.2002	(no criteria submitted)	<a href="https://whc.unesco.org/en/tentativelists/1744/">https://whc.unesco.org/en/tentativelists/1744/</a>	
Namibia	São Living Cultural Landscape	18.03.2016	(v), (vi)	<a href="https://whc.unesco.org/en/tentativelists/6096/">https://whc.unesco.org/en/tentativelists/6096/</a>	

H-G sites on the Tentative List: Africa						
Country	Site Name	Date of Submission	Criteria	Link		
Niger	Itinéraires Culturels du Désert du Sahara : Route du sel	26.05.2006	(no criteria submitted)	<a href="https://whc.unesco.org/en/tentativelists/5043/">https://whc.unesco.org/en/tentativelists/5043/</a>		
Niger	Le fleuve Niger, les îles et la vallée	26.05.2006	(vii), (ix)	<a href="https://whc.unesco.org/en/tentativelists/5053/">https://whc.unesco.org/en/tentativelists/5053/</a>		
Niger	Plateau et Fortin du Djado	26.05.2006	(i), (iii)	<a href="https://whc.unesco.org/en/tentativelists/5044/">https://whc.unesco.org/en/tentativelists/5044/</a>		
South Africa	The Emergence of Modern Humans: The Pleistocene occupation sites of South Africa	15.04.2015	(ii)(iii)(iv)(v)(vi)	<a href="https://whc.unesco.org/en/tentativelists/6050/">https://whc.unesco.org/en/tentativelists/6050/</a>		
Uganda	Nyero and other hunter-gatherer geometric rock art sites in eastern Uganda	10.09.1997	(i)(ii)(vi)	<a href="https://whc.unesco.org/en/tentativelists/914/">https://whc.unesco.org/en/tentativelists/914/</a>		
Zambia	Mwela Rock Paintings	10.03.2009	(iii), (v), (vi)	<a href="https://whc.unesco.org/en/tentativelists/5425/">https://whc.unesco.org/en/tentativelists/5425/</a>		
Zimbabwe	Ziwa National Monument	26.06.1997	(iii), (iv), (v)	<a href="https://whc.unesco.org/en/tentativelists/903/">https://whc.unesco.org/en/tentativelists/903/</a>		
Democratic Republic of the Congo	Grottes de Dimba et Ngovo	11.11.1997		<a href="https://whc.unesco.org/en/tentativelists/961/">https://whc.unesco.org/en/tentativelists/961/</a>		
Democratic Republic of the Congo	Grottes de Matupi	11.11.1997		<a href="https://whc.unesco.org/en/tentativelists/962/">https://whc.unesco.org/en/tentativelists/962/</a>		

H-G sites on the Tentative List: Africa						
Country	Site Name	Date of Submission	Criteria	Link		
Djibouti	Les Gravures Rupestre d'Abourma	05.01.2015	(i)(iii)	<a href="https://whc.unesco.org/en/tentativelists/5957/">https://whc.unesco.org/en/tentativelists/5957/</a>		
Botswana	Tswapong Hills Cultural Landscape	27.05.2010	(v)(vi)	<a href="https://whc.unesco.org/en/tentativelists/5560/">https://whc.unesco.org/en/tentativelists/5560/</a>		
Botswana	Gwihaba Caves	27.05.2010	(vii)(viii)	<a href="https://whc.unesco.org/en/tentativelists/5558/">https://whc.unesco.org/en/tentativelists/5558/</a>		
Kenya	The African Great Rift Valley - Olorgesalie Prehistoric Site	12.02.2010	(iii)(viii)	<a href="https://whc.unesco.org/en/tentativelists/5505/">https://whc.unesco.org/en/tentativelists/5505/</a>		
Lesotho	Thaba-Bosiu National Monument	08.10.2008	(iii)(v)	<a href="https://whc.unesco.org/en/tentativelists/5392/">https://whc.unesco.org/en/tentativelists/5392/</a>		

**H-G sites on the Tentative List: Arab States**

Country	Site Name	Date of Submission	Criteria	Link
Morocco	Aire du Dragonnier Ajgal	12.10.1998	(vii), (viii), (ix), (x)	<a href="https://whc.unesco.org/en/tentativelists/1180/">https://whc.unesco.org/en/tentativelists/1180/</a>
Morocco	Oasis de Figuig	30.05.2011	(iii), (iv), (v)	<a href="https://whc.unesco.org/en/tentativelists/5625/">https://whc.unesco.org/en/tentativelists/5625/</a>
Tunisia	Parc National d'El Feija	28.05.2008	(vii), (viii), (x)	<a href="https://whc.unesco.org/en/tentativelists/5383/">https://whc.unesco.org/en/tentativelists/5383/</a>
Egypt	Mountain Chains	12.06.2003	(vii), (viii), (ix), (x)	<a href="https://whc.unesco.org/en/tentativelists/1811/">https://whc.unesco.org/en/tentativelists/1811/</a>
Iraq	Bestansur Neolithic settlement	20.01.2017	(iii), (iv)	<a href="https://whc.unesco.org/en/tentativelists/6172/">https://whc.unesco.org/en/tentativelists/6172/</a>
Saudi Arabia	Dūmat Al-Jandal Historical Oasis in Al- Jawf Region	08.04.2015	(ii), (iv)	<a href="https://whc.unesco.org/en/tentativelists/6034/">https://whc.unesco.org/en/tentativelists/6034/</a>
Saudi Arabia	Hima a rock art site in Najran	08.04.2015	(i), (iii), (v)	<a href="https://whc.unesco.org/en/tentativelists/6033/">https://whc.unesco.org/en/tentativelists/6033/</a>

**H-G sites on the Tentative List: Asia and the Pacific**

Country	Site Name	Date of Submission	Criteria	Link
Philippines	Petroglyphs and Petrographs of the Philippines	16.05.2006	(iii)	<a href="https://whc.unesco.org/en/tentativelists/5018/">https://whc.unesco.org/en/tentativelists/5018/</a>
Philippines	Paleolithic Archaeological Sites in Cagayan Valley	16.05.2006	(ii)(iii)(iv)(v)	<a href="https://whc.unesco.org/en/tentativelists/2069/">https://whc.unesco.org/en/tentativelists/2069/</a>
Philippines	The Tabon Cave Complex and all of Lipuun	16.05.2006	(ii)(iii)(iv)(v)	<a href="https://whc.unesco.org/en/tentativelists/1860/">https://whc.unesco.org/en/tentativelists/1860/</a>
Australia	Budj Bim Cultural Landscape	20.01.2017	(iii), (iv), (v)	<a href="https://whc.unesco.org/en/tentativelists/6167/">https://whc.unesco.org/en/tentativelists/6167/</a>
Republic of Korea	Daegokcheon Stream Petroglyphs	11.01.2010	(iii)	<a href="https://whc.unesco.org/en/tentativelists/5486/">https://whc.unesco.org/en/tentativelists/5486/</a>
Indonesia	Prehistoric Cave Sites in Maros-Pangkep	06.10.2009	(ix)	<a href="https://whc.unesco.org/en/tentativelists/5467/">https://whc.unesco.org/en/tentativelists/5467/</a>
China	Yangtze Gorges Scenic Spot	29.11.2001		<a href="https://whc.unesco.org/en/tentativelists/1623/">https://whc.unesco.org/en/tentativelists/1623/</a>
Papua New Guinea	Huon Terraces - Stairway to the Past	06.06.2006	(iii)(v)(vii)(viii)(ix)(x)	<a href="https://whc.unesco.org/en/tentativelists/5066/">https://whc.unesco.org/en/tentativelists/5066/</a>



H-G sites on the Tentative List: Asia and the Pacific						
Country	Site Name	Date of Submission	Criteria	Link		
Viet Nam	Con Moong Cave	21.06.2006		<a href="https://whc.unesco.org/en/tentativelists/5072/">https://whc.unesco.org/en/tentativelists/5072/</a>		
Kazakhstan	Paleolithic sites and geomorphology of Karatau mountain range	24.09.1998		<a href="https://whc.unesco.org/en/tentativelists/1136/">https://whc.unesco.org/en/tentativelists/1136/</a>		
Kyrgyzstan	Saimaly-Tash Petroglyphs	29.01.2001	(iii)(iv)(vi)	<a href="https://whc.unesco.org/en/tentativelists/1512/">https://whc.unesco.org/en/tentativelists/1512/</a>		
Uzbekistan	Zarautsoy Rock Paintings	18.01.2008	(i)(ii)(iii)	<a href="https://whc.unesco.org/en/tentativelists/5299/">https://whc.unesco.org/en/tentativelists/5299/</a>		
Uzbekistan	Siypantosh Rock Paintings	18.01.2008	(ii)(iii)	<a href="https://whc.unesco.org/en/tentativelists/5299/">https://whc.unesco.org/en/tentativelists/5299/</a>		
Uzbekistan	Sarmishsay	18.01.2008	(vi)(ix)	<a href="https://whc.unesco.org/en/tentativelists/5307/">https://whc.unesco.org/en/tentativelists/5307/</a>		
Iran	Natural-Historical Complex / Cave of Karaftoo	02.02.2017	(ii)(iii)(iv)(v)(vii)(x)	<a href="https://whc.unesco.org/en/tentativelists/6193/">https://whc.unesco.org/en/tentativelists/6193/</a>		

H-G sites on the Tentative List: Europe and North America					
Country	Site Name	Date of Submission	Criteria	Link	
Bulgaria	The Magoura cave with drawings from the bronze age	01.10.1984	(i), (iii)	<a href="https://whc.unesco.org/en/tentativelists/45/">https://whc.unesco.org/en/tentativelists/45/</a>	
Bulgaria	Rocks of Belogradchik	10.10.2011	(vii)(viii)	<a href="https://whc.unesco.org/en/tentativelists/5640/">https://whc.unesco.org/en/tentativelists/5640/</a>	
Canada	Writing-on-Stone / Áísínai'pi	01.10.2014	(i)(iii)(iv)(vi)	<a href="https://whc.unesco.org/en/tentativelists/6254/">https://whc.unesco.org/en/tentativelists/6254/</a>	
Israel	Mount Karkom	30.06.2000	(iii), (v)	<a href="https://whc.unesco.org/en/tentativelists/1488/">https://whc.unesco.org/en/tentativelists/1488/</a>	
Romania	L'ensemble rupestre de Basarabi	01.03.1991	(no criteria submitted)	<a href="https://whc.unesco.org/en/tentativelists/549/">https://whc.unesco.org/en/tentativelists/549/</a>	
Russian Federation	Petroglyphs of Sikachi-Alyan	31.01.2003	(no criteria submitted)	<a href="https://whc.unesco.org/en/tentativelists/1787/">https://whc.unesco.org/en/tentativelists/1787/</a>	
Russian Federation	Rock Painting of Shulgan-Tash Cave	14.03.2018	(i), (iii)	<a href="https://whc.unesco.org/en/tentativelists/6309/">https://whc.unesco.org/en/tentativelists/6309/</a>	
Italy	Karstic caves in prehistoric Apulia	01.06.2006	(i)(ii)(iii)	<a href="https://whc.unesco.org/en/tentativelists/5011/">https://whc.unesco.org/en/tentativelists/5011/</a>	
Republic of Moldova	Orheiul Vechi Archaeological Landscape	22.02.2017	(ii)(v)	<a href="https://whc.unesco.org/en/tentativelists/6220/">https://whc.unesco.org/en/tentativelists/6220/</a>	

H-G sites on the Tentative List: Europe and North America					
Country	Site Name	Date of Submission	Criteria	Link	
Finland	The large Stone Age ruin of Kastelli at Pattijoki	01.10.1990	(i)(iv)	<a href="https://whc.unesco.org/en/tentativelists/219/">https://whc.unesco.org/en/tentativelists/219/</a>	
Finland	The Rock paintings of Astuvansalmi at Ristiina	01.10.1990	(i)(iv)	<a href="https://whc.unesco.org/en/tentativelists/220/">https://whc.unesco.org/en/tentativelists/220/</a>	
Poland	"Krzemionki", prehistoric flint mines	12.01.2016	(i)(iii)(iv)(v)	<a href="https://whc.unesco.org/en/tentativelists/6075/">https://whc.unesco.org/en/tentativelists/6075/</a>	
Turkey	Karain Cave	01.02.1994	(iii)(vi)	<a href="https://whc.unesco.org/en/tentativelists/666/">https://whc.unesco.org/en/tentativelists/666/</a>	
Ukraine	Archaeological Site "Stone Tomb"	11.08.2006	(iii)(vi)	<a href="https://whc.unesco.org/en/tentativelists/5075/">https://whc.unesco.org/en/tentativelists/5075/</a>	

H-G sites on the Tentative List: Latin America and the Caribbean					
Country	Site Name	Date of Submission	Criteria	Link	
Brazil	Canyon du Rio Peruaçu, Minas Gerais	11.03.1998	(vii)(viii)(ix)(x)	<a href="https://whc.unesco.org/en/tentativelists/969/">https://whc.unesco.org/en/tentativelists/969/</a>	
Brazil	Cavernas do Peruaçu Federal Environmental Protection Area (APA) / Veredas Do Peruaçu State Park	16.09.1998	(iii)(iv)(v)(vii)(viii)(ix)(x)	<a href="https://whc.unesco.org/en/tentativelists/1124/">https://whc.unesco.org/en/tentativelists/1124/</a>	
Chile	Rupestrian art of the Patagonia	01.09.1998	(i) (ii) (iii)	<a href="https://whc.unesco.org/en/tentativelists/1203/">https://whc.unesco.org/en/tentativelists/1203/</a>	
Mexico	Vallée des Cierges	06.12.2004	(no criteria submitted)	<a href="https://whc.unesco.org/en/tentativelists/1953/">https://whc.unesco.org/en/tentativelists/1953/</a>	
Paraguay	Parque Nacional Ybyturuzu	05.10.1993	(no criteria submitted)	<a href="https://whc.unesco.org/en/tentativelists/507/">https://whc.unesco.org/en/tentativelists/507/</a>	
Uruguay	Chamangá: A Rock Paintings Area	24.02.2005	(iii)	<a href="https://whc.unesco.org/en/tentativelists/2033/">https://whc.unesco.org/en/tentativelists/2033/</a>	

H-G sites on the Tentative List: Latin America and the Caribbean					
Country	Site Name	Date of Submission	Criteria	Link	
República Dominicana	Arte Rupestre Prehispanico en República Dominicana	05.02.2018	(i)(iii)	<a href="https://whc.unesco.org/en/tentativelists/6294/">https://whc.unesco.org/en/tentativelists/6294/</a>	
Guatemala	The Caves of Naj Tunich	27.04.2012	(i)(iii)(v)(vi)(vii)	<a href="https://whc.unesco.org/en/tentativelists/5739/">https://whc.unesco.org/en/tentativelists/5739/</a>	
Argentina	Cueva de las Manos and associated sites of the Pinturas river basin	31.01.2018	(iii)	<a href="https://whc.unesco.org/en/tentativelists/6297/">https://whc.unesco.org/en/tentativelists/6297/</a>	

## Annex II

### International Standards setting texts and codes of practice

Chart of Athens 1931

<http://www.icomoscr.org/doc/teoria/VARIOS.1931.carta.atenas.restauracion.monumentos.historicos.pdf>

#### FULL UNESCO LIST OF REFERENCES CONSERVATION CONVENTIONS, CHARTERS AND GUIDELINES UNESCO

[http://portal.unesco.org/en/ev.php-URL\\_ID=23772&URL\\_DO=DO\\_TOPIC&URL\\_SECTION=201.html](http://portal.unesco.org/en/ev.php-URL_ID=23772&URL_DO=DO_TOPIC&URL_SECTION=201.html)

[http://portal.unesco.org/en/ev.php-URL\\_ID=12025&URL\\_DO=DO\\_TOPIC&URL\\_SECTION=471.html](http://portal.unesco.org/en/ev.php-URL_ID=12025&URL_DO=DO_TOPIC&URL_SECTION=471.html)

Selection:

Convention for the Protection of Cultural Property in the Event of Armed Conflict with Regulations for the Execution of the Convention 1954. The Hague, 14 May 1954, [- First Protocol](#), The Hague, 14 May 1954  
[, Second Protocol](#), The Hague, 26 March 1999

[http://portal.unesco.org/en/ev.php-URL\\_ID=13147&URL\\_DO=DO\\_TOPIC&URL\\_SECTION=201.html](http://portal.unesco.org/en/ev.php-URL_ID=13147&URL_DO=DO_TOPIC&URL_SECTION=201.html)

Recommendation on International Principles Applicable to Archaeological Excavations, 5 December 1956

[http://portal.unesco.org/en/ev.php-URL\\_ID=13062&URL\\_DO=DO\\_TOPIC&URL\\_SECTION=201.html](http://portal.unesco.org/en/ev.php-URL_ID=13062&URL_DO=DO_TOPIC&URL_SECTION=201.html)

Recommendation concerning the Safeguarding of Beauty and Character of Landscapes and Sites, 11 December 1962

[http://portal.unesco.org/en/ev.php-URL\\_ID=13067&URL\\_DO=DO\\_TOPIC&URL\\_SECTION=201.html](http://portal.unesco.org/en/ev.php-URL_ID=13067&URL_DO=DO_TOPIC&URL_SECTION=201.html)

Recommendation on the Means of Prohibiting and Preventing the Illicit Export, Import and Transfer of Ownership of Cultural Property, 19 November 1964

[http://portal.unesco.org/en/ev.php-URL\\_ID=13083&URL\\_DO=DO\\_TOPIC&URL\\_SECTION=201.html](http://portal.unesco.org/en/ev.php-URL_ID=13083&URL_DO=DO_TOPIC&URL_SECTION=201.html)

Recommendation concerning the Preservation of Cultural Property Endangered by Public or Private works (UNESCO, 1968)

[http://portal.unesco.org/en/ev.php-URL\\_ID=13133&URL\\_DO=DO\\_TOPIC&URL\\_SECTION=201.html](http://portal.unesco.org/en/ev.php-URL_ID=13133&URL_DO=DO_TOPIC&URL_SECTION=201.html)

Convention on the Means of Prohibiting and Preventing the Illicit Import, Export and Transfer of Ownership of Cultural Property (UNESCO, 1970)

[http://portal.unesco.org/en/ev.php-URL\\_ID=13039&URL\\_DO=DO\\_TOPIC&URL\\_SECTION=201.html](http://portal.unesco.org/en/ev.php-URL_ID=13039&URL_DO=DO_TOPIC&URL_SECTION=201.html)

[http://portal.unesco.org/en/ev.php-URL\\_ID=13178&URL\\_DO=DO\\_TOPIC&URL\\_SECTION=201.html](http://portal.unesco.org/en/ev.php-URL_ID=13178&URL_DO=DO_TOPIC&URL_SECTION=201.html)

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16 November 1972

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# UNESCO, Place of Anthropology in

NURIA SANZ  
UNESCO, France

The United Nations was created in 1945 in response to the devastating consequences of World Wars I and II with the aim of preventing new conflict between nations. This new organization required specific bodies that would be responsible for dealing with potential threats of conflict. As a result, the General Assembly, the Security Council, the Economic and Social Council, the Trusteeship Council, the International Court of Justice, and the Secretariat were set up. Since the 1921 Washington Conference, many national delegations had requested the establishment of specialized agencies to respond to particular needs. In 1945, at the International Conference on Education held in London, the Mexican and American delegations requested the creation of an intellectual body, of ideas that could put into place a real culture of peace, to “build peace in the minds of men,” to respect the “fruitful diversity of the cultures,” to “promote the free flow of ideas,” and to drive “the intellectual and moral solidarity of humankind.” This was how the United Nations Educational, Scientific and Cultural Organization (UNESCO) came into being on November 16, 1945 (UNESCO, n.d. a).

Anthropology has always been present in the work that UNESCO carries out. At the 1945 London Conference there was reflection on a new humanism on which a culture of international peace could be built. UNESCO has worked tirelessly since its foundation to develop a form of international anthropology of public service in the interests of mutual respect between all cultures across the world. At the end of the 1950s a Swiss anthropologist, Alfred Métraux, urgently advocated the development of anthropology in the organization, and its Social Science Committee began to receive input from people such as Claude Lévi-Strauss (UNESCO n.d. b). The discipline was being invited to collaborate in the attempt to overcome the antinomy between the uniqueness of the human condition and the plurality of forms in which it is manifested. For more than seven decades, a body of anthropological experience has been shaped and drawn on by the academic community and has informed multilateral policy.

It is necessary to return to the foundational texts of multilateral organizations, especially UNESCO's, in order to understand the significance that culture acquired after World War II. Historically, but increasingly since the 1940s, Western hegemonies have been confronted by diverse non-Western presences. This has given rise to a need to find new forms of agreement where the West has to consider cooperation in more horizontal terms. The 1945 San Francisco Conference, which established the United Nations, and the London Conference, which brought UNESCO into being, began by defining the future of cultural cooperation. Three years later, the adoption of the Human Rights Charter tested the horizontality of European formulations on contemporary cultural

diversity; it constituted an analytical laboratory for a sort of political ethnography of cultural rights. The proposition of universal rights implied a globally shared basis of rights and duties that was still unexplored, incomplete, and far from being applied worldwide. Articulating such a doctrine and bringing it into practice would require missions, explorations, and fieldwork of an anthropological kind to demonstrate in depth the diversity of non-European cultural practices. Multilateralism in the treatment of universal rights required negotiating with culturally different positions and addressing conceptual and linguistic distances urgently, in order to achieve a text that would provide the commitments to global cooperation that regular politics was not able to secure. Furthermore, freedom of expression was understood as an inherent right of societies, since UNESCO's founding charter established that the organization was brought into being to exercise a form of intellectual solidarity with all peoples across the world, a spirit of responsibility for diversity, and the possibility of freely investigating the objective truth, as well as to ensure the preservation of basic sources of information to produce accurate and objective knowledge.

From the beginning, UNESCO member states appreciated the notion of cultural diversity where all the world's peoples are recognized. UNESCO must "guarantee its Member States the independence, integrity and fruitful diversity of cultures," says its Constitution (UNESCO 1945). The principles of "knowledge" and "knowledge exchange" as means of understanding and respecting peoples led the organization, in its early years, to foster several cultural cooperation programs in which "cultural diversity" was central. It is interesting to return to the statement of Julian Sorell Huxley, UNESCO's first director general, in his initial report:

A second principle of work, which is of great importance, defines UNESCO's attitude and defines the diversity of cultures in the world. On one hand, we must not simply see this variety, but we must also welcome it, because it helps to increase creative and artistic enjoyment opportunities. Also, we must not try to impose a standardized form of culture; quite the opposite, we must encourage each region and each country to freely develop its distinct and original forms of culture. On the other hand, clearly we must not allow this diversity to become a source of incomprehension and, even less, conflict between nations. Hence, we must strive to make all peoples understand other civilizations' trends and products, and we must not aim to confuse or orchestrate different cultures to lead to uniformity. We must strive for unity in diversity, so that other human beings are not imprisoned in their separate cultures but can share the treasures of a unique universal and varied culture. (UNESCO 1946)

Initially, the notion of culture at UNESCO centered more on "artistic" creation and included the organization's work in the area of philosophy. In his 1947 report the director general gives the following definition of culture: "Culture ... includes literature, philosophy, museums, art history, theatre, linguistics, painting and archaeology" (UNESCO 1947a). These fields of knowledge were articulated around key issues, such as the reconstruction of cultural institutions and institutions for the protection of local heritage (libraries, museums, reconstitution of collections) and the development and strengthening of capacities. A survey was carried out on "the condition of art and the artist in the world" and on "art funding by governments," and another on the role of art in education and the exchange of knowledge. Several institutions were created

that aimed at cultural cooperation (the International Council of Museums and the International Theatre Institute, for instance). Lastly, the basis for a Universal Copyright Convention was defined. A year later, in 1948, the first international agreement on culture was signed: the “Agreement for Facilitating the International Circulation of Visual and Auditory Materials of an Educational, Scientific and Cultural Character” (UNESCO 1948a).

The relationship between UNESCO and anthropology is not limited to a common interest in the notion of culture. During the first session of the UNESCO General Conference, held in Paris from 20 November to 10 December 1946, this confluence was also shown in the topics of debate that dealt with a relaunched humanism (UNESCO 1947b). Related subjects were distributed between different sectors and commissions within the new international agency. Education and the press made up sectors, while a separate sector was initially dedicated to libraries, museums, and publications. Another sector was dedicated to the natural sciences, while a further category sought to group together concerns of the social sciences, another philosophy and the humanities. An additional group was dedicated to the arts. The General Conference found it difficult, however, to adapt and clarify disciplinary content to deal with the humanities. From the start, it was thought that philosophy would remain separate and would remain in the cultural sphere rather than in science. It was the director general, Julian Huxley, who proposed separating the social sciences from philosophy and the humanities. The member countries accepted this change.

The development of the social sciences was regarded as a contribution to peace and, for this reason, social science found itself at the crux of UNESCO’s mandate and was accorded particular importance. Three major pillars underpinned the exercise: the development of social science, the application of social science to human relationships, and the achievement of international progress in these aspects. There were, however, differences of perspective. The US delegate confirmed the importance of the social science sector because it allowed analysis and study of the main obstacles to international understanding. In this regard, it was understood that UNESCO should stimulate the creation of institutions and other research centers and provide technical assistance to these organizations. It should also dedicate itself to tackle the forces of nationalism and hostility between states, and the failure of governments to solve problems related to population movement and international relationships of dependence. The French delegate disagreed with this and proposed a more comprehensive debate. He suggested a meeting with the most prominent thinkers from all countries and that a survey be carried out on “several civilizations” in order to avoid exclusions when the General Conference came to work with the idea of world civilization.

In order to define anthropology as an academic discipline that acts within this multilateral organization, it is necessary to highlight four essential processes: human rights; cultural heritage; the question of race; and the right to participate in cultural life.

## Human rights

An international conference was organized in 1945 to define the principles of the Universal Declaration of Human Rights, which was in the process of being created. Between January and May 1947, the Committee on the Philosophical Principles of Human Rights sent a survey to experts across the world to contribute to defining the principles of human rights. On March 27, a Memorandum of Human Rights was drawn up as a preparatory document and the baseline survey was sent to experts from all member states so that they could make their contributions. A month later, in June 1947, the Comité sur les Principes Philosophiques des Droits de l'Homme – Part II (Committee on the Philosophical Principles of Human Rights – Part II) was established and elaborated a document that explained the entire clarification process, summarized in a document entitled “A Collective Approach to the Problems of Human Rights” (UNESCO 1947–52). Melville Herskovits (anthropologist), Jacques Maritain (philosopher), and Peter Skov (former head of the League of Nations’ Minorities Section) submitted their contributions. Between June 26 and July 2, the Committee of Experts on the Philosophical Principles of Human Rights held a meeting in Paris and on July 31 finalized the “Report of the Meeting of the Committee of Experts convened by UNESCO on the Philosophical Principles of the Human Rights.” This document was sent to the Human Rights Commission in New York.

On December 10, 1948, the UN National General Assembly in Paris adopted the Universal Declaration of Human Rights. In 1950 UNESCO published *Les droits de l'esprit: Six études sur les aspects culturels de la Déclaration Universelle des Droits de l'homme réunis par l'UNESCO* (Rights of the Spirit: Six Studies on the Cultural Aspects of the UNESCO Universal Declaration of Human Rights) (UNESCO 1950). The discussion on human rights continued and in 1969 a meeting of experts on cultural rights as human rights was held. Kiyotaka Aoyagi, Fernando Debesal, V. Mahvenieradze, Tomo Martelano, B. Breytenbach, Nicholas C. Otieno, Romesh Thapar, Yehudi A. Cohen, Carlo Argan, George Laming, B. Boutros-Ghali, and Alassane N'Daw were among participants in the meeting. It was here that the definition of cultural rights, of majorities and minorities, of individuals and collectivities, was conceived. It constituted one of the fundamental contributions to the International Covenant on Economic, Social and Cultural Rights, adopted and opened for signature, ratification, and accession by the General Assembly Resolution 2200A (XXI) on December 16, 1966. The covenant entered into force on January 3, 1976.

Expert anthropologists had stated their skepticism about accommodating cultural relativism and its incorporation into an all-encompassing statement. Perhaps that is why, in order to appease the less satisfied, it was requested that work be carried out on the role of philosophy and human sciences in the long-term UNESCO plan, with the aim of conducting a survey on the relationships between cultures.

## Cultural heritages

Work started on the Enquiry into the Interrelations of Cultures in 1948 (UNESCO 1948b). The first report was presented in 1949 and submitted to the Committee of Experts for the Comparative Study of Culture on October 21. As a result of the survey, a meeting of experts was organized for the comparative study of culture. The statement of the enquiry included a resolution requesting an inventory of the cultural heritages of different cultures in order to protect these heritages (UNESCO 1949a). At the same time, on the basis of the Report of the Meeting of the Editorial and Publication Committee of the Philosophic Principles of Human Rights, on September 22, the International Council for Philosophy and Humanistic Studies was established.

## The question of race

Following a meeting in December 1949, the Committee of Experts on Questions of Race prepared a base document for reflection on race (UNESCO 1949b). Several aspects of race were defined, including international policy; race and biology and ethnology; race and social matters; and the cultural contribution of the different races of humanity. This was a fundamental document, central to the task of preparing the Statement on Race, which was published in July 1950. The Statement on Race affirms:

Historical and sociological studies support the view that genetic differences are not of importance in determining the social and cultural differences between different groups of *homo sapiens*, and that the social and cultural changes in different groups have, in the main, been independent of changes in inborn constitution. Vast social changes have occurred which were not in any way connected with changes in racial type. (UNESCO 1969)

On November 28, Claude Lévi-Strauss had been contacted and asked to participate. Following several meetings, on January 24, 1950, the Report of the Committee of Experts Responsible for Preparing the Plan of the Scientific and Cultural History of Humankind was adopted. Lévi-Strauss's books *Race and History* (Lévi-Strauss 1952) and *Race and Culture* (Lévi-Strauss 1971) subsequently became turning points in defining the multi-lateral foundations of cultural diversity's safeguards.

## The right to participate in cultural life

The foundational document "Study of the Right to Participate in Cultural Life" described the philosophical and legal principles for the application of the human right to participate in the cultural life of communities (UNESCO 1952a). Lévi-Strauss and the American Anthropological Association were invited to participate. The report of the Committee of Experts on the Right to Participate in Cultural Life was published in November (UNESCO 1952b).

These four processes established the basis on which the international community has worked to attain, adopt, and ratify the organization's six most significant cultural conventions: the Convention for the Protection of Cultural Property in the Event of Armed Conflict, 1954; Convention on the Means of Prohibiting and Preventing the Illicit Import, Export and Transfer of Ownership of Cultural Property, 1970 (UNESCO 1970); the Convention concerning the Protection of the World Cultural and Natural Heritage, 1972 (UNESCO 1972); the Convention on the Protection of the Underwater Cultural Heritage, 2001; the Convention for Safeguarding of Intangible Cultural Heritage, 2003 (UNESCO 2003); and the Convention on the Protection and Promotion of the Diversity of Cultural Expressions, 2005.

On UNESCO's sixtieth anniversary, on 16 November 2005, UNESCO states parties enjoyed a diplomatic victory that allowed them to open the Convention on the Protection and Promotion of the Diversity of Cultural Expressions to ratification, thus freeing the cultural expressions from the commercial rules of the international market. The then director general of UNESCO, Kōichirō Matsuura, wanted to bring all his predecessors together with Lévi-Strauss, on the day the anthropologist turned ninety-eight. In the solemn setting of the room at UNESCO headquarters in Paris, Lévi-Strauss stated:

To overcome the apparent antinomy between the uniqueness of the human condition and the inexhaustible plurality of forms in which we apprehend it is the essential aim of anthropology. Since its inception as one of UNESCO's concerns, it has grown in importance. The recognition of cultural diversity and the protection of cultural identities are the second part of UNESCO's aim to recognize the importance of anthropology. (UNESCO 2005, 32)

Diversity and respect are anthropology's *raison d'être*. Lévi-Strauss's 1952 text *Race and History*, published in the first issue of the *UNESCO Courier*, is the cornerstone in the struggle against the idea of racial inequality and therefore against the reasoning that helps perpetuate inequality between societies and impedes them from making equal contributions to the common heritage of humanity. Lévi-Strauss concluded that the efforts of science should not only enable humans to exceed themselves but also to help those who are falling behind. He recommended bringing together methodologies of scientific and cultural thought in order to understand that any speculation about the world and life goes beyond the physical. Stressing that disciplines were constituted independently so as to deepen understanding and practice, he also stated that, to endure, they need to engage with one another.

Lévi-Strauss made the most of the opportunity to continue justifying the role of anthropology within the organization. Contending that the Western world could no longer be conceived as universal, he argued for a need to relativize ways of thinking and practicing anthropology from a profound critique of the legacy of ethnocentrism. He reiterated the challenge to preserve the remote pasts of ancestral peoples who lacked written languages, which can only be done piecemeal and with great effort. Without this testimony, understanding what we really are is impossible.

SEE ALSO: American Anthropological Association (AAA); Biocultural Diversity; Cultural Politics; Cultural Resource Management; Cultural Survival; Culture, Concept

of; Diplomacy and International Relations; Endangered Cultures and Languages, Documentation of; Fernandes, Florestan (1920–95); France, Anthropology in; Freyre, Gilberto (1900–1987); Global Governance; González, Alberto Rex (1918–2012); Heritage; Human Rights; Indigeneity in Anthropology; Indigenous Peoples and Higher Education; Intellectual Property; International Organizations, Anthropology of; International Union of Anthropological and Ethnological Sciences (IUAES); Lévi-Strauss, Claude (1908–2009); Museum Conservation; Museum Experiments; Nongovernmental Organizations; Pan-African Anthropological Association (PAAA); Policy, Anthropology and; Race and Racisms; Ramos, Arthur (1903–49); Royal Anthropological Institute (RAI)

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**Sanz, N. 2018.** Transnational Serial Nomination of European Neanderthal Sites for the UNESCO World Heritage List.

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# ONGOING PROJECT: TRANSNATIONAL SERIAL NOMINATION OF EUROPEAN NEANDERTHAL SITES FOR THE UNESCO WORLD HERITAGE LIST. PRELIMINARY REFLECTIONS

Author: Nuria Sanz, Director and Representative of UNESCO in Mexico, General Coordinator of HEADS Programme, UNESCO Focal Point on Rock Art

More than a thousand sites in 167 countries are already inscribed on the UNESCO World Heritage list, yet only a handful of them are sites where human fossils were discovered from the Ice Age. In general, the cultural heritage of the Ice Age and early human history before the rise of urban communities have a very low visibility: in these ice age sites, no spectacular architecture rises into the sky, no impressive walls surround the area, but instead, a cave or the unspectacular surface of a small open-air site characterizes the place. However, the scientific significance of the finds that were made there can often be immense. Milestones of human development that had global consequences become tangible in many of those places. The HEADS program of UNESCO World Heritage (Human Evolution: Adaptations, Dispersals and Social Developments) has been able to convincingly document the extraordinary value and contribution of the early history of mankind to the current World Heritage. The program aims to do justice to the significance of these sites and the outstanding finds that were discovered there, as they often document landmarks of human development history with global consequences.

## A collective vision of Neanderthals: prospect for International Cooperation

Neanderthal sites are of particular importance for the HEADS endeavor, starting with the discovery made in 1856 in the world-famous Feldhofer cave in the Neanderthal Valley near Düsseldorf, Germany. Here, an extinct fossil form of humanity challenged definitions and assumptions about our own humanity. A century after Darwin's 1859 *Origin of Species*, Louis Leakey's famous discoveries in Olduvai Gorge, Tanzania, of *Zinjanthropus* in 1959 and *Homo habilis* in 1960 attempted to re-define the origin and definition of the genus *Homo*, and a concept of humanity was conceived that was more ancient than had previously been envisaged. Today, we know that the evolution of our genus *Homo* and the evolution of our own species, *H. sapiens*, is far more complex and interesting than envisaged only a few decades ago. We know, for example, that Neanderthals and Denisovans (an extinct type of humanity recognised only in 2010) are cousins from the same genus, and archaeology and genetics have revealed a colossal overlapping in the behavior of Neanderthals and *Homo sapiens* that challenge notions of our own uniqueness.

We know that one million years ago, a new structure of the skull and body appears with the emergence of characters that we have traditionally associated with modern humans and the

Neanderthals: high-volume brain hominins. We must recognize a deficiency in the fossil record to understand the origin of these changes especially in regard to the end of the Lower Pleistocene and the early Middle Pleistocene. In order to explain the step in a linear model between *Homo erectus* and modern humans we should try to understand the change from a relatively small and flattened skull to a more voluminous and bulkier skull of the *sapiens* lineage along with the modifications of the face itself; however, we do not have a complete fossil record and the last common ancestor of large brained hominins – us and Neanderthals – continues being an *enigma*.

## The central question is what would be the common ancestor of modern human and Neanderthal? What is the antiquity of the common ancestor?

A model with a prominent face and a facial configuration that fitted a human face led to talk about a new species. This predecessor could then be a precursor species of modern forms, and also the common ancestor of both *H. sapiens* and Neanderthals. The common ancestor could have given rise to two lines in Africa: the lineage of *H. sapiens* starts from the populations of a *Homo* ancestor who remained in Africa. The lineage of the Neanderthals would have its origin in some precursor populations that left Africa and arrived to occupy western Eurasia. Once in the Eurasian territory, the lineage evolved gave rise to the first ante-Neanderthals, called *H. heidelbergensis*. Already our knowledge about the number of populations or different species that were dispersed throughout Europe throughout the Pleistocene and Middle Pleistocene is still very embryonic, and the access roads to the continent are still a topic of debate.



Neanderthal Reconstruction, © Neanderthal Museum

Over the last 20 years numerous sites have been added in Europe and Asia to lists of sites related to Neanderthals. They document a fascinating history of development. Today, Neanderthals are a synonym for the people of the Ice Age – their way of life, their knowledge and their abilities. They are deeply rooted in western popular culture as “cave men” and our social memory. Our ancestors and their way of life are the subjects of a vast, worldwide research activity – the results of which, for example in the field of palaeogenetics, have a strong influence in academic contexts.

Between 1997 and 2010, the Neanderthal genetic sequence was reconstructed. In 2010, the Denisovans were first defined as a new genetically defined species. Since then, we have understood the Neanderthal genes that are shared with all modern non-Africans, around 1.5 or 6%, and that may have favored adaptation to some of the most dramatic climates and regions of the



Fogliazza, © Grotta di Fumane/Università di Ferrara

planet. A genomic commonality between the Neanderthal and us begins around 800,000 years ago, but the anatomical differences between us and them no longer fit simple uni-linear schemes. Mosaic evolution may be the dominant pattern: for example, the cranium of an individual may look “primitive” but its face may look “modern”. The fossil record needs to expand to explain if and in what way all these changes in anatomy interacted in producing the Neanderthal and sapiens physique.

Beyond the importance of identifying a common ancestor and beyond questioning the origin and basis of the species *Homo*, the relationship between Neanderthals and modern humans leads us to ask ourselves about the true nature of what it means

to be “human”. All the results obtained from older and more recent archaeological, paleo-anthropological or genetic research confirm an extinct form of Neanderthal humanity, and this places all the narratives concerning the process of candidacy for the World Heritage List in a very special position. With the European Neanderthals, we have the most complete data of any fossil human species. In addition to this certainty, they offer an extraordinary starting point for transnational nominations. Sites, laboratories, research and visitor centers, and collections in museums, make up an extraordinary mosaic that entails the strengthening of inter-institutional collaborations that demand a multi-lateral space of dialogue and collective vision.

The debate on affiliations goes on and this implies that the protocols on research and protection of the sites have to be robust and essential in order to continue generating knowledge. World



Neanderthal Reconstruction, © Neanderthal Museum

Heritage international protection guarantees that the debate can continue, covered by the highest standards of international preservation.

The history of the discoveries of 1856 in the Feldhofer cave gave rise to the forms of inquiry into our origins, our uniqueness, and our antiquity in the world. We cannot forget the case of Forbes Quarry, Gibraltar, where remains of Neanderthals were found in 1846. The Neanderthals initiated a social reflection about our development that was more civilization-related than scientific, three years before the publication of *The Origin of Species*. A new man, and the interpretation hypotheses of J.K. Fuhlrott,



or R. Virchow, or W. King; later the Belgian skeletons from Spy associated with the lithic culture of the Middle Paleolithic Mousterian provided a time horizon for the previous findings as well. Later in the early 20th century Marcellin Boule positioned the Neanderthal lineage as an extinct side-branch of humanity, and today most researchers would agree with that assessment. Since then, we have learnt a vast amount from archaeological sources about their behavior, particularly about their symbolic capacity as indicated by their burial customs, as shown by Ralph Solecki at Shanidar. Today I remember his contributions when I lay my hands on the New York Times article of February 22, 2018, discussing the first misunderstood artists in our history (<http://nyti.ms/2EWKp09>). Over the past five decades we have begun to confirm the existence of another form of humanity, of our humanity, without bringing it into our history with an inferiority complex. For 150 years the story of our humanity has been closely linked to the history of the Neanderthals. A candidacy process must give an account of the meaning of this global civilization-related interpretation. It is also one of the most significant and important debates in human paleontology.

landscape, ecologies and paleo-environmental diversities, as well as the need to track the individual and group behavior of the populations. If we try to embrace the entire temporal sequence we encounter a huge diversity of living contexts, climates and geographical obstacles that had to be overcome by Neanderthal populations. That very adaptation to diversity may undoubtedly be one of the most outstanding aspects to highlight. The geological context, fauna and flora, topography and climates (sometimes extreme) make *Homo neanderthalensis* an extraordinary case of adaptation to diversity and an extraordinarily important case study on the demography of pre-historic populations. Thanks to the amount of data we have, it is also the most significant case study of the contrasts and connections between the historical, archaeological, skeletal and molecular disciplines. The mitochondrial data profiles three regional groups: the northern Eurasian, the southern Eurasian, and the vast east Siberian. These are extinct human populations that lived in similarly vanished landscapes. The inclusion in the nomination file of all the scientific information on the excavations, as well as the canonical taphonomic documentation on the



Attendees of the International Workshop #NeanderthalCluster, November 2017 at Neanderthal Museum, Germany

The national teams must decide whether the Neanderthal narrative begins with the early Neanderthals, descendants of the populations that arrive in Europe from the second half of the Middle Pleistocene (prior to 115,000 years ago, cases such as Mauer, Bilzingsleben, Steinheim, Swanscombe, Petralona, Atapuerca (Sima de los Huesos), Aragón), or if it is the classic period (populations from the last glacial cycle in Western Europe during the last ice age, between 115,000 to when they became extinct ca. 30-40,000 years ago). They should also decide whether to include the Levantine Neanderthals (beyond the inscribed site of Mount Carmel) and other regions of Asia. The narratives of Outstanding Universal Value must justify the inclusion or selection of certain zones of dates and their geographies. It will be necessary to decide if the narrative of *Homo neanderthalensis* is focused on situating the OUV of the candidature in the populations that lived in the western end of Eurasia between 300,000 and 28,000 BP, or if another type of thematic or geographical narrative is accepted by collective agreement. The proposal for candidature could be related and limited to Ice Age Neanderthals as well, that means Neanderthals of the last glaciation and interglacial i.e. <125.000 years old.

In addition to the where and when of the phenomenon we must include how Neanderthals adapted to the Pleistocene

layout of the archaeological site are indispensable for the justification of their adaptive capacities. The sediments and archaeological strata are the guardians of the first forms of cultural and biological diversity of our humanity. In the case of a World Heritage candidacy, it is important to argue for the intrinsic relationship between the fossil record and the information obtained from the paleo-environment. Today the research on climatic, biomechanical, energy and even respiratory factors of the paleo-anthropological record confirm that the skeletal robustness of the Neanderthal is present in sites in both extreme and temperate climates. The archaeological and genetic material seeks to articulately clarify the patterns and relationships that govern the development and adaptation of the lineage in a huge number of contexts and environments over hundreds of thousands of years. The nomination file could support the selection of sites on the basis of the way the unique character of each place expresses the diversity of responses from a single lineage.

Another category of analysis when defining the inclusion of components in the series may be to pay attention to sites that have intermittent or continuous occupation. We are still unable to provide a full profile of the dynamics of expansion of the "Out of Europe" movement of the Neanderthals, but the new

investigations in Arabia, in China and the Russian Federation may be able to answer that dilemma.

An essential chapter for this file concerns the inclusion of genomic information. Since 1997 we have the genetic sequence of Neanderthal DNA, from the original Feldhofer site. Today we know that low genetic diversity is evident throughout the evolutionary history of the species. Advances in nuclear paleogenetics obliges us to provide, for archaeological sites with an abundant paleo-anthropological record, forms of protection that facilitate sampling without contamination and to prepare excavation protocols designed to avoid contamination between the nuclear DNA of Neanderthals and modern humans. This leads me to address a fundamental issue regarding the comprehensive conservation of prehistoric sites. The international community must continue to consider protocols that make it possible to guarantee the optimal excavation and preservation of fossil remains that in turn can continue to produce knowledge as methodologies of paleo-environmental, archaeological and genetic analysis are refined and perfected. In this sense, the methodologies applied

**“Beyond the importance of identifying a common ancestor and beyond questioning the origin and basis of the species *Homo*, the relationship between Neanderthals and modern humans leads us to ask ourselves about the true nature of what it means to be “human”.”**

in the investigations of the Sidrón cave (Spain) undoubtedly lay the foundations of a promising pattern of intervention.

There are so many advances in research today that enable us to talk about the lives of groups and individuals. Through zoo-archaeology and the results of isotopic studies, we know that Neanderthals were avid consumers of animal tissues. We also know that from the evidence in many sites it has been possible to document gestation times, forms of growth, life expectancy, and diet. The series of sites chosen for a nomination can extensively justify, according to the current state of research, a whole series of forms of extinct life without leaving much room for conjecture. Now, these sites need to safeguard their conditions of preservation in order to continue producing new data that will complete the knowledge acquired so far, which is undoubtedly much greater than that of any segment of human evolution. The Neanderthals are the favorites when it comes to research into human evolution and that is why a solid OUV statement can be prepared today supported by a plural science in terms of methodologies and geographies.

Today there is already plenty of evidence about the cultural behavior of the Neanderthals. The sites illustrate their forms of territorial control, and the lithic industry since the Middle Paleolithic is the result of very predetermined techniques, refined and deliberate, and there is evidence of the use of fire in Europe contemporary with the Neanderthal occupation of those territories since 250,000 BP. A serial nomination could take into account the inclusion in the series of lithics Modes III and IV. The series could take into account the inclusion of sites where bone-working industries were found, places where there is evidence of the use of wood, shell-working, as well as rock art.

Faced with all the difficulties encountered in different pre-historic landscapes to define areas of occupation, what makes a nomination of Neanderthal sites truly interesting is the great amount of scientific information we possess today about their forms of spatial occupation, about the forms of systematic use of fauna and flora and about the spatial character of the exploitation and consumption of food. These elements provide important arguments to define a “site,” as required by the World Heritage Convention. As we explained earlier, a serial nomination can account for more permanent occupation sites (seasonal but repeated) or places less frequently used but that have been scrupulously studied. The sites reveal a specialization in the use of space, related to collective tasks of systematic hunting of large herbivores (for example, current research in Schöningen or in the Crimean peninsula, Mauran, Les Pradelles, or Salzgitter, etc.), as well as the recurrence of their industries in Eurasia. Their settlements speak of planning, and of a broad knowledge of the geographies of the consumable fauna and flora. The series may incorporate a significant number of sites that prove one of the most important characteristics of behavior

of Neanderthal populations: their wide-ranging mobility. Some archaeologists have even defined some regional patterns as radial Levantine mobility. In terms of structures delimiting habitat space, today we can at least infer it in the most important sites: Moldova I or Abri Romani. We also have important burial sites: Shanidar, La Ferrassie, with evidence of deliberate offerings, the worked dentalium or cardium shells or the ocher, hematite or manganese findings that suggest a symbolic behavior that should be referred to in the candidature file.

As I close these pages I receive the article *U-Th Dating of Carbonate Crust Reveals Neanderthal Origin of Iberian Cave Art*, published in *Science* 359, 2018 (pp. 912-915) and I wonder how many rock art sites already registered on the World Heritage List or its Tentative List should include in their OUV mention of the contribution of the Neanderthal lineage to the symbolic representations that appear on the rocky walls of caves or shelters, or found on archaeological items discovered at these sites, which today allow us to recognize the authorship of *our other* humanity.

More information: <http://www.unesco.org/new/es/mexico/work-areas/culture/heads/>







**Sanz, N. 2017.** For More Sustainable Natural and Cultural Diversity All Over the World.

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# The Way Forward for More Sustainable Natural and Cultural Diversity All Over the World

Nuria Sanz

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As a result of two days of presentations and one day of collective reflection in working groups, the experts who participated in the International Meeting 'Exploring Frameworks for Tropical Forest Conservation: Managing Production and Consumption for Sustainability' presented the conclusions of their working groups.

The principal objective of the meeting was to provide an international, interdisciplinary and interactive forum for the exchange and synthesis of research and progress in conservation of tropical forests and sustainable development from environmental, social and economic perspectives; the results of which are presented in this chapter.

## **Environment**

Covering less than 6% of the earth's land surface, tropical forests house an estimated 50 % of all life on the planet's land mass.

## **Socio-Cultural**

In addition to housing the greatest biodiversity on the planet, tropical forests are also a repository of cultural diversity as home to an estimated 805 million people, including around 50 million indigenous people. The long history of human

environment interaction in tropical forest starting in the Pleistocene and continuing through to the modern day has continuously shaped these environments making them as much cultural as natural landscapes.

### **Economy**

Finally, the economic value of the tropical forest as demonstrated by their importance to the livelihood of local communities and the value of their output of forest products to national economies as well as the demand for such products in the international market, among other indicators, is a significant driving force in their overall production and consumption. Growing population and consumption means that rainforests will continue to suffer intense pressures.

At the same time, climate change threatens to dramatically alter temperatures and precipitation patterns, potentially pushing some forests toward critical tipping points. For example, if current trends continue, it is projected that more than one-quarter of the Amazon region will be without forests (World Wildlife Fund, 2015). Thus, the future of the world's rainforests is very much in our hands. The actions we take in the next 20 years will determine whether rainforests, as we currently know them, are around to sustain and nourish future generations of people and wildlife. Any conservation framework that hopes to be successful must take into account and effectively integrate the very real social, economic and environmental pressures that affect the tropical forest today and, in doing so, will contribute to the realization of the SDGs, the improvement of the quality of human life and the health of our planet.

Mexican rainforests are the most northerly tropical rainforests in the New World. They start around the latitude of Mexico City and run southward in the lower elevations. Mexico is one of world's five most biodiverse countries, home to at least 26,071 species of vascular plants, of which 48% are endemic, and to 2,765 known species of amphibians, birds, mammals, and reptiles, 34% of which are endemic. Rapid industrialization of Mexico and population growth over the last few decades has had a substantial impact on the country's environment and left less than 10 % of its original tropical rainforests standing. At the national level, only 27% of the original cover remained as intact by 1990. At the local level, in the State of Morelos, close to 60% of the original vegetation has been lost and only 19% remains in a forested condition. These remnant forests are restricted to steep slope areas (Trejo and Dirzo, 2016).

During the meeting, national, regional and international experts commented and shared their professional experiences of tropical forest regions –Latin America and the Caribbean, Asia Pacific and Africa–, through presentations of papers, panels, discussions in round tables and more focused explorations in working groups. Traditional and local producers were also invited to present their work and methods of production and views on topics such as sustainability and conservation of biodiversity.



**Figure 1.** Inauguration of the Meeting by the organizing institutions. From left to right: Viktor Elbling, German Ambassador to Mexico; Martín Aluja, Director General of INECOL; Nuria Sanz, Head and Representative of the UNESCO Office in Mexico. © UNESCO.

The meeting served as a platform to develop a preliminary framework that integrates environmental, social and economic dimensions of conservation of tropical forests and sustainability and develop a methodology to successfully integrate academia and market.

The main topics of the meeting were:

1. Interpretation of the past to inform the present and discuss implications for the future: lessons of archaeology and historical ecology combined with contemporary traditional agricultural practices;
2. Conservation and Sustainable Use of Biodiversity: Community resource management, indigenous knowledge systems and production processes including various stakeholders;
3. Patterns of sustainable consumption and production;
4. Approaches to reduce the gap between science and culture in practice – implementation, knowledge sharing and capacity building in tropical forest areas and their peripheries.

The meeting established three Working Groups focused on:

- Archaeological research towards the conservation of cultural heritage in the tropical forest;
- Applying accumulated expertise to minimize impact; Long term studies of the tropical forest landscape;

- Building bridges between academia and current tropical forest traditional food production in Mexico.

Facing many of the same issues as our Mesoamerican counterparts in terms of tropical forest conservation and preservation of the cultural heritage contained therein, the UNESCO Office in Mexico considered this meeting to be an opportunity to collaborate and bridge the gap not only between countries but between continents and bring together a group of more than 40 national and international experts (Mexico, United States, Australia, Indonesia, Philippines, Brazil, UK, France and Norway) united under one goal: to identify ways in which cooperation generates responses to tropical forest situations, seeking harmony between the conservation of resources and a viable economy for human beings; in other words, the human, social and cultural use of diversity. In this regard, the meeting allowed two forms of knowledge to be brought together, the traditional and the academic. Throughout the meeting a dialogue was generated between specialists and producers of oregano, vanilla, *ramón* and coffee in Campeche, Chiapas, Quintana Roo, Puebla and Veracruz.

## Results of the Working Groups

### Group 1: Archaeological Research Towards the Conservation of Cultural Heritage in the Tropical Forest

Robin Dennell (University of Exeter, UK), Eduardo Neves (University of Sao Paulo, Brazil), Stéphen Rostain (CRNS, Paris), Patrick Roberts (Oxford, UK), Victor Paz (University of the Philippines), Timothy Beach (University of Texas), Sheryl Luzzadder-Beach (University of Texas), Christopher Fisher (Colorado State University), Douglas Sheil (Norwegian University of Life Sciences) and Nuria Sanz (UNESCO). The panel agreed the following points:

#### I. Conceptual Issues

1. Rainforests are cultural landscapes in which humans have been an integral part for several millennia in all continents.
2. It is essential to develop appropriate frameworks and an appropriate glossary for discussing rainforests as cultural landscapes and all the related typologies of human interactions in the forest; in particular, the panel emphasized the need to consider the inter-dependent relationships of humans and rainforests, past, present and future.
3. It is also essential to integrate archaeology and other social sciences into ecological research and development/conservation plans for rainforests since these are cultural landscapes as well as natural ones.

#### II. Investigations of Archaeological and Historic Sites in Rainforests

The panel thought it is essential to:

1. Establish that rainforest and archaeological site(s) are contemporary; i.e., it is necessary to establish vegetational and archaeological sequences. These sequences should be as long-term as is practical.

2. Acknowledge that tropical rain forests contain an incredibly privileged reservoir of knowledge that needs to be involved in decision making and policy planning.
3. Establish that it was indeed possible and that there is evidence to support that inhabitants used rainforest resources, and it was not necessary for them to travel and/or trade in nearby and different environments.
4. Identify other sympathetic partners from other disciplines who would advocate for similar conservation methodologies (e.g. wild life/plant conservationists/ primatologists) as supporting agencies.

### III. Conservation of Sites in Tropical Rainforest

The panel agreed that:

1. The conservation of rainforest and its various manifestations of cultural heritage are mutually dependent: conserving one helps conserve the other.
2. Core and buffer zones around archaeological sites should be identified for conservation purposes.
  - Buffer zones around a cultural heritage property are particularly desired and essential in enabling the conservation of that cultural heritage but also its environmental context within a rainforest. Similarly, a buffer zone that defines an area of rainforest also ensures the conservation of the cultural heritage within that zone.
  - We suggest that a buffer zone should be as large as possible, but as small as necessary.
3. In conservation programmes, local communities should be involved and respected so that they value their heritage and we benefit from their local knowledge; there is a clear need here to emphasise the importance of their education and involvement in research; local museums and outreach programmes also have an important role in this context.
4. The guidelines and current status of UNESCO Biosphere Reserves should be updated to ensure the continuing involvement of social scientists to interact with human ecologists to contribute to an optimal level of biodiversity.
5. When conserving stone, especially limestone, monuments in rainforests, care should be taken to ensure that items of artistic or architectural significance should as much as possible be protected by canopy cover to prevent deterioration from direct sunlight and heavy rain. *In situ* archaeological rainforest heritage is not always suitable for preservation after excavation. Protocols for rainforest intervention should be discussed widely as a body of doctrine in international preservation practices.



**Figure 2.** In session during the Meeting.  
© UNESCO.

#### IV. The Benefits of International Status for Preserving Sites and a Rainforest Buffer Zone

International status for tropical forest areas is an important tool for ensuring the preservation of cultural heritage within a rainforest buffer zone. Numerous examples could be mentioned as potential candidates: the panel suggested the following:

##### 1. Meso-America

- Rio Hondo transboundary watershed area with its many square kilometres of wetland fields crossing between Mexico and Belize and Guatemala;
- Laguna de Terminos – ‘chinampas’ of the Battle of Cintla<sup>1</sup> site and vast area of never studied wetland complexes;
- Cenotes, the unique cultural connection of tropical forest and karst landscapes that encapsulates a large range of types of interventions since the Pleistocene through the ancient and modern Maya periods. This is the quintessential Yucatan Maya ecoregion;
- El Pilar: The unique transboundary Maya Forest Garden between Guatemala and Belize.

##### 2. Central America

- La Mosquita region in connection with the World Heritage site : Rio Platano Biosphere Reserve; this site was inscribed in 1982 under criterias (vii), (viii), (ix) and (x) (see <http://whc.unesco.org/en/list/196>);

##### 3. South America

- Chiribiquete, Colombia. This site was inscribed on the Tentative World

1. First battle in the Americas where horses were used.



**Figure 3.** In session during the Meeting. © UNESCO.

Heritage List in 2012 under criterias (iii), (vii), (viii) and (x). (see <http://whc.unesco.org/en/tentativelists/5758/>);

4. Amazonia Region

- Mojos, Bolivia;
- Upano River Valley, Ecuador;
- Shell mounds (*sambaquis*) of Monte Catelo Guapore;
- Rio Grande, Amapa, Brazil;
- Terra preta, Hatahara site, Brazil;
- Megaliths/Geoglyphs inside forest, Amapá state, Brazil;
- Rock art – Monte Alegre, Brazil.

5. South Asia

- Sri Lanka: Fa Hien, Beli-lena Kitulgala, Batadomba–Lena are already nominated as indicating the earliest inhabitants of Sri Lanka; however, their adaptation to a rainforest environment is specifically not mentioned in the nomination as a key factor for future research and management plans. The same is true of the historic monuments in “the cultural triangle” rainforest Polonnaruwa (primate research/ forest encroachment).
- The Vedda area: the Veddas are rainforest hunter–gatherers believed to be of great antiquity, and are currently under threat from deforestation and habitat fragmentation.

6. South–East Asia

- Sulawesi: the painted caves of Sulawesi date to c. 38,000 years old as has recently been reported from the caves of Maros and Bone; these are among the oldest examples in the world and challenge long held assumptions that art of this kind originated in southwestern Europe; it is an obvious candidate for consideration.



7. South West China
  - The caves of Maludong and Longlin contain evidence of a Late Pleistocene, archaic population of *Homo sapiens sapiens* that inhabited a rainforest region.
8. New Guinea
  - The Ivane Valley contains evidence that humans were utilising upland regions of the New Guinea highlands by ca. 49,000 years ago.
9. The Philippines
  - The caves around Tabon on Palawan Island contain evidence of late Pleistocene occupation, and are in a modern rainforest environment. This site was submitted to the Tentative World Heritage List in 2006 under criteria's (ii), (iii), (iv) and (v).
10. Africa
  - Matangai Turu Northwest rock shelter site, Democratic Republic of Congo. Late Holocene Site in African lowland tropical forest.
11. Australia
  - Diyer and Mulgrave II are two examples of rainforest usage by prehistoric indigenous Australians.

## V. Investigation of the Human Dimensions of Biodiversity in Rainforests as Cultural Landscapes

There are several methodologies that can be used either diachronically or synchronically to investigate the diet, subsistence and material culture of the inhabitants of rainforests as well as their associated climate and environment. Many of these are highly specialised and best undertaken through international cooperation. The panel suggested the following as examples:

1. Stable isotope methods;
2. Phytoliths, starch grains;
3. Speleothem climate records;
4. Long term pollen records;
5. Lipids and residue analysis;
6. LIDAR and remote sensing;
7. Ethnographic records;
8. Linguistics;
9. Forest inventories;
10. Genetics of modern and previous inhabitants of rainforests;
11. Primatology and animal ecology and behaviour;
12. Micromorphology of soils and living spaces.

## VI. Narrative for Comparative Studies

Records of human occupation of rainforest in different parts of the world offer numerous opportunities for comparative studies. The panel suggested the following:

1. Settlement patterns and land use in tropical forest environments;
2. Diversity of human practice in rainforest;
3. Water and soil management;
4. Human interaction with the environment;
5. Foodways of the forest;
6. Evolution of language diversity: naming beings, naming processes, naming natural cycles;
7. Tropical hazards and cultural resilience in rainforests (e.g. volcanoes, lahars [catastrophic mud-flows], typhoons/cyclones, tsunamis, El Nino/La Nina);
8. Rainforest and myths.

### **Group 2: Applying Accumulated Expertise to Minimize Impact; Long Term Studies of the Tropical Forest Landscape**

Lisa Lucero (University of Illinois at Urbana-Champaign, USA), Anabel Ford (University of California, Santa Barbara, USA), Jose Iriarte (University of Exeter, UK), Sergio Guevara (Programa para El Hombre y la Biosfera (MaB) UNESCO, México), Steve Turton (James Cook University, Australia), Rui Murrirta (University of São Paulo, Brazil), Herwasono Soedijto (Indonesian Institute of Sciences (LIPI), Indonesia), David Bray (Florida International University, USA)

**Goal: Promote and restore healthy and productive forested landscapes. Encompassing the following SDGs:**

1. Goal 6. Ensure availability and sustainable management of water and sanitation for all.
2. Goal 12. Ensure sustainable consumption and production patterns.
3. Goal 13. Take urgent action to combat climate change and its impacts.
4. Goal 15. Protect, restore, and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss.
5. Goal 16. Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels.

**Priorities aligned with SDGs:**

1. Goal 6 (water)
  - Cultural and biological diversity towards maintained or increased ecosystem goods and services.
    - Understanding the dynamics and interactions at landscape scale from the past, present and future of the traditional knowledge of water management.
    - Research of cenotes, the largest freshwater sources in karstic subterranean landscapes.
2. Goal 12 (sustainable consumption and production)
  - Anthropological research to increase the leverage traditional smallholders while decreasing support from subsidies to change agricultural patterns of production and consumption.



**Figure 4.** Panelists presenting during the Meeting. Standing: Douglas Sheil, Norwegian University of Life Sciences, Norway. © UNESCO.

3. Goal 13 (climate change)
  - Highly vulnerable to climate change;
  - Resilience;
    - Learn from deep history;
  - Habitat diversity, forms of occupation, from villages to ‘urban development’ in tropical forest;
  - Carbon sequestration as long-term storage of carbon dioxide or other forms of carbon to either mitigate or defer global warming and avoid dangerous climate change;
  - Sea level rise;
  - Climate moderation/stable state;
  - More extreme events: periodicity and intensity in long-term sequences.
  
4. Goal 15 (protect, restore, and promote sustainable use; halt and reverse land degradation; halt biodiversity loss)
  - Safeguard connectivity
    - by wildlife corridors;
    - by genetic flow;
    - by organismal migration (ex. Moving uphill in cloud forest);
      - Latitudinal or altitudinal.
  
5. Goal 16 (inclusive institutions at all levels)
  - Promote local bee populations: a good example of the revival of traditional

production is the women's cooperative of Ich Ek, in Calakmul. The cooperative, whose members are seven indigenous women from a small rural community, has turned the traditional melipona honey production into their main economic activity. By accessing and preserving traditional knowledge, the project promoted environmental sustainability. In cooperation with the UNESCO Office in Mexico, this project also elaborated criteria and guidelines to improve cooperative practices for production and distribution and enhance awareness of the added value of culture within apiculture. The cooperative model brought local producers together to share knowledge and experiences for improving melipona honey production (see [goo.gl/bwMu10](https://goo.gl/bwMu10)).

- Addressing the social and cultural consequences of the construction of big infrastructure (e.g. dams, roads, oil, gas lines, etc.).

### Methodologies:

1. Promote and restore productive and healthy forested landscapes.
  - Promote and enhance vibrant multiple use forested landscape.
    - Culturally and biologically diverse;
    - Maintain pollinator populations;
    - Integrate urban-rural environments by awareness raising campaigns to develop suitable consumption patterns for their sensitive neighbourhoods.
  - Inform restoration projects
    - Use archaeology, historical ecology, geomorphology, paleoecology, and ethnobiology to determine baselines and needs.
    - Take into account connectivity, biodiversity, commodity production, ecosystem services and future resilience patterns.
2. Linking landscapes between administrative and institutional boundaries
  - Methodologies that consider the entire landscape with links to local and indigenous populations and to promote international research networks.
  - Promote inter- and intra- continental connectivity.
    - Inter-agency coordination and spatial planning
3. Define and select sentinel/tipping-point landscapes and create a monitoring programme.
4. Encouragement and creation of institutions that improve smallholder relations and can organize and regulate actions:
  - La Via Campesina is the international movement which brings together millions of peasants, small and medium-size farmers, landless people, women farmers, indigenous people, migrants and agricultural workers from around the world. It defends small-scale sustainable agriculture as a way to promote social justice and dignity (see <https://viacampesina.org/en/>).
5. Set up protocols at national, state and regional scales to address the social and cultural challenges and consequences for the construction of big infrastructure.



**Figure 5.** Panelists presenting during the Meeting. Standing: Aniceto Caamal Cocom, Fundación Melipona Maya, Mexico. © UNESCO.

### Group 3: Building Bridges Between Academia and Current Tropical Forest Traditional Food Production in Mexico

**Participants:** Aniceto Caamal Cocom (Fundación Melipona Maya A.C., México), Cristina Rodríguez Azate (Cooperativa Selva Viva 3G, México), Elleli Huerta (CONABIO), Elvira Durán (Instituto Politécnico Nacional de México), Irina Llamas Torres (Mujeres Mayas y Orégano del Monte), Martha Rosas (CONABIO), Paulina Hidalgo Diego (Suame Titekijtok Tonantzin SPR de RL), Pedro Carlos Álvarez-Icaza Longoria (CONABIO), William Balée (Tulane University, USA)

- The future of tropical conservation depends substantially on local groups (organizations, cooperatives, social or producer associations, communities, etc.).
  - These local groups need the support of external actors interested in preserving the natural and cultural integrity of tropical landscapes.
  - These local groups should establish and / or maintain long-term compatible relationships with the diversity of species, landscapes, languages and cultures.
1. What should the bridge between local knowledge and academic knowledge look like?
    - It is essential that there is collaboration between academia and local actors (ethnic groups, producers, etc.), multi-level and multi-stakeholder.
    - In the process of developing a bridge, it is important to:

- Preserve;
  - Strengthen local capacities;
  - Support people to systematize their culture, their language and their knowledge;
  - Develop local markets for sensible consumers;
  - Propose productive alternatives and measure the impacts;
  - Tackle climate change, stocking narratives of past events and synthesizing responses;
  - Share knowledge by practice at international level;
  - Innovate and develop new types of knowledge by introducing new sustainable technologies.
- A collaborative process for building and knowledge sharing and knowledge between academia and local actors should be established by introducing new sustainable technologies.
  - The traditional link between academics and local stakeholders is through research or theses related to applied conservation methods. An additional approach is participatory research (monitoring b.p., inventories), which involves training and strengthening capacities of both parties, particularly of young people or young researchers, in rural management and tropical forest knowledge.
  - Orient research to the needs and priorities of local actors.
  - Local knowledge is valuable, but must adapt to changing conditions and unexpected contexts such as climate change scenarios. Their resilience capacity should be analysed by comparative research.
  - There are different models of collaboration for tropical conservation. These models should:
    - Help guide public policy comprehensive and collaborative;
    - Incorporate monitoring tools to recognize and evaluate the progress of their application;
    - Be designed according to local contexts and recognize that there are different conditions and can be replicated exactly;
  - For Mexico, we recommend a comprehensive systematization and sharing of existing experiences in the implementation of collaborative models for conservation.
2. How do we strengthen the capacities of local stakeholders to manage their knowledge?
- Local actors have knowledge and skills, but often cannot systemize.
  - Academia must raise interest and develop skills for local actors to learn about their tangible and intangible resources (culture, languages, landscapes and species).
  - It is essential to encourage the producer organizations to have professionalized equipment that can serve as a bridge between the technical and scientific knowledge and the needs of producers.
  - The more organized and empowered communities should develop their own relationship with researchers and policy, defining what they need to research and apply the results of the investigations. Research protocols should be in place.

- In addition, if possible, local or indigenous communities need to develop their skills and encourage the involvement of some representatives from their communities to be trained in formal education.
  - With information, producers can form their own agenda to interact with external actors.
  - Academia can help in identifying and promoting rainforest cultural heritage. Scientific commitment for conservation should be developed.
  - Academia must be allied to communicate local knowledge:
    - Provide evidence;
    - Systematise knowledge;
    - Disseminate and promote products and sustainable practices;
    - Inform on exploitation of local groups affected by illegal practices.
  - It is important to consider that rural and urban communities also require knowledge.
3. How do we incentivize academic institutions to link with local actors?
- It is necessary that scientific research is comprehensive and used to preserve and strengthen knowledge of relevant communities involved, respecting rights and generating a trustworthy system of knowledge exchange, according to agreed upon research protocols.
  - There is a gap between local and academic knowledge because scientific knowledge and research often does not return to communities and local actors.
  - Scientific information should be translated and transferred to local actors who participated in its creation or who could benefit from it.
  - The effort to disseminate knowledge among stakeholders is not necessarily considered part of academic production.
  - Generally, sources of funding for research do not allocate resources to support communication between academia and local actors such as dissemination materials, training workshops, mechanisms to return and transmit the acquired knowledge and the results of their investigations, etc.
  - One way to transfer knowledge is to develop policies to link academic and scientific institutions with rural production and develop technology transfer mechanisms (systematizing the experiences of producers and transferring scientific knowledge). Another way is to encourage the use of mechanisms such as social service students, teachers and researchers to apply their knowledge and conduct research to address local problems, and do outreach.
  - In addition, an effort should be made to find effective ways of returning the knowledge gained through the use of local languages, joint identification of products that are useful for the dissemination of results (eg, puppet show, local radio, and reports in their languages).
  - The return of results opens the door for researchers to maintain the relationship with those local actors and promotes the formation of strong interactions of compromise between researchers and local actors, with support from external agents.



**Figure 6.** Cultural and Natural Heritage of Campeche, Mexico.  
© UNESCO / Nuria Sanz.

## Epilogue

Tropical forests once covered 14% of the earth's land surface and today that number has been reduced to less than 6%. Even so, they contain the greatest biodiversity in the world, are home to an estimated 805 million people and account for substantial economic value. Additionally, tropical forest mixed World Heritage sites present a unique context for exploration and research, since they contain both impressive natural and cultural Outstanding Universal Value. The UNESCO Man and Biosphere Programme continues to be a great example for the rational and sustainable use and conservation of the natural resources through cultural practices for the improvement of the overall relationship between people and their environment.

Vestiges of past human occupations lie beneath thick forest canopies, are covered by tropical overgrowth or buried under the surface of the Earth, invisible to the human eye. However, through scientific research, we can begin to piece together the very long history of human presence in these cultural landscapes.

The question then becomes, what can we learn from this information, especially during a time of unprecedented deforestation, climate change, food insecurity and water shortages. Archaeological research has made it apparent that these challenges are not unique to contemporary times. Tropical forest cultures being the place of old questions and some of the earliest answers. This publication demonstrates an effort to contribute to the scientific and traditional knowledge link as a facilitator of a sustainable future of bio-cultural relations.





**Figure 7.** View of the tropical forest canopy. UNESCO World Heritage site: Ancient Maya City and Protected Tropical Forests of Calakmul, Campeche, Mexico. © UNESCO / Nuria Sanz.

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**Sanz, N. 2015.** Conclusions and the way forward.

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# Conclusions and the way forward

# 3

**Nuria Sanz**

*Head and Representative of the UNESCO Office in Mexico*

From 25 February to 1 March 2013, an international meeting, *Human Origin Sites in Eurasia and the World Heritage Convention*, was held at the University of Tübingen, Germany, with the participation of 29 experts of 13 different nationalities, representing 25 international institutions. The meeting was organized and financed by the UNESCO World Heritage Centre, the Spanish Funds-in-Trust for World Heritage, the University of Tübingen and the German State of Baden-Württemberg.

The meeting's aims were i) to establish links between scientific research and conservation by achieving recognition of the scientific value of properties related to human evolution; ii) to operate within the framework of the Global Strategy launched by the World Heritage Committee in 1994 to broaden the definition of 'World Heritage' and to contribute to an equitable representation of all of our planet's natural and cultural diversity since its origins; iii) to achieve recognition for sites containing significant traces of early interaction between humans and the earth, early cultural behaviour, cognitive milestones and creative expressions in Eurasia; iv) to conserve listed properties from gradual deterioration on account of their antiquity and the vulnerability of their component materials; and v) to discuss the best practices to preserve the future research potential of records.

## Background of the meetings

The meeting was planned as a result of invaluable discussions and recommendations from the UNESCO international meeting, *Human Evolution and the World Heritage Convention*, which took place from 21 to 25 March 2009 in Burgos, Spain. While the meeting in Burgos focused on sites related to Human Evolution from a global perspective and analysis, this meeting aimed to provide a regional focus in support of the future conservation of human origin sites in Eurasia. It also follows the first and second meetings in a series of regional meetings in the framework of the HEADS Thematic Programme, *African Human Evolution sites and the UNESCO World Heritage Convention*, (Sanz, 2012) which took place from 5 to 12 February 2011 in Addis Ababa, Ethiopia, and *Human Origin Sites and the World Heritage Convention in Asia* (Sanz, 2014), which took place from 24 to 28 September 2012, at the Jeongok Prehistory Museum in the Republic of Korea.

Within the context of these objectives, three fundamental considerations were requested of participants for the discussions in Germany:

1. The most pragmatic notions to be considered in defining a site related to Human Evolution. Which evaluation features are the most relevant?
2. The most important narrative aspects of the sites in identifying and prioritising possible thematic studies that could be proposed to the World Heritage Committee.
3. Good practice studies to be carried out on an international scale to help the preservation and development of Human Evolution sites (individual sites or clusters of sites benefiting the whole community, and transversal initiatives such as documentation or training networks).

29 participants attended the meeting, including representatives of the Advisory Bodies of the World Heritage Convention, site managers, national, regional and international experts, and representatives of the German Government. At the meeting (as with other UNESCO HEADS meetings), participants were asked in advance to complete a questionnaire seeking their opinions on these issues. The intention was to identify the core issues and values, and the range of concerns expressed by participants from a diverse range of institutions and countries. These opinions have played an important role in informing discussions and in helping us to arrive at a consensus of opinions.



*Participants of the international meeting, Human Origin Sites in Eurasia and the World Heritage Convention, held at the University of Tübingen, Germany © WHC UNESCO/Nuria Sanz.*

The following key areas were elaborated throughout the plenary sessions and Working Groups:

- Narratives
- Criteria
- Interdisciplinarity
- Serial nominations
- Cave Sites and the World Heritage Convention

This meeting provided an important step in strengthening national and regional cooperation and capacities in support of the future protection and sustainability of human origin-related sites in Eurasia. In line with activities of the UNESCO HEADS Action Plan, the meeting also offered a regional platform to evaluate current methodologies for establishing the Outstanding Universal Value (OUV) of related sites for potential future inscription to the World Heritage List as well as developing guidelines on applied research for conservation, and specifically conservation of caves.

This work was primarily achieved through a several multilateral working groups focused on a series of complimentary themes: i) the identification of human evolution narratives for establishing the Outstanding Universal Value of sites; ii) the interpretation of the criteria of the World Heritage Convention in the framework of the principles of the HEADS Thematic Programme and the role of criterion (viii) which states 'be outstanding examples representing major stages of earth's history, including the record of life, significant on-going geological processes in the development of landforms, or significant geomorphic or physiographic features<sup>1</sup>; iii) ; interdisciplinary approaches for conservation, curation and research; and iv) the viability of serial nomination in the context of the current state of research on Neanderthals; approaches to research in karstic archaeological landscapes, including ethics, techniques and documentation of finds.

The results of these working groups were presented over several days by the invited experts and by means of visits to cave sites in the Swabian Jura of the Ach and Lone Valleys, including the sites of Hohle Fels, Geissenklösterle and the Archaeopark at Vogelherd, where some of the earliest evidence for music (in the form of ivory and bird bone flutes) and figurative art (including mammoths, horses and, most recently, a female figurine) in Eurasia. This multidisciplinary approach to the meeting resulted in a series of outcomes which take into account the exceptional nature of human evolution and, in particular, cave sites when defining a *site* (as defined by the World Heritage Convention), in addition to determining the best way to identify and preserve its OUV, whilst acknowledging and attempting to ameliorate the tension between the

<sup>1</sup> This is covered in a separate document by Dennell, this volume.



*The meeting's participants walk to Vogelherd Cave  
© WHC UNESCO/Nuria Sanz.*



*The south-west entrance to Vogelherd Cave © WHC UNESCO/Nuria Sanz.*



*Discussions in the Lone Valley © WHC UNESCO/Nuria Sanz.*



*The entrance to Hohlensein-Bärenhöhle Cave © WHC UNESCO/Nuria Sanz.*

ethics of site protection and the advancement of scientific knowledge of our shared human origins. To this end, several practical techniques for documentation and conservation were shared, the latest research and theoretical approaches to the Eurasian archaeological record were discussed, and several avenues for interdisciplinary cooperation through all the stages of site research - from discovery to analysis to the permanent curation of excavated artefacts and their attendant records - were established, in light of the implementation of the HEADS Thematic Programme for World Heritage.

### Genetic studies

Furthermore, the emerging importance of genetic studies in research on human migrations and dispersals was addressed. Previously, scientists had relied on morphological evidence from human fossil remains, as well as the spread of material cultures, to trace human migrations. The burgeoning field of genetic studies has offered a novel avenue by which to examine human dispersals and migrations. Although it has been cautioned that genetic evidence should be used in conjunction with these traditional methods for tracing dispersals, recent studies have not only been able to pinpoint likely geographic loci for important dispersal and divergence events in the spread of humans across Eurasia, but have been able to place tentative dates on these events, based on extrapolated rates of genetic change. Whilst many of these studies are in their nascence, the field of genetics offers a promising new line of evidence, with provocative new data, that should be considered in concert with traditional biological and material culture based models of human dispersals. A particularly important development that was unthinkable only a few years ago is the extraction of ancient DNA (aDNA) from fossil skeletal remains. As a result, the genetic profiles of several Neanderthals and early *H. sapiens* have been obtained, and a new palaeospecies – the Denisovans – has been identified solely on the basis of its aDNA.

### Narratives of human evolution in Eurasia

In addition to new scientific approaches to the record, certain ongoing narratives of human evolution in Eurasia and their potential OUV were discussed. In Eurasia, narratives of human evolution take place primarily during the Palaeolithic, a human cultural time-period lasting from the first dispersal of our hominin ancestors to Eurasia approximately 2 million years ago, until approximately 18 thousand years ago. This vast swath of human history was notably marked by several migrations and dispersals of hominins out of Africa and across Eurasia, the first evidence and subsequent flourishing of a human symbolic tradition, and witnessed the eventual extinction of every hominin species on earth, save for our own. The working groups took on the task of defining the primary narratives during this major period in human history. Traditionally dividing the period



*A visit to Archäopark Vogelherd while under construction © WHC UNESCO/Nuria Sanz.*

into the Lower, Middle and Upper Palaeolithic according to shifting material culture phases, the working groups defined the major narratives in ‘becoming human’ for each period. For the Lower Palaeolithic, the initial settlement of western Eurasia was identified. For the Lower and Middle Palaeolithic, the dispersals, interactions and eventual extinction of the different hominin biocultural lineages were identified. For the Late Middle and Upper Palaeolithic, the dispersal and spread of modern humans and the emergence of behavioural modernity were identified. The experts discussed the narratives and the related sites that exemplify them (listed below) and agreed that they constitute the most compelling evidence for Outstanding Universal Value in this period of our heritage.

In particular, the Neanderthal narrative offers potential for a possible serial nomination. Neanderthals were another hominin species that flourished in the cold climates of Eurasia during the Palaeolithic. They serve as a universal symbol for human evolution and are indispensable for our own thinking of human history. Sites throughout Eurasia bear witness to their expansion, their adaptations, their interaction with modern human groups and their eventual extinction. Neanderthals represent our closest relative in the hominin family tree and recent genetic studies have shown that human groups outside Africa all share 2.5% Neanderthal DNA. Neanderthal biology and material culture show the first stirrings of modern brain size, capacity for symbolic thought and burial of the dead that would eventually flourish with modern human groups during the Upper Palaeolithic. Not only are Neanderthals (and their attendant archaeological sites) exceptional among our hominin ancestors, but historically, discoveries of Neanderthal fossils represented the beginning of modern palaeoanthropological discourse, forever altering the paradigms of the story of human origins.

### Site protocols

Beyond the compelling human evolution narratives offered in Eurasia and from a practical standpoint, there is still much work to be done concerning protocols for the study, conservation and curation of sites. Though sites are the source and locus of information, the collections of artefacts created by site excavation are an integral part of these sites. This idea that the importance of the movable heritage should be incorporated into the concept of a site and the OUV of a site emerged as an important theme. To this end, several suggestions were made, advocating dialogue between the researchers who discover, excavate and study the materials, and the museum curators who are tasked with the stewardship of the materials for future generations. The extent of these recommendations are detailed below but notably include having a curatorial plan in place from the beginning of excavation campaigns, digitising artefacts as well as excavation records and using technological tools such as cloud technologies to disseminate information in a comprehensive and compatible format.

Because many important human evolution sites are cave sites, owing to the advantageous preservation conditions offered to very ancient deposits by these protected environments, a meeting of experts on issues related to the Palaeolithic was an opportune moment to examine the relationship between the unique case of cave sites and the World Heritage Convention, in terms of the ethics of study and conservation, documentation and techniques. Although the results of these discussions are related in further detail below, several suggestions were made in determining protocols for caves research that take into account their unique and finite nature, their ongoing importance to local cultural traditions, economies and natural ecosystems, as well as the need for flexibility in protocols concerning unexcavated caves, previously excavated caves and rescue and salvage

situations. Digital documentation is highly recommended for its comprehensive, low cost and easily transferable nature. The call for interdisciplinary cooperation, and comprehensive recovery and study of materials is of paramount importance, as is the preservation of *in situ* sediments and stratigraphic sections wherever possible. Caves represent a unique, bounded, often well preserved and finite resource for information about our past, and protocols for their study and conservation should reflect this exceptional nature.

### Conclusions from the Working Groups

Three major themes were covered by the Working Groups. These were i) the narratives of human evolution sites in Eurasia; ii) interdisciplinary cooperation for conservation, research and curatorship; and iii) how to improve institutional cooperation standards for research in caves. Each will be considered in turn.

The working groups were invited to support sites that could be considered in the future for possible candidacy, when research has advanced to such a level that the site could meet the requirements of the World Heritage nomination process.

#### 1) Narratives/OUV Human Evolution sites in Eurasia

As background, the following properties on the World Heritage List and the Tentative List have already been identified as some of the most significant Human Evolution related Prehistoric sites in Eurasia:

##### World Heritage List

**France:** Prehistoric Sites and Decorated Caves of the Vézère Valley; inscribed in 1979 under criteria i) and iii<sup>2</sup>); this nomination includes Lascaux, Laugerie Haute and Basse, La Micoque, La Madeline, Font de Gaume, La Mouthe, Le Cap Blanc and Le Moustier

**France:** The Grotte Chauvet-Pont d'Arc, Ardèche; inscribed in 2014 under criteria i) and iii)

**Israel:** The Human Evolution sites at Mount Carmel; inscribed in 2012 under criteria iii) and v)

**Spain:** The archaeological and fossil hominin sites of the Sierra de Atapuerca; inscribed in 2000 under criteria iii) and iv)

**Spain:** The Cave of Altamira; inscribed in 1985 under criteria i) and iii)

##### Tentative List

**Bulgaria:** The Magoura Cave with Drawings from the Bronze, added as a cultural site in 1984

**Georgia:** the Dmanisi Hominin Archaeological Site; added in 2007 under criteria iii) and v)

**Italy:** The Lower Palaeolithic Palaeosurfaces at Isernia-La Pineta and Notarchirico; added in 2006 under criteria iii), iv) and v)

**Italy:** the karstic caves in prehistoric Apulia, including the Grotta Romanelli and Grotta delle Veneri; added in 2006 under criteria i), ii) and iii)

**Russian Federation:** Bashkir Ural, added in 2012 as a mixed site, under criteria i), iii), v), vi), viii), x).

**Turkey:** Karain Cave; added in 1994, under criteria iii) and vi)

**United Kingdom of Great Britain and Northern Ireland:** Creswell Crags, England; added in 2012 under criterion iii)

**UK:** Gorham's Cave Complex (Bennett's, Gorham's, Vanguard and Hyena); added in 2012 under criterion iii);

The Working Group considered that there was considerable scope for widening the list of sites, or groups of sites, with Outstanding Universal Value (OUV).

The Main Narrative that was identified was 'Becoming Human in western Eurasia' (starting with Homo, and excluding rock art & the Mesolithic).

#### a) Earliest settlement of western Eurasia (Early Pleistocene, Lower Palaeolithic)

The two obvious 'flagship' sites of western Eurasia that contain the most significant hominin skeletal evidence and associated Palaeolithic stone tools are **Atapuerca** (Spain) and **Dmanisi** (Georgia). Of these, the Atapuerca group of sites includes **Sima**



Kurt Wehrberger and Jiri Svoboda looking at a copy of the Lion Man © WHC UNESCO/ Nuria Sanz.





Participants at the Plenary Session of the HEADS team on Eurasia at Castle Hohentübingen © WHC UNESCO/Nuria Sanz.

**del Elefante**, with the earliest skeletal evidence (c. 1.22 Ma) from western Europe; **Gran Dolina**, with its record of *Homo antecessor* c. 0.8 – 0.9 Ma, and **Sima de los Huesos**, with a unique assemblage of 29 individuals of *H. heidelbergensis* c. 450,000 years old. As noted above, the Sierra de Atapuerca was inscribed as a World Heritage site in 2000 under criteria iii) and iv). Dmanisi, dated at 1.75-1.85 Ma, contains 5 crania and associated post-cranial material of a very primitive form of *H. erectus* and is currently the earliest site outside Africa with hominin skeletal evidence. Large numbers of stone tools and faunal remains have also been found. This site was placed on the Tentative List in 2007 under criteria iii, v.

Also in Spain, the Orce Basin near Malaga contains the important sites of **Barranco Leon** and **Fuente Nueva 3**, dating to c. 1.0 – 1.4 Ma; these contain pre-Achelean, Oldowan type lithic assemblages and associated mammalian remains.

In north-west Europe, evidence as early as c. 1.0 Ma has been found at **Happisburgh** and **Pakefield** (UK), and opened a new chapter in the earliest occupation of northern Europe. The site of **Boxgrove** in southern England is dated to 478-526 Ka, and contains a superlative Acheulean assemblage that is associated with the butchery and possibly hunting of horse and rhinoceros.

There are also important sites that should be considered worthy of World Heritage status in the Jordan Valley. **'Ubeidiya** has a long sequence of stone tools associated with a former lake and dated to 1.0 – 1.4 Ma; **Gesher Benot Ya'aqov** (GBY) is dated to c. 0.78 Ma, and contains very early evidence for the hunting of large animals, the use of fire, processing plant foods, and a rich lithic assemblage.

### **b) Eurasian bio-cultural lineages (Middle Pleistocene/Late Pleistocene and Lower and Middle Palaeolithic)**

The **Mount Carmel** caves of **Skuhl**, **Tabun** and **el-Wad** in Israel are crucial 'flagship' sites that document a 400,000 year sequence and the earliest evidence for *H. sapiens* outside Africa c. 125-100 Ka ago. As noted, these were inscribed on the World Heritage List in 2012 under criteria iii) and v). In neighbouring Syria, there is a very important group of sites at **El Khowm**, with key sites of **Nadaouiye Aïn Askar** and **Hummal**, that have a long sequence extending back to c. 1.0 Ma. Also in Syria, the rock-shelter of **Yabrud** has a classic sequence of artefacts extending beyond 200 Ka and the local vicinity contains important Palaeolithic sites.

Europe has the most detailed record of hominin evolution and associated cultural evidence for the Middle Pleistocene (0.78-0.125 Ma). There are several sites or groups of sites that can be highlighted:

**Schöningen** (Germany): this open-cast coal mine contains numerous lower Palaeolithic sites that include ones with remarkably well-preserved, 350 Ka-old 2-metre long wooden spears and evidence of horse hunting, as well as some of the earliest evidence for using fire.

**Torralba and Ambrona** (Spain): these two Acheulean sites in the province of Soria are c. 300-400,000 years and are suggestive of the hunting or scavenging of elephants.

**The Somme Valley** (France): this is the birthplace of Palaeolithic archaeology, as it was here that Boucher de Perthes demonstrated the antiquity of humankind in the 1840's. Investigations in this valley over the last 160 years has produced



A Working Group of the HEADS team for Eurasia in the Fürstenzimmer of Castle Hohentübingen © WHC UNESCO/Nuria Sanz.

one of the best geological sequences in Europe for the Middle and Upper Pleistocene, and large numbers of Late Middle and Middle Palaeolithic sites.

There are also two groups of sites that could be grouped for a serial nomination. The first are those with evidence of ***Homo heidelbergensis***, which was the resident Middle Pleistocene hominin in Europe and the ancestor of Neanderthals. The principal sites that have produced skeletal evidence are **Mauer**, where the type specimen of *H. heidelbergensis* was found in 1908; **Steinheim** (Germany), **Swancombe** (UK), **Tautavel/Arago** (France), **Petalona** (Greece); and **Sima de los Huesos, Atapuerca** (Spain; and already on the World Heritage List).

The second group are those sites with evidence of Neanderthals. In the last glacial period prior to c. 40 Ka, these lived in all of Europe south of Scandinavia, and eastwards into Israel, Iraq, Iran, and much of Siberia. The principal sites with Neanderthal remains are **Forbes Quarry** (Gibraltar); **La Ferrassie, Le Moustier** and **La Chapelle-aux-Saints** (Perigord, south-west France); **Spy** (Belgium); **Feldhofer Cave** (Germany) (where Neanderthals were first recognised as an extinct species in 1856); and **Krapina** (Croatia). Related ones in south-west Asia are those at **Tabun** and **Kebara** (Israel) and **Shanidar** (Iraq); and **Teschik Tasch** (Uzbekistan).

### *c) The arrival and spread of H. sapiens (Late Pleistocene; Late Middle/Upper Palaeolithic).*

There are several groups of sites that could be considered in the future as serial candidatures:

**Kostenki-Borchevo**, western Russia: this is an incredibly important cluster of c. 40 upper Palaeolithic sites that provide an almost complete cultural sequence from 40 Ka to 10 Ka. It was discovered in 1879, and excavations here in the 1920's pioneered the techniques for detailed excavations of open air Palaeolithic sites. In addition to its complex cultural record of stone and bone artefacts, there are numerous examples of structures, hearths, mobiliary Palaeolithic art, and recently, the ancient DNA from an individual that died 36,000 years ago. The importance of these sites is hard to over-estimate.

**Pavlov sites (Pavlov, Dolni Vestonice)**, Czech Republic: this comprises a cluster of sites around the villages of Pavlov, with at least 6 known Palaeolithic sites, and Dolni Vestonice, with at least two sites. The main occupation period dates to c. 29-25 Ka. Besides the evidence for structures and a distinctive material culture (the Pavlovian), the evidence include a unique triple burial at Dolni Vestonice, and some of the earliest evidence for textiles and burnt ceramics,

**Swabian Caves**, Germany: this is another exceptionally important cluster of sites in the Asch and Lone Valleys of the Swabian Alps, and contains long Middle and Upper Palaeolithic sequences. It is particularly noteworthy for its examples of early sculptures and music. The principal sites are **Vogelherd**, which has produced some of the earliest and loveliest Palaeolithic animal figurines c. 33 Ka-old; **Geissenklösterle**, which has the world's earliest flutes, the famous Venus of **Hohle Fels** (c.38 -33 Ka); and the unique statue of the Lion Man from **Hohlenstein Stadel** (c. 38 Ka).



A Working Group of the HEADS team for Eurasia in the lecture hall for Early Prehistory and Quaternary Ecology of Castle Hohentubingen © WHC UNESCO/Nuria Sanz.

**Wachau sites (Willendorf I and II, Aggsbach)**, Austria. This group of site can be regarded as outlier of the Pavlovian sites in the neighbouring Czech Republic. **Willendorf** is best known for its 'Venus' figurine, dating from 25-28 Ka. Pleistocene geologists also know this area well because of its high-quality palaeoclimatic record for the last glacial cycle.

Various other clusters of sites, or individual sites, were also proposed as possible candidates for inscription. Three focused on the late glacial period. These included those in the Paris Basin, with the large and important late Magdalenian camp site of **Pincevent**; the late glacial sites of **Gönnersdorf** and **Andernach**, near Neuwied, Germany, famous for their structures, engravings and figurines; and those in the **Neuchatel** area of Switzerland, with sites such as Hauterive-Champveyres, the caves of Kesslerloch and Schweizersbild, as well as large open-air campsites like Monruz and Moosboöl.

In occasion of an international meeting, *Les Hominidés du Pliocène et du Pléistocène inférieur et moyen dans le monde. La place de l'Homme de Tautavel, un Homo heidelbergensis, il y a 450,000 ans*, which took place in celebration of the 50th anniversary of the beginning of palaeoanthropological research in the **Arago Cave** in **France**, the world's most prominent and distinguished palaeontologists came together for a preliminary discussion on the site's Outstanding Universal Value, how they could develop the site's unique significance and how to move forward with nominating Arago Cave to the World Heritage Tentative List.



International meeting at Tautavel, France, June 2014. © WHC UNESCO/Nuria Sanz.

The **Crimean Peninsula** is another area with several important Middle and Upper Palaeolithic sites that are relevant to narratives about Neanderthal extinction and the appearance of modern humans. Sites include Kiik-Koba and Kabazi, Starosel'ye, and Ak-Kaya. Another area that was proposed was the **Altai region of Siberia**, with caves such as **Razboinichya Cave**, with evidence of domestic dog c. 33 Ka, **Okladinov Cave**, and **Denisova Cave**, the source of the Denisovans, known only from their ancient DNA. Finally, there are the '**Grimaldi sites**' of Italy, with sites such as Arene Candide, Balzi Rossi, Barma Grande and Riparo Mochi. As a 'stand-alone' proposal, **Sungir** (near Moscow, Russia) was

mentioned on account of its superlative double burial of two males with ivory spears and thousands of beads that would have decorated their clothing when buried c.30 Ka-ago.

It was evident from the discussions that several other narratives could be developed that encompass the origin, dispersal and adaptability of *Homo sapiens* in Eurasia. Although the data are variable in both quality and quantity, there is potential for developing the Middle and Upper Palaeolithic records into such narratives. Potential areas for such developments are parts of Iberia, Italy, the Caucasus and Zagros Mountains, the Upper Dnepr; northern Spain and south-west France regarding the Solutrean; Siberia, with its rich record of sites such as Mal'ta, Buret and Yana; and Lebanon and southern Turkey, with sites such as Ksar Akil, Beldibi, Belbasi and Ucagizli.



*A Working Group of the HEADS team for Eurasia at Castle Hohentübingen. © WHC UNESCO/Nuria Sanz.*

## 2) Interdisciplinary cooperation for conservation, research and curatorship

### a) Protocols for sites

In terms of interdisciplinary cooperation for conservation, research and curatorship, the Working Groups agreed that protocols for sites should be implemented. Sites constitute the locus and focus of all information, even if materials are dispersed throughout the world, as has typically happened in the past and still continues to happen today, with sample and other data ending up in international institutions or in the hands of specialists. It was emphasized that all this data are essential to archaeological sites and protocols must be put in place to properly record, curate and make accessible the data. In addition, sites should be clearly identified with coordinates. The experts suggested that an international coordinate system be established with mechanisms to integrate older, disparate coordinate systems. Whenever possible, it is important to use GIS and other database technologies that facilitate the integration and transfer of, among other things, information about sites, landscapes and objects among researchers. Additionally, stratigraphic sections and a sizeable part of the deposit must be retained at sites. The use of non-destructive techniques for site and artefact recording (laser scanning, remote sensing - geophysics on a smaller-local scale), including technologies that make use of open-access sources are recommended. Special focus was placed on digitalisation, particularly in the case of rock art sites that are at risk, with a call for efforts to be made to digitalise raw data, field notes and publications. It was agreed that raw data, field notes and publications concerning sites.

### b) Protocols for Movable Heritage

Concerning movable heritage, context is key to the value of a site (for example, metadata - notes, objects, samples and so on). Collections (movable objects, records of excavations, notes and so forth) are a fundamental part of sites and this notion should be integrated into the concept of a site and its OUV. Furthermore, the potential for site inscription should explicitly take into account the state of the excavated materials, wherever they may be. Therefore, clear, scientifically informed guidelines should be defined for the preservation of artefacts in museums (including, among others, bones, samples of sediments, specialist samples). To this end, communication should be fostered between museums and researchers concerning the optimal nature of conservation and what constitutes useful retention of materials for future researchers. Accordingly, the role of museums is an essential aspect of the preservation of sites. Protocols must be defined for the curation of materials in the long term, from the start of the planning of excavations. As such, it would be useful to provide a network framework that makes expertise of professional conservators readily available to excavators and institutions responsible for finds. With new technologies of documentation, it is less necessary to circulate original materials; the information can be circulated digitally. The use of standard protocols for archives, GIS data, geographical positioning and other numerical data formats is strongly recommended. Taking into account that collections are spread out among many different and far flung museums, records of finds should be hosted at a global level for these sites. New technologies, such as cloud technology, can vastly improve the visibility and dissemination of information to researchers and public. UNESCO's role in the process is to centralise and standardise information on an international level and create a platform for interaction with national and international researchers.

### 3) How to improve institutional cooperation standards to research in Caves - Cave Sites and the World Heritage Convention

#### a) Ethics

Cave sediments are a unique and finite resource, and the need for their preservation needs to be considered in relation to the need for investigation of research questions by excavation. (Caves here refer to caves in a generic sense, but also to rock karstic fissures, collapsed caves and artificial caves). Excavation should be, therefore, a matter of last resort and justified only by specific research questions. As cave sediments and overall context entrance can form over very long periods and preserve multiple types of evidence on past environments, they are an obvious and major archaeological resource.

Caves are not static entities but are, instead, a continuous process of active cultural and ecological processes, and archaeology should be respectful of these. Caves may evolve and even disappear (for example, Qesem) but the deposits may still be preserved.

Caves may have multiple stakeholders; they may have local economic significance (guano, fossil bone). In some situations (for instance, Australia) caves may possess spiritual or other relevance to present-day residents and their viewpoint must also be respected. Caves may have current economic significance to hunter-gatherers, pastoralists and/or farmers, and their needs should be respected. Caves may also have important ecological significance (for bats, for instance.). They may have or have cultural or iconic significance in the present for both the public and the research community. The protection, conservation and investigation of caves can therefore raise complex and sometimes conflicting demands that need to be addressed on a case by case basis. Some current practices and beliefs can help maintain the authenticity and integrity of a cave; others may have a negative impact. The guiding principle therefore, should be to support all measures by the local and research community that protect and conserve the contents of caves.

Cooperation relating to research in caves should involve speleologists, ecologists and other branches of expertise. To illustrate this point, it is worth mentioning that Sima de los Huesos (Spain) and Peshtera de Oase (Romania) have produced some of the most important human skeletal evidence in Europe, and were discovered by local amateur speleologists.

Concerning unexcavated caves, upon discussion of whether all periods of occupation should be treated as having equal significance and whether archaeologists should decide what deposits are more important than others, it was determined that, ideally, later -Holocene- deposits should be investigated with the same rigour as the underlying Palaeolithic deposits. In many situations, this is difficult when the funding for excavation requires that the pre-Holocene deposits be prioritised. In any event, it was agreed that care must be taken to document the rationale used for excavation and to provide information that can be used in at least general interpretation of other occupation levels.

As cave sediments are a unique and finite resource, it is vital to ensure that only the minimum amount is excavated so that they are still accessible for later generations. The experts convened that measures should be put in place to ensure that the circulation of visitors is regulated in order to minimise degradation of the local environment of the cave. Furthermore, it was agreed that it is paramount that cave sediments be protected against any illicit interference. Although it is not possible to protect every cave by, for example, secure gates, there should be procedures in place for regular monitoring. This work may involve other agencies, such as parks and wildlife authorities. Any investigation of cave sediments or contents should be at the highest international standards, and moreover, that that the recording, conservation and curation of excavated materials should be automatic and equally, at the highest international standards. Investigations of caves should also take into account the need to protect the long-term future of the cave as part of the local heritage and not just the immediate research objectives of the excavation. Cave investigations should also include local preservation of the cave, and the interpretive requirements for the local and wider community.

It is highly recommended that research investigations of cave sediments should also maximise the sharing of good/ successful practices to ensure the most successful and cost-effective measures for conserving remaining deposits.

With regards to caves excavated a long time ago, experts convened that re-excavation should only be attempted with clear, planned research questions and not simply to recover more material. Priority should also be given to the re-excavation of the deposits removed in their original excavation.

In terms of rescue and salvage investigations, any legislation covering archaeological programmes should also include caves and fissures. There is also a need to assess the type and degree of risk (for instance, climate change, war, earthquakes, quarrying) in situations where caves are threatened. In karstic areas, collaboration with geologists is required as they are vital partners in devising appropriate measures. Although it is rarely possible to conduct investigations at the highest



*A Working Group of the HEADS team for Eurasia in the Fürstenzimmer of Castle Hohentübingen © WHC UNESCO/Nuria Sanz.*

international standards in rescue situations, the methods used should be at the highest standard in relation to the immediate situation.

Regarding documentation, the goal is to digitalise it, making it easier to combine in a general database and thus, making it more accessible. Furthermore, this accessibility makes it easy for the public to obtain information of the location of data. Digitalised, documentation and objects, items (artefacts, environmental samples and so on) are easy to combine.

It is essential that back-ups and copies of everything that is digitalised be secured in the different responsible institutions (for example, in museums, excavators and so forth). All this digitalisation calls for decisions to be made on how to deal with the purely digitized documentation and questions such as if it makes paper documentation redundant must be tackled. The issue of what types of software must be used as well as the medium of digital storage must be addressed, as well as the paper copies of central part of documentation.

### **b) General**

Caves are unique, well-defined spatial entities, with detailed cultural-stratigraphical sequences. They provide a space of outstanding preservation for their content and are invaluable natural archives. Long-term research commitments regarding caves should take into account their volume and surfaces.

Objects recovered from caves and their corresponding documentation should be stored in one and the same archive, and security of all digital documentation (curation, software, backups and so on) should be made a priority. If the data is centralised, this location should have an emergency strategy in place and there must be secure access to data within working groups (with a common database structure and central server).

Partnerships must be formed in order to establish a shared basic standard of storage (of materials and documentation) and in the same vein, multidisciplinary studies must be harmonised and correlated. An issue to be addressed is the longevity of the inscription of artefacts.

Explicit recommendations are required in order to deal with different standards (worldwide perspective/partnership/support network) regarding the stage prior to excavating an untouched site. Considered essential within this context are the following: explicit research design; conservation plans (based on several sources of information and materials); long-term plans for handling the data collected; procedure/transparency/contract form documentation if samples/materials are given away; final long-term storage after field work and analysis are finished (objects and environmental data); and the cost-benefit of future excavations.

During ongoing excavations, essential are transparent modernisation of techniques and methods of documentation, integrated datasets (old and new) and a compromise between conventional and digital documentation (for example, lime-stones hand drawn, digital measurements and photographs).



*The Plenary Session of the HEADS Working Group on Eurasia at the Fabri-haus in Blaubeuren © WHC UNESCO/Nuria Sanz.*

Studying past excavations, research-design (witness blocks, *in situ* documentation - storage off-site and so forth) are considered paramount, as is the documented monitoring of what is left after an excavation (for instance, change in cave walls and so forth) and the digitalization of older documents. Before starting any new fieldwork, it is essential to analyse existing data and finds.

Salvage excavations require flexible response and pragmatic documentation. Furthermore, there is a need for partnerships and support networks, as well as data collection of sites and cartographies (especially for linear projects).

### **c) Techniques**

The techniques used in cave excavations should be ethical, and two levels of recommendations are necessary and recommended. It is important to start with ethics, continue with techniques and end with documentation. Explicit research, scientific and preservation questions and goals must be clearly outlined. Archaeologists should recognise that caves record not just human materials, but also palaeoenvironmental and landscape change information and the techniques should be appropriately selected. The first step requires non-invasive techniques, then a systematic survey/geological survey and documentation of site location. It must be followed by geomorphology carried out by geologists (a 3D scan of a cave, a geophysical analysis of a cave and the cave sediments). A 3D spatial control of the excavation (grid, total station: including free software for field documentation with total station) is needed to highlight stratigraphic excavation (arbitrary stratigraphic excavations should be avoided whenever possible, even in the case of urgency).

Excavation should be as limited as possible (it should answer the research question and the goal of preserving material for future research) and the excavators should attempt to preserve a connected stratigraphic sequence across the site. This should be supported by the geophysical data.

Essential is 3D measurement (XYZ) of all classes of artefacts and samples, and appropriate tagging and tracking of materials: bucket/abtrag method (measurement of each excavated unit), measurement of stratigraphic contacts, measurement of features, both anthropogenic and natural.

A cave's profile and features must be documented in the form of drawings, geological descriptions and photographs, and profiles and photos must be linked with 3D plots.

Geological features must be recorded, such as the strike and dip of artefacts.

When dealing with the recovery of microartefacts and microecofacts, screening should be required, and when possible and appropriate wet screening and flotation. Screen size should be selected to appropriately answer the research question.

**d) Multi-disciplinarity**

Excavations should be a multidisciplinary project and should include experts on geoarchaeology, archaeobotany, zooarchaeology, dating, archaeometry and isotopic research. Members from each specialization should be present at the site when possible and should communicate with other members of the team when sampling and analysing materials.

Useful methods that should be appropriately selected consist of:

- Geoarchaeology: Micromorphology, FTIR, sedimentology (granulometry and so forth), magnetic susceptibility, geochemistry. Examples should be collected from a wide range of methods, including blocks and loose deposits. Future methods or research questions should be considered and site formation processes should be emphasized;
- Zooarchaeology: the recovery of all size classes of faunal material, which highlights taxonomic, palaeoenvironmental, human behavioural and taphonomic analysis;
- Isotopes: faunal, human bone material, speleothems and shells, for diet, migration and climate reconstruction;
- DNA: appropriate considerations must be taken during sampling for DNA in the field to avoid contamination;
- Archaeobotany: anthracology, carpology, phytoliths, pollen and diatoms, integrated within general sampling strategy and emphasizes palaeoenvironment and behavioural analysis;
- Dating: depends on the condition of caves. Dating experts should be made part of the research group when at all possible (OSL; ESR, Palaeomagnetism, TL, U-series).

Physical anthropological analysis should be carried out on human fossils.

**d) Post-excavation**

Post-excavation, a certain portion of the research budget should be set aside for the preservation of the sequence and this should be carried out on an individual case basis.

There is a lack of expert knowledge in this field. It is thus essential to promote research of the long-term preservation of stratigraphic profiles. The overwhelming response from the Tübingen meeting is that UNESCO should sponsor a meeting on this topic, with the participation of archaeologists, geoarchaeologists, geotechnicians/engineers and conservators.

With regards to caves excavated in the past, an attempt must be made to combine past research with current and emerging research, in order to re-evaluate different aspects, such as dating, in new excavations.

Concerning urgent rescue situations, documentation and conservation must be carried out if possible. Sampling should be highlighted and excavation procedures adapted.

**Concluding comments**

The Tübingen meeting accomplished a great deal in establishing narratives of human history that could be applied to the rich Palaeolithic record of Eurasia, and also in addressing the complex ethical and technical issues concerning the investigation of the cave sites that are so fundamentally important to those who investigate and promote the study of human evolution and the Palaeolithic. The meeting built on the successes of earlier meetings in Burgos (2009), Addis Ababa (2011) and Jeongkok (2012), and was carried forward to subsequent meetings in Puebla, Mexico (2013, 2014) and Ankara (2014). As such, it was therefore a work in progress, the success of which will be measured by the extent to which the deep history of humankind is properly represented in our World Heritage.



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**Sanz, N. 2015.** Conclusions and the Way Forward.

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# Conclusions and the Way Forward

# 4

**Nuria Sanz**

*Head and Representative of the UNESCO Office in Mexico*

The international meeting *The First Peopling of the Americas and the World Heritage Convention* was held in Puebla, Mexico, from 2 to 6 September 2013. The meeting marked an important advance of the HEADS Programme towards its mission of defining and establish a strategy of cooperation with the local government of Puebla and of establishing solid actions in order to ensure the future recognition, conservation and research of sites related to the process of human evolution, adaptation, dispersal and social development in the Americas. The Americas hold many sites that have strong links to human origins and many of these are insufficiently represented on the World Heritage List. The value of these sites is underestimated and goes unrecognized, and it is often a challenge for States Parties to conserve this heritage and manage its specific vulnerability.

The meeting was a continuation of a series of World Heritage meetings; it addressed the discussions and recommendations from the international UNESCO meeting *Human Evolution and the World Heritage Convention*, which took place on 21 to 25 March 2009 in Burgos, Spain, the *Meeting to promote African human origin sites and the World Heritage Convention*, held from 8 to 11 February 2011 in Addis Ababa, Ethiopia, *Human Origin Sites in Asia and the World Heritage Convention*, held at the Jeongok Prehistory Museum, Republic of Korea, from 24 to 28 September 2012 and, most recently, *Human Origin Sites and the World Heritage Convention* in Eurasia held at the University of Tübingen, Germany, from 25 February to 1 March 2013. Whilst the meeting in Burgos focused on sites related to Human Evolution from a global perspective and analysis, this meeting provided a regional concentration in support of the future conservation of human dispersal and adaptation sites in the Americas, as was the case following the African, Asian and Eurasian meetings. Additionally, this meeting extended beyond evaluating and defining HEADS related sites and their evolutionary features and addressed the development of the compulsory cooperation between science and conservation.

This essential collaboration was highlighted by the involvement and participation of government officials from the State Government of Puebla, SEMARNAT, CONAMP, INAH and CONABIO.

Most of the meeting's work was achieved through multilateral Working Groups, which were based on information acquired from several days of scientific sessions and site visits<sup>1</sup>. The scientific sessions consisted of presentations by invited experts from Mexico and representing 11 other countries, representing over 30 universities and research centres. The experts gave presentations and engaged in discussions about the arrival and dispersal of hominids to and across the Americas. The presentations approached the first peopling of the Americas from many perspectives; experts specializing in climate analysis, human palaeontology, zooarchaeology, mitochondrial DNA, property relations, neolization, the origins of agriculture and the domestication of maize and the important role of the *cenotes* submerged heritage.

The scientific sessions were enriched by site visits. The experts visited la Reserva de la Biosfera Tehuacan-Cuictlan in Tehuacán, Puebla, Mexico, which was declared a Natural Protected Area by Presidential Decree in 1998. The valley reveals important information regarding the origins of agriculture in Mesoamerica and thus regarding the peopling of the continent. It contains key information for developing an understanding of the domestication of many species of plants (maize, chilli, amaranth, avocado and pumpkin, among others). The bioserve is also home to many endemic species, both floral and faunal. The experts also attended the Museo de la Valle de Tehuacán where the local populations of the area presented the ritual called Popoloca Ceremony.

Narratives discussed in the Working Groups include human dispersion into the continent and subsequent adaptations and social developments, such as adaptations to high altitude environments, the domestication of potatoes, maize and amaranth, the transformation of symbolic landscapes and the transformation of grassland use from megafauna to cattle ranching, time depth in living traditions and technological innovations. Other narratives discussed were human and megafaunal interactions

1 <http://whc.unesco.org/es/eventos/1077/>

and economic alternatives, plant and animal domestication and the transition from hunter-gatherers to agricultural or sedentary societies, as referenced in the last pages of the second volume of this publication.

These narratives were discussed within the contextual framework of the following criteria and concerns: current degrees of conservation, exceptional variety and chronological continuity, cultural and environmental record, and political and environmental risks necessitating international collaboration.

Among the sites discussed was Monte Verde in Chile, noted for its Outstanding Universal Value. Investigations of the site have contributed to insights into a growing body of knowledge based upon several of the aforementioned scientific narratives. The site embodies a huge temporal development, with dates as early as 14,500 years BP. The site also conveys a transcendent and significant quantity of biological, social and cultural processes related to human evolution. Technological advances are evidenced even by double-S-slip knotting. It has also been underlined the importance of the evidence of technological advances at Peru's Huaca Prieta, that includes unifaces dated 14,400 (calibrated) BP. Unifaces from Monte Verde date to 13,500-12,800 (calibrated) BP. This correlation potentially indicates dispersion patterns.

The Working Groups focused on conservation and addressed the need for enlarging sites to include the past and current use of biodiversity in surrounding areas, and also touched upon the subject of expanding conservation procedures to include local populations in the decision-making process. The idea of expanding conservation to include mobile heritage was also discussed, and it was suggested that a Technical Group be created that would look at designing a HEADS approved protocol for designing interpretive criteria for prehistoric sites, guidelines to display collections and delve deeper into the reflection on how to use criteria viii for the benefit of HEADS sites.

Discussions also considered the Mexican Tentative List for World Heritage Sites, and in particular, the case of Tehuacan/ Tehuacan-Cuicatlan Biosphere Reserve. It was suggested that the current model for the nomination process be updated to reflect the following aspects:

Suggestions in order to begin the nomination process of this site within the collaborative nature and framework of the HEADS Thematic Programme include eliciting a meeting between mayors and state governmental entities to generate dialogue as reflected in the participation of members from the SRE, SEMARNAT, CONANP, INAH and the Governor of the State of Puebla of the Presidium of the opening ceremony of the meeting.

It is acknowledged that the HEADS Thematic Programme may provide the knowledge, international experience and resources necessary for the generation of expert technical working committees in order to advance the nomination process. This publication could be used as a tool to provide the elements for the comparative study of sites.

## Results of Working Groups

### GROUP 1: The Americas (I)

The first Working Group's discussion on multidisciplinary Approaches of Colonisation and Dispersal was guided by Dr Robin Dennell. The participants who contributed to the dialogue were Dr Tom Dillehay, Dr James Chatters, Dr Dennis O'Rourke, Dr Nelson Fagundes, Dr Luis Alberto Borrero, Dr James Steele, Dr Eduardo Corona Martinez and Dr Joaquin Arroyo.

#### Main narratives for the Americas

- i. Archaeological studies (i.e. skeletal record)
- ii. Geoarchaeological processes
  - a. Caves
    1. Little Fish
    2. Bute
  - b. Rock shelters
    1. Pedra Fourada 2
  - c. Cenotes in Yucatan
- iii. Genetic-archaeological-geomorph-climatic studies (i.e. identifying landscape usage)



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- iv. Integration of genetic record of modern humans, aDNA and archaeological evidence
  - a. Modelling and reconstruction of past environments in relation to the timing of colonization, namely:
    1. Beringia
    2. Panamanian isthmus
    3. Brazilian rainforest
- v. Isotopic analysis
- vi. Palaeoecological research
  - a. Megafaunal/ human and megafaunal interaction



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#### Subsequent Adaptations

- i. Economic shift from sealing to whaling
  - a. Dorset to Thule (Arctic North America)
- ii. High altitude adaptation
  - a. In the archaeological sites of Peru and Bolivia
- iii. Movements across the Andes
- iv. Modifications of human biology
- v. The domestication of the potato
- vi. Transformation of grassland use by megafauna to cattle ranching as in the cases of Argentina.

#### Social Developments

- i. The evolutionary role of food storage
  - a. Population growth and domestication
    - i. North-west coast
- ii. Symbolic landscapes
  - a. Intercommunity development of public landscapes, geoglyphs
    - i. Pecos River area (USA)/ Coahuila, Nuevo León and Sonora in México.
- iii. Sedentism/villaje emergence, population aggregation
- iv. Evolutionary role of deferred or delayed return in economics
  - i. North-west Plateau
  - ii. Columbia/Fraser River
- v. Time depth of living traditions
  - i. Use of grasslands
  - ii. North-west coast
  - iii. Riverine environments
  - vi. Technological innovations
    - a. Clovis/Folsom
    - b. High altitude corrals (camelids)
    - c. Transition from coastal hunter-gatherers to sealing and to whaling

#### GROUP 2: The Americas (II)

The second Working Group's discussion guided by Dr Francois Sémah. Dr Mark Rohrig Hubbe, Dr Daniel Sandweiss, Dr Christopher Scarre, Dr Theodore Schurr, Dr Rafael Suárez Sainz, Dr Francisco Mena, Dr Augustin Holl, Dr Adriana Schmidt Dias, Dr Fernando Fernandez and Dr Guillermo de Anda Alanis participated.

#### Scientific Narratives related to specific sites:

- i. Human dispersion into the continent
  - a. South-east Alaska, USA
  - b. Monte Verde, Chile
  - c. Nacientes del Río Catalanes-Arapey, Uruguay
  - d. Channel Islands, California
  - e. Clovis Site, New Mexico, USA
  - f. Lagoa Santa, Brazil
  - g. Santa Elina, Brazil

- h. Quebrada Jaguay, Peru
- ii. Human/megafauna interactions and economic alternatives
  - a. Lagoa Santa, Brazil
  - b. Monte Verde, Chile
  - c. Las Breas de San Felipe, Cuba
  - d. Head Smashed In Buffalo kill sites (1981, vi)
  - e. Quebrada Jaguay, Peru
- iii. Plant/Animal domestication/ Transition from Hunter-Gatherers to Agricultural/ Sedentary Societies
  - a. Tehuacán, Mexico
  - b. Huaca Prieta, Peru
  - c. Telarmachay, Peru
  - d. Oaxaca Valley, Mexico
- iv. Adaptation to extreme environmental conditions
  - a. Pucuncho Valley, Peru
- v. Evidence of the rise of social complexity
  - a. Brazilian shell mounds
  - b. Huaca Prieta, Peru



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#### Criterion

- i. Exceptional Conservation
  - a. Monte Verde, Chile
  - b. Peruacu Valley, Brazil
  - c. Cenotes of Yucatan, Mexico
  - d. Lagoa Santa, Brazil
- ii. Exceptional Variety and Chronological Continuity
  - a. Huaca Prieta, Peru
  - b. South-east Alaska, USA
- iii. Cultural and Environmental Record
  - a. Pucuncho Basin, Peru
- iv. Necessity for international collaboration
- v. Environmentally and Developmentally Endangered

#### Some exceptional sites and regions were considered to shape some of the identified cultures:

- i. Pucuncho Basin, Peru
  1. Earliest high altitude site
  2. Significant palaeoclimatic and palaeoenvironmental records (glacial deposits, ice cores)
  3. Traditional but low density occupation (alpaca herders)—low threat
  4. Ongoing interdisciplinary research
  5. Obsidian: exploitation of key natural resources
  6. Linked to Puchuncho Basin by obsidian: Quebrada Jaguay
- ii. Lagoa Santa Region, Central Brazil
  1. Longest history of research
  2. Ongoing interdisciplinary research
  3. Early human collections
  4. Palaeontological quaternary knowledge in the Americas.
  5. Endangered by mining
  6. 1844: First suggestion of human coexistence/ interaction with megafauna
- iii. Uruguay Middle River Basin
  1. Transnational collaboration: Brazil, Uruguay, Argentina
- iv. Mexico, Oaxaca Valley
  1. Neolithic revolution
  2. Settlement type shifts
  3. Well-documented climate sequence
- v. Huaca Prieta, Peru
  1. Longest archaeological sequence

2. Important for the history of plant domestication/ agriculture
3. Fishing practices documented
4. Rise of social complexity (i.e. rituals)
- vi. Cave Sites (Early underwater cultural heritage), Yucatan Peninsula, Mexico
  1. Long human occupation 10/ 12 ky cal
  2. Exceptional preservation
  3. Human and palaeontological record
  4. Extreme environment
  5. Ecologically unique
  6. Potential for transcontinental collaboration
  7. Association with the contemporary Maya culture
  8. Palaeoclimatic changes
  9. International importance of reservoirs of fresh water
- vii. Las Breas de San Felipe, Cuba
  1. Latest megafauna in Americas (associated with archaeological remains)
  2. Geographical dispersions linking Yucatan and Mexico
  3. Insights into palaeoclimate in the Caribbean overlap.
- viii. Brazilian shell mounds (Sambaquis)
  1. Dates 8000-2000 PB (radiocarbon)
  2. Largest shell mounds on planet (over 900 recorded)
  3. The beginnings of ceramics
  4. Coastal development
- ix. South-east Alaska, USA (Tlingit, Haida, Eyak)
  1. Migration knowledge
  2. Living cultures present
  3. Riverine movement, oral histories
  4. Climatic and environmental research
  5. Transcontinental contact
- x. Catalanes Nacientes of Arapey Archaeological region (North Uruguay)
  1. Caves and rockshelter with early occupation (c. 10.000 BP)
  2. Stone structures (cairns and circles)
  3. Lithic resources – quarries and workshops of silicified sandstone, agates, opal and jasper.

### GROUP 3: Conservation

The third Working Group's discussions were guided by Dr Margherita Mussi. Its expert contributors were Dr Fred Smith, Dr José Concepción Jimenez, Ms Suzanne Villeneuve, Dr Brian Matthew Kemp, Dr Jorge Ríos Allier, Dr Marcia Chame, Dr Felisa Aguilar, Dr María de la Luz Gutierrez Martinez and Dr Pilar Luna Erreguerena.

The discussions covered the following subjects:

#### Framing data into policies

- i. Development of international interoperable database system to integrate movable and immovable heritage of the prehistoric sites.
- ii. Increased biodiversity in the surrounding area
  - a. Volcanic area (Tres Vírgenes Volcanic System, Baja California Sur), source of pigment/obsidian (symbolic, ritual and chronological importance), among others
- iii. Methodology to articulate cultural and natural heritage management for rock art sites:
  - a. Baja California Sur
  - b. Sierra de San Francisco, Mexico (already inscribed on the World Heritage List; 1993, (i)(iii))
  - c. Sierra de Guadalupe

#### International reflection on the integrated preservation of bones

- a. Promote deeper reflection on the Anthropocene, as discussed by scientist and reflect on the implications for the HEADS project.
- b. Procure guidelines that are \_\_\_ for genetic analysis



**Group 4: The Mexican Tentative List for World Heritage Sites: the case of Tehuacan/ Tehuacan-Cuicatlan Biosphere Reserve**

The fourth group's discussions were led Dr Nuria Sanz. Participating professionals were Dr Antonio Gilman, Dr Jose Francisco Ortiz Pedraza, Dr Juan Manuel Vicent, Ms Maria Pia Gallina, Mr Fernando Reyes Dlores and Ms Cecelia Hernandez.

**The Recommendations formulated to begin the process were:**

- i. To elicit a meeting with mayors and state governments to generate dialogue
  - a. Tehuacan, Coxcatlán, State of Puebla, State of Oaxaca
  - b. Secretary of SEMARNAT, commissioner CONANP
- ii. To carry out training of technical groups:
  - a. biological
  - b. cultural
- iii. To develop a detailed cultural and natural cartography of the site
- iv. Research should be focused on the archaeology of landscape and cultural occupation in the different stages of the establishment of cultures found in the Valley over 10,000 years
- v. To generate a detailed map using GIS technology including land use, erosion, the distribution of plant species in the soil, groundwater, land, etc.
- vi. To update the MacNeish studies with the implementation of new technologies.
- vii. The first site of the domestication of maize is known; but it is necessary to raise awareness of the importance of the genetic heritage of maize and its related cultural preservation.
- viii. A social development plan is necessary, including the implementation of standards of living according to the combines efforts of the local people to the traditional use of biodiversity.
- ix. To assist the relevant government bodies responsible for agrodiversity in the country, such as CONABIO and SAGARPA.

While this publication is going to press, the candidature of the site has been submitted to the World Heritage Centre for evaluation. We thank the Federal, State and Local Authorities for their commitment and engagement as proof of the outstanding value of this HEADS meeting on the Americas. No better conclusion could be achieved.





**Sanz, N. 2014.** New paleoanthropological paradigms to explore Human Evolution in Asia within the framework of the World Heritage Convention.

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## New paleoanthropological paradigms to explore Human Evolution in Asia within the framework of the World Heritage Convention

**Nuria Sanz**

*General Coordinator of the World Heritage Thematic Programme HEADS – World Heritage Centre, UNESCO and Director – UNESCO Office in Mexico*



*2012 Human Origin Sites in Asia and the World Heritage Convention (Yeoncheon, South Korea). © Kidong Bae*

### Looking Forward

At this time the reader will be able to use the knowledge contained in the preceding works to trace the route of mankind's long journey from Africa to the continental and island regions of Asia. The contributions of this volume have demonstrated the value of international and interdisciplinary cooperation; their success serves as a call for a greater emphasis on international standards of practice in the implementation of further projects in the region. The World Heritage Convention offers a platform for the preservation of the Outstanding Universal Value of these precious repositories of knowledge, both as fixed places on the landscape and through the movable heritage which serves as an integral part of human evolution research and public outreach.

As a continent, Asia contains the highest and lowest places on earth, and an enormous diversity of biotic systems. South and East Asia are also regions in which the monsoon has been registered since 25 Ma. Some of the longest terrestrial climatic sequences have been found in East Asia due to favorable taphonomic processes of loess deposition and paleosol development.

Asia shows an extensive array of regional palaeolithic patterns thanks to improvements in excavation methods and applied research strategies. This issue, according to the majority of the approaches presented, is in favor of polycentric models for the evolution of human behavior. This book also shows the importance of the re-excavation of sites, including the sites related to paleoanthropology already inscribed on the World Heritage List, their role for further research for the understanding of human biology and cultural evolution in Asia, and Asia's huge potential for future exploration.

Moreover, these pages give solid arguments for the need of further international cooperation on the creation of new programmes, the digital archiving of fossils, the application of new technologies to preserve the conditions of authenticity and integrity of movable data on paleoanthropological sites, and the development of joint research international programmes for unspoiled paleolandscapes as in the case of Nihewan Basin in China. Future cooperation is equally needed to publish the results of scientific excavations in the English language in order to integrate a comprehensive community of interest.

The contributions presented here demonstrated that the Movius Line as originally formulated is no longer a boundary which divides two different palaeolithic cultural territories. These papers prove human presence in Southwest Asia as early as 1.85 Ma and in North China as early as 1.66 Ma. However, our knowledge of subsistence patterns is so far limited, because human fossils are fragmented and not often related to faunal or lithic assemblages (nor often are these related to each other), which creates difficulties in interpreting the data.

In palaeoanthropological terms, Asia is like an extraordinary mosaic of different landscapes, climates, types of sites, and types of evidence.

## Dispersals

Of particular interest in the case of the Asian narratives elaborated in this volume is the source of early populations and the specific regions of their initial arrival in the vast expanses of Asia. Though the traditional Out of Africa theory of the peopling of the world is generally accepted, recent evidence from Asia has called the validity of this model, in its current form, into question. Is Africa the source of early Asian populations? Were these initial settlers part of a homogenous group that subsequently split into diverse regional groups, or did this diversification precede population movements into Asia?

Since the late 1980s, findings in the Arabian Peninsula, Georgia, China, India, Pakistan and Indonesia, have begun to change our vision and perception of the role of Africa in the context of human evolution and human movement into Eurasia. New discoveries quickly posed two questions: how and when did *Homo*



*The Houjiayou site, Nihewan Basin, China. This site has been excavated since 1974, and 7000 artifacts, many mammalian bones and human fossils were found. © UNESCO / N.Sanz*

*The Nihewan Basin, looking towards Xiaochangliang. © UNESCO / N.Sanz*



*habilis* first leave Africa? And more importantly, did *Homo erectus* originate in Asia? We must endeavor to fill the gaps that remain in mapping the routes of dispersal and migration in Asia, including Pleistocene evidence from across the Indo-Pakistan geographical area.

Furthermore, the scientific dating of the Sangiran sites, where important fossils were found in the 1930s, has placed the early chronology of human presence in Indonesia at the unexpectedly early date of *at least* 1.6 million years ago. Current and ongoing research at Sangiran will continue to clarify any doubts about this early chronology. In China, work is being done



Lacustrine sediments at Xiaochangliang, Nihewan, ca. 1.36 Ma. © UNESCO / N.Sanz



with the Longgupo fossils to identify the correspondence between the skeletal remains and the lithic artifacts, in order to provide evidence of the presence of humans in China at the beginning of the Pleistocene, as is also being done in the case of Nihewan, Yuanmou, and other regions of China. In addressing some unresolved questions, the Dmanisi site in Georgia confirms the presence of humans outside Africa at a very early date. Evidence of *Homo georgicus* fills a gap in the hominin fossil record between *H. habilis* and *H. ergaster*. Dmanisi is proof that there was a human presence in Eurasia that was contemporaneous with the first human forms of behavior in Africa at least 1.85 Ma-ago. The evidence for lacustrine environments at Dmanisi and the slightly younger sites at 'Ubeidiya, Israel (1.0-1.5 million years old) indicate the type of viable locations for the initial dispersals from Africa. Today taphonomic investigations of site formation processes must continue at sites where important early human fossil evidence was historically collected, especially those which demonstrate the beginnings of cooperative behavior, hunting of large mammals, the use of fire and major technological developments.

What is clear is that once populations had moved into Asia, they expanded and dispersed throughout the region in a number of ways, utilizing a number of different routes and occupying a variety of ecological niches. The various manifestations of these early occupations of diverse ranges and environments remain to be completely understood, as does the exact role that ecology plays in the migration and diversification of early populations. This will, no doubt, lead to a variety of narratives for the various geographic and environmental zones occupied during the first migrations. New questions have arisen from the emerging evidence of the effects of Asian geography on the mobility of populations and the diversification of adaptations to a wide range of ecological niches. These are in part related to the findings of artifacts as early as 1.66 Ma in northern China. These are contemporaneous with the earliest Indonesian *Homo erectus* specimens, but evidently survived under harsher climatic conditions at a very early moment in human evolution. Although the preceding chapters have addressed some of the issues of the multiregional evolution of the Asian contribution to the study of the evolution of *Homo erectus*, and thus also of the diversity of hominids in Lower and Middle Pleistocene Asian biogeography, the picture remains far from complete.

Though we have become accustomed to gaps, both archaeological and paleoanthropological, in the record of the Pleistocene occupation of continental Asia, ongoing investigations in the Loess Plateau, in southern China, Indonesia and India inspire confidence that many of these gaps in the chronology of human evolution in Asia will be filled.

Houtouliang, 13ka B.P, Nihewan Basin. This site contains microlithic industries and some of the earliest pottery in North China. © UNESCO / N.Sanz

The sites of the Nihewan Basin (Majuangou III, Xiaochangliang and Donggutuo, 1.66 Ma, 1.36 Ma and 1.1 Ma respectively) in the north of China reinforce arguments in favor of human presence in these latitudes considerably earlier than 1 Ma. After 1.5 Ma, the Acheulean technocomplex, characterized by large bifaces, cleavers and large cutting tools, is found in Southwest Asia and later in South and perhaps East Asia, but never wholly displaced the simpler Oldowan-type technology in many regions of Asia. This evidence paints a complex and varied picture of the ranges of the initial human occupation of Asia, its cultural traditions as well as subsequent population migrations and dispersals.

Indeed, following the initial peopling of Asia, the next major narrative in terms of human evolution in Eurasia is the emergence of *Homo sapiens*. The mechanisms of this emergence remain hotly debated, with new and emerging evidence adding much needed data to these discussions. New fossil and genetic data may clarify whether *Homo sapiens* arrived in Asia as a colonising species that moved eastward into the region, or whether it was an *in situ* development. If *Homo sapiens* arrived as a colonizing population, where did they come, whom did they replace, and from and which routes did they use? If they emerged *in situ*, current genetic trees need to be clarified. In both cases the extent of population replacement and hybridization remain shrouded in mystery. We know the end result is a homogenous (i.e. single species) population of *Homo sapiens* but what diversifications and regionalization, what expansions and contractions occurred during this evolutionary process? Was it, in fact, a process, or could it be more accurately classified as an event? For example, HEADS appreciated how despite the temporal differences between 1.6 Ma and the first *H. erectus* of Zhoukoudian ca. 600 ka, the basic morphologies of the skeletons are very similar. However, this does not necessarily provide testimony of a single lineage. Neither do we know exactly how to draw the structure of the evolutionary tree or its branches, which would permit us to arrange the scattered evidence and identify the significance of evidence which, on its own, cannot explain the complexities of the processes that have taken place. For example, researchers currently estimate the existence of several human lineages around 300 Ka, hypothesizing different forms of hybridization rather than population replacement. There are certainly more questions than answers in this emerging narrative, but new fossil and genetic evidence from Asia is adding new insights which are reshaping many of the traditional paradigms of migration and dispersal.

## Biological Adaptations

However these prehistoric populations emerged or arrived upon the scene, groups subsequently underwent many adaptations to the novel physical and social conditions they encountered. Evidence of biological adaptation comes from two primary methods of analysis, genetic data from ancient and recent DNA studies along with morphological investigations of fossils. As a response to the occupation of varied environmental and geographic ranges, often more extreme than those from which these populations originated, early *Homo* populations in Asia adopted a variety of biological adaptations. These include responses to environmental change and the availability of resources, including adaptation to both long and short-term variations creating favourable and unfavourable environments (i.e. changing sea levels, climatic downturns, etc.). Closely tied to questions of the emergence and spread of *Homo sapiens* groups in Asia are narratives related to biological adaptations, such as demographic growth, population contraction, hybridization, replacement and extinction. Biological adaptations developed in response to environmental change and the availability of resources (short and long-term, sea levels, seasonality, etc.), that may have been useful in indicating which environments were adaptive, and which were unfavourable. As elaborated in the earlier works of this publication, the particularities of the Asian archaeological record are especially apt to highlight issues of demographic growth, contraction, hybridization, replacement and extinction and, notably, the role of isolated populations, given the high number of islands in East and Southeast Asia, as well as the diversity of environments found throughout the region.

## Behavioural Adaptations and Social Developments

People also adopted several behavioral adaptations to contend with the various new ecological niches and geographic areas they came to occupy. This includes novel subsistence patterns, technological innovation and variations in seasonal mobility and the origins of symbolism. Subsistence patterns would be adapted seasonally and to the movement of game, thus affecting aspects of diet, hunting, collecting and processing, both temporally and across regions. Similarly, settlement and mobility would vary from region to region in accordance with the availability of materials. Notable technical narratives in Asia involve the domestication of fire and aspects of pyrotechnology, technological developments in procuring and processing resources, and the utilization of plants and organic materials. Perhaps most dramatic is the narrative of the origins and the use of symbolism among these early settlers. In this matter, Asia is still not a well-known sphere of knowledge.

No doubt some of the same factors that spurred biological change are likely to have also resulted in changes in behavioural patterns. For example, changing environments and resource availability are likely to have affected subsistence patterns (diet, hunting, collecting and processing), including shifting the focus to marine resources. This would also have affected how the landscape was used, and the location of sites. Mobility and settlement changes would also have been closely linked to local and exotic raw materials and networks of exchange. Technologically, the emergence, spread and settlement of *Homo sapiens* is accompanied in many regions by a shift to blade and bladelet based assemblages, alongside in some cases the persistence of cobble and flake based industries. There is an increase in organic artifacts and an emergence of ground-stone and pottery technologies. Furthermore, there is evidence for innovations in pyro-technology and seafaring, most notably the colonisation of Australia after 50 ka and Japan after 40 ka. Finally, there is the development of more complex and more advanced social structures, communications and early symbolic forms, such as ornaments, burial, rock art and the use of pigments.

Whilst many of these narratives apply to human evolution in Asia, they are also applicable in a variety of regional human origin contexts in Africa and Europe. Nevertheless, some aspects of these narratives are unique to the Asian context. These include the biological and behavioural evolutionary trajectories of isolated populations; adaptations to high altitudes and, in particular, subsequent Palaeolithic adaptations, including the role of seafaring, the persistence of certain technologies, such as the role of biface lithic industries, and the development of new technologies such as micro-blades and the early use of pottery.

Just as Asia presents novel archaeological manifestations of the processes that are well known in other regional archaeological records, so must the theories and models used to explain these novel Asian manifestations be adapted or created for the particularities of the Asian record. Perhaps most dramatically, in Asia we do not find the same patterns of material culture in the expression of the first symbolic behavior that we find in Europe or Africa. For example, there are karst landscapes but no Paleolithic cave art, and currently very little evidence of portable art and musical instruments have been found. There are ornaments, but they have a minimal presence in the record compared to the florescence of such similar behaviors seen in the European Upper Palaeolithic. Excepting the possibility of a lack of preservation of the symbolic record due to taphonomic circumstances, there is no known explanation for the variation in the expression of symbolic behavior; if it is not a question of physical capability or access to suitable materials, the explanation must lie elsewhere.

Similarly, Asia presents a new variation for Upper Palaeolithic settlement design and dynamics. The Asian evidence does not follow the sequences and patterns in lithic industry that are demonstrated in other geographic regions such as Africa or Europe. Notably, the ability to apply conceptual models of the characterization of the transition between the Middle and Upper Palaeolithic from these well studied regions remains a gap in our knowledge of Asia. The works of this volume have demonstrated the necessity of considering previous transitional models, developed with a basis in the archaeology of other regions, critically when seeking to shed light on the processes evidenced in the Asian archaeological record.

Furthermore, despite our increasing ability to discern biological and behavioral adaptations in the archaeological record, it remains difficult – particularly in periods of population transformation, displacement and dispersal – to correspond human lineages with specific behavioral adaptations. For example, as recently as 40 ka, populations in Asia were composed of anatomically modern humans coming from Africa, Neanderthals who had occupied western Eurasia, Denisovans (defined genetically, not morphologically) in Central Asia and Siberia while *Homo floresiensis* persisted in Indonesia. Members of these species (apart from *H. floresiensis*) populated two, and perhaps three continents and today create conflicts of interpretation in the absence of resources to articulate the archeological debates and discussions with other sciences to explain the different contexts of human behavior. Keep in mind also that this uncertainty is amplified at greater time depths when populations were even more diverse, and taphonomic processes have resulted in the preservation of a highly fragmentary archaeological record. What does remain certain is that there is much work yet to be done, and the contributions to this volume have provided some insight into the ways in which the World Heritage Convention may be one such resource to promote interdisciplinary and interregional collaboration to begin to fill the gaps in the story of human evolution in Asia.

## The World Heritage Convention and Human Evolution in Asia

Though the World Heritage Convention was not conceived specifically with palaeolithic and human evolution sites in mind, application of its criteria proves to be a boon to potential for collaboration and conservation at these precious and finite sites. The most frequently applied criterion for currently inscribed human evolution sites is criterion (iii), which speaks to the recognition of the exceptional nature of any human evolution site which has survived thousands or millions of years to the present day. Variably, the other cultural criteria are applied to human evolution sites, but there is particular potential in using natural criteria, in particular criterion (viii), 'to be outstanding examples representing major stages of earth's history, including the record of life, significant on-going geological processes in the development of landforms, or significant geomorphic or physiographic features', to be applied to the record of the emergence of modern human biology and behavior on the earth. This recognition of the fact that very earliest, innovative and ongoing manifestations of the processes which ultimately define



our humanity originate in the natural world, speaks directly to the mandate of both the HEADS Thematic Programme, and the pursuit of human evolution research in general.

A broader inclusion of human evolution sites in the framework of the World Heritage Convention facilitates the creation and application of higher standards of conservation and preservation at these sites. In particular, the use of interdisciplinary research implementation, particularly in cases concerning sites/movable heritage, protocols for intervention and the support of new technologies for prevention, diagnosis, intervention, monitoring and museology. From the outset of any planned intervention, these factors should be taken into account and foreseen by an interdisciplinary team.

In the framework of the HEADS Thematic Programme, and in Asia in particular, specific protocols have been considered for working with descendent communities. Standards for intervention should be established, and resources significant to all stakeholders should be determined, taken into account and constantly monitored throughout all stages of intervention.

In order to ensure the Outstanding Universal Value of these sites the scale of the site, cultural values, moveable cultural heritage in coordination with properties, protocols of intervention to avoid degradation and loss of significance, and curation and museology must be considered, with attention to balancing the need to remove artifacts and sediment from the site to harness the full potential offered by the deposits, and the need to conserve certain stratigraphic sequences intact for future generations. Excavation at a site should add to the understanding of a site's significance. This concept of conservation should be used as a guiding axiom of pre-excavation planning: to excavate only as much as is necessary, but as little as possible. Thus there should be plans in place to preserve, at the very least, witness sections and areas of undisturbed sediments. This will ensure the opportunity to reassess the significance of the property in the future as research questions and scientific methodologies advance; as new technologies and methodologies are developed (i.e. ground penetrating radar, aerial photography, GIS, satellite imagery, tomography, 3D scanning, etc.), as the ability to record and sample non-destructively is ever-increasing.

By the very nature of archaeological investigation, the basic tool of the human evolution researcher, the OUV of the heritage at an archaeological site, is not always fully embodied by the elements which remain at the site; excavations should be designed to preserve the property and its archaeological context, and also the artifacts themselves once they have been excavated. The conservation of a property's movable heritage should be taken into account prior to the beginning of interventions to ensure the preservation of the full scope of the site's heritage, not just the heritage that remains geographically located *in situ*.

Furthermore, consideration of needs and appropriate methods of interpretation and dissemination should be used to reinforce the role of conservation practices. World Heritage status and OUV declaration (criteria, protection, conservation and management) should stand as the basis for the interpretation of the property in the appropriate facility (site museum, national museum, interpretation centre as well as employing various on-site or off-site modes of information transmission). Outreach, preservation and museology of this kind can be enhanced through social networking (Twitter, Facebook and by word-of-mouth). The most immediate stakeholders, the local communities, should play a guiding role in the preservation of a site's heritage, both out of respect for their contribution to the cultural value of a site and practically, as the most proximate stewards of the property. At the same time, consideration should be given to repatriation or digitalization of information of these records to be shared by museums and the scientific community and long-term loans of artifacts to ensure the conditions of authenticity and integrity of their cultural and scientific value.

The role of archaeology does not end at the physical limits of a site, but rather carries forward to the treatment, analysis, curation, presentation and interpretation of the locality and the materials it produces. The role of the World Heritage Convention at archaeological sites should therefore take into account the full scope of this process when making its evaluations and determinations of the authenticity, integrity and OUV of a human evolution site.

## Guidelines

In addressing the potential and realized scientific contribution of Asian Human Origins sites, our reflection takes advantage of the participation of numerous world renowned scholars to report on recent research efforts on Human Origins sites throughout Asia. In the following paragraphs the reader will find the results of the working groups of the aforementioned experts, in which guidelines for the establishment of scientific narratives and solid actions to ensure the future recognition, conservation and research of sites related to the process of human evolution, adaptation, dispersal and social development in the Asian geographical area.

During the meeting in South Korea in 2012, two primary narratives in Human Evolution in Asia, based on taxonomic species designation, were discussed: Early *Homo* species and *Homo sapiens*. These narratives were debated in the context of the following features: the geographical range of the species, their unique biological and behavioural adaptations in response to

changing environmental and social landscapes, and the potential for establishing the Outstanding Universal Value in each of these narratives.

### **Early *Homo*: Ranges**

With regards to *Homo* species in Asia, as in other regions, for early *Homo* species, this includes the earliest migration and settlement, the various routes used to achieve these early colonisations, as well as subsequent diffusions. Of particular interest in the case of the Asian narratives, is the source of these early populations and the specific regions of their initial arrival in the vast expanses of Asia. Though the traditional Out of Africa theory of the peopling of the world is generally accepted, recent evidence uncovered in Asia has put into question the validity of this model, in its current form. Is Africa the source of early Asian populations? Were these initial settlers part of a homogenous group that subsequently split into diverse regional groups or did this diversification precede population movements into Asia? Once populations had progressed into Asia, they expanded and dispersed throughout the region in a number of ways, utilising a number of different routes and occupying a variety of ecological niches. The various manifestations of these early occupations of diverse ranges and environments remain to be completely understood, as does the exact role that ecology plays in the migration and diversification of early populations. This will, no doubt, lead to a variety of narratives, for the various geographic and environmental zones occupied during the first migrations. The evidence paints a complex and varied picture of the ranges of the initial human occupation of Asia.

### **Further Research: Potential sites and areas**

The successful and rich discussion between scholars allowed the identification of a list of areas in Asia which should convene the increased interest of governments, technical and scientific institutions and communities.

The scholars identified a way to conform the narratives to the potential sites.

### **Potential Outstanding Universal Value (OUV)**

#### **Early *Homo* OUV**

The scholars identified the criteria to couple these narratives with potential sites:

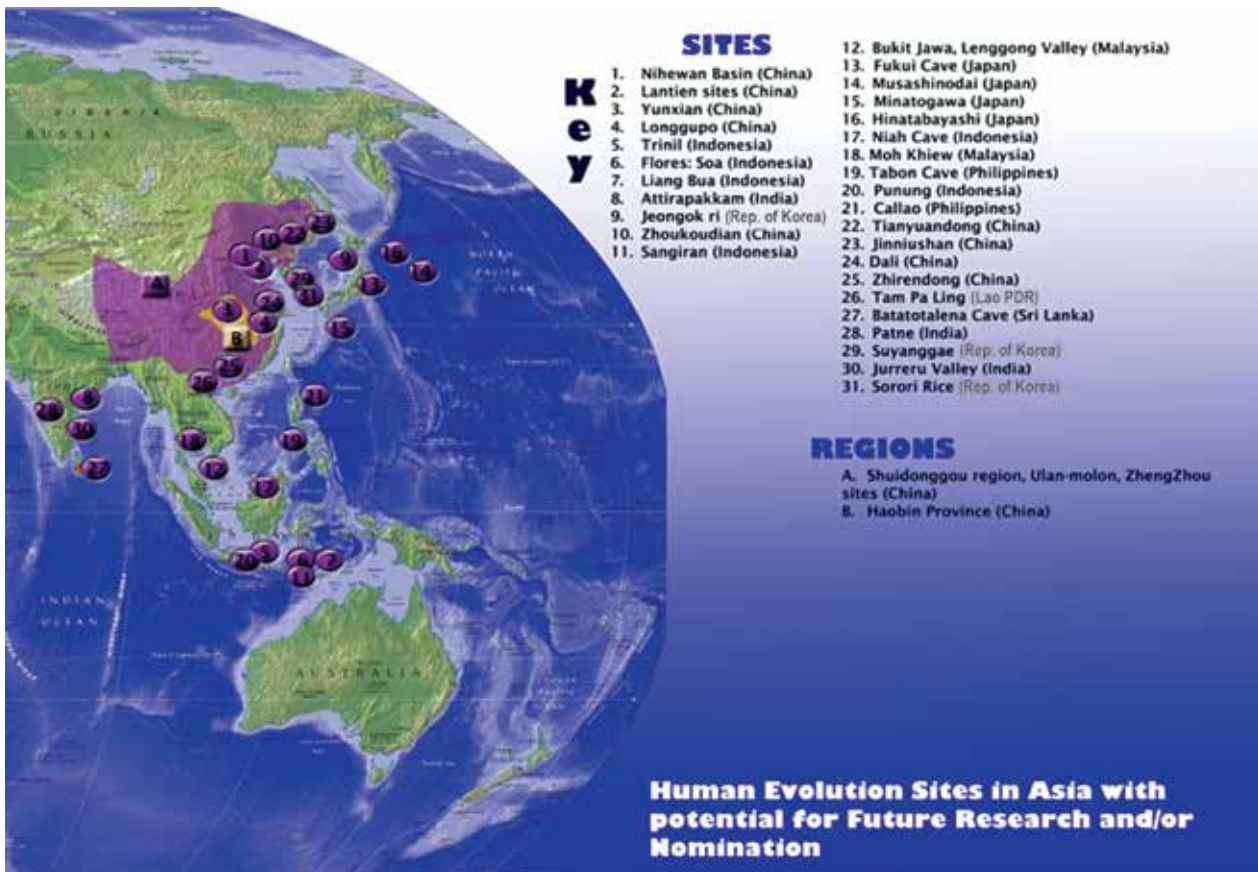
- Open temperate landscapes, for example, the Nihewan Basin, Lantian, Yunxian in China;
- Sub-tropical sites (for example, Longgupo, Yuanmou);
- Tropics (peninsular and insular) in South and Southeast Asia;
- Trinil, Java, Indonesia (particularly for its historical importance);
- Flores, Indonesia: Soa Basin, Liang Bua;
- Attirapakkam, India (in particular for its historical importance and early Acheulean industry);
- Middle Pleistocene adaptations: Baise Basin sites, China; Jeongok ri, South Korea.

#### ***Homo Sapiens* OUV**

- Shuidonggou Region, Inner Mongolia, China (potentially also: Ulan-molon, ZhengZhou sites) (additionally important for its historical importance);
- Sites showing early adaptation in Japan: Fukui Cave, Musashadai, Minatogawa, Hinatabayashi.
- Niah Cave, Borneo; Moh Kiew, Thailand;
- Tianyuandong, Jinniushan, Dali, Zhirendong, China; Tam Pa Ling, Laos etc. (Mainland):

#### **Modern *H. sapiens***

- Sri Lanka, in particular for adaptations related to modern human dispersals at Bataloma Lene and the site of Patne, India that exhibits evidence for Indian microblade technology, and symbols;
- Suyanggae, South Korea: Microlithic cultural adaptations;
- Hoabin Province: Hoabinian, etc.



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## How to Apply World Heritage Criteria to Palaeolithic Sites in Asia

### Criterion 1: “masterpiece of human creative genius”

The scope of this criterion could be broadened to explore the concept of craftsmanship within, for example, art, some outstanding handaxes and Japanese game traps, although it is noteworthy that this criterion is not directly relevant to palaeontology.

### Criterion 2: “exhibit an important interchange of human values, over a span of time or within a cultural area of the world, on developments in architecture or technology, monumental arts, town-planning or landscape design”

Because of the ephemeral nature of palaeolithic sites, this criterion is inapplicable to most palaeolithic and human evolution sites. It might however have some relevance to some late palaeolithic sites in, for example, the Levant and Siberia, but it remains predominantly valuable only when used for the most recent prehistoric past.

### Criterion 3: “unique or exceptional testimony to a cultural tradition or to a civilization which is living or which has disappeared”

This criterion is clearly useful for human evolution and prehistoric sites, a period that current scholarship focuses on the most extreme (i.e. the oldest, etc.), and for sites whose great antiquity makes the very fact of their survival an exceptional occurrence.

### Criterion 4: “outstanding example of type of building, technological ensemble”

An outstanding example of a type of building is the mammoth bone structures of Malt'a, and also Buret in Siberia. With regards to an outstanding example of a technological ensemble, examples are the earliest lithic assemblages such as Gona, Ethiopia (ca. 2.6 Ma-old) and Lokalalei, Kenya (ca. 2.3 Ma-old) and the late Pleistocene Northeast Asian microblade industries.

**Criterion 5: “outstanding example of traditional settlement, land use or sea use .... In environment vulnerable to irreversible change”**

The initial colonisation of Asia by hominid lineages, and the eventual emergence and settlements of *Homo sapiens* are an outstanding example of human achievement (e.g. Niah Cave, rainforest habitats, high altitude settlements, island colonisation, Japanese sea use for obsidian exchange, sea level changes/fragmentation of land masses in Indonesia, etc.). This criterion can be used to highlight the importance of long-term records under different environmental conditions and the establishment of behavioural traditions, such as symbolic representation and technology.

**Criterion 6: “be directly or tangibly associated with events or living traditions”**

The criterion of living traditions can be applied for sites connected to the historiography of the discipline (e.g. iconic sites such as Trinil, Zhoukoudian, Ngandong). Furthermore, caves, landscapes or any landmark that may have been repeatedly used for various purposes over time and are often significant to present inhabitants (as sacred places, graveyards, refuges, hunting posts etc., as at sites like Laang Spean cave, Cambodia) fit this criterion.

**Criterion 7: “superlative natural phenomena or areas of exceptional natural beauty”**

This criterion could be applied to palaeontology and geology that provides information on hominids, past environments and deep time scales, such as the Loess Plateau of North China, or unspoiled eroded landscapes, as in the case of the Nihewan Basin.

**Criterion 8: “outstanding examples of major stages of earth’s history – ‘Examples of groups of sites that demonstrate major episodes of earth’s history and human responses to them’”**

Though this criterion is related to natural properties, scholars have insisted in the pertinence of it for early sites of hominid colonization of nature.

Human evolution sites witnessed major episodes of the early stages of human dispersal and adaptation. These may be seen on a variety of scales or by groups of sites with common geomorphic features (e.g. basin histories such as Buning Basin and Danyang County caves). Some examples of the major stages of earth’s history witnessed by human occupation and evolution sites include: volcanism (Toba), loess deposition (North China and Central Asia), alluvial sequences (Siwaliks, Jeongok); sea level changes (Indonesia, Japan and New Guinea); massive uplift (North China, Pakistan and North India).

Thus Paleoanthropological sites could also meet natural criteria. The scholars proposed several related HEADS argumentations.

**Criterion 9: “outstanding examples of ongoing ecological and biological processes”**

Although the Convention was created with the achievements of a human group in mind, the very processes that constitute becoming human are primarily and traditionally categorised as biological (in addition to behavioural). The processes of becoming human and the sites that carry evidence of this therefore represent an outstanding and unique biological process in the record of humanity. Furthermore, the continuing ecological processes that humans react and adapt to, may speak of the relevance of this criteria to human evolution sites. For example, the development of a rain forest in the record of Niah cave; the development of the North China deserts and relevant sites (e.g. Shuidonggou and Sulawasu); human settlement in Siberia; humans in the Arctic from Yana to Wrangel in the Arctic Ocean, and manifestations of human evolution on endemic islands such as Liang Bua and Minatogawa.

**Criterion 10: “contain the most important and significant natural habitats for in situ conservation of biological diversity, including threatened species”**

Extinct species, including both those in and exploited by human lineages, provide valuable evidence of human evolution and thus should be considered along with extant species when applying this criterion. Although the animals themselves are already extinct, the information that their remains carry is a precious and limited resource, one that is often threatened by the same factors affecting extant species today (for example, Australian fauna in Cuddie Springs, for the information they can provide in the megafaunal extinction debate). Additionally, endemic island faunas can be considered to constitute a ‘time-capsule’ of biodiversity in connection with extinct hominids, as can the evidence from mainland “flag-ship” sites such as Dmanisi, Zhoukoudian, ‘Ubeidiya, and Gesher Benot Ya’aqov.

## Interdisciplinarity

The discussion on interdisciplinarity highlighted the need for its implementation, particularly in cases concerning sites/movable heritage, protocols for intervention and the support of new technologies for prevention, diagnosis, intervention, monitoring and museology. From the outset of any planned intervention, these factors should be taken into account and foreseen by an interdisciplinary team.

In the framework of the HEADS thematic programme, applied research for conservation should be developed. In Asia in particular, specific protocols should be considered for working with descendent communities. Standards for intervention should be established, resources significant to all parties should be determined and taken into account (e.g. the Burra Charter), and resources should be constantly monitored throughout all stages of intervention.

## Considerations of establishment of scientific significance

Five primary considerations in the establishment of scientific significance were formulated: scale, cultural values, moveable cultural heritage in coordination with properties, protocols of intervention to avoid degradation and loss of significance, and the consideration of curation and museology as reflecting OUV.

### (1) Scale

Considerations of scale must include the category of site (i.e. open air, underwater, cave, rock shelter, site cluster, etc.) This will define the landscape of the sites as well as the scale of survey, the limits of the property and the most appropriate techniques to be used, such as geomorphology, soil science, marine science, geophysical survey (both large and small-scale). Destructive and non-destructive survey methods can be employed, depending on the scale of the concerned area. Non-destructive techniques include those of remote sensing (i.e. ground penetrating radar, aerial photography, GIS, satellite imagery, tomography), while destructive interventions might include test excavations, drilling, trenches, the use of a backhoe to clear sterile sediments, and drilling stratigraphic columns.

The buffer zone is part of this consideration of scale and must be considered in archaeological terms. It must be large enough in terms of the conditions of authenticity and integrity of the sites. Before this determination can be made, a large scale survey must be carried out to gather enough information to accurately define the limits of the archaeological deposits. The buffer zone can be considered an 'archaeological reserve,' as it holds the potential to continue research.

The scientific quality of the property (employing criteria as appropriate), should be defined, in great part, by the degree of recognition of the site by the international scientific community (congresses, publications, peer review contributions), the existence and quality of systematic field studies (surveys and excavations) and the subsequent complete and curated documentation of the contents of the property/properties. This should include the preservation of several scales of data, including preservation conditions on a broad scale, site scale and of individual deposits. The integrity of the properties and deposits reflects the range of OUVS, the authenticity of original materials and data collected on artifact positions, site formation and taphonomy. This should be facilitated by the use of chronometric dating methods (radiocarbon, OSL, TL, U-Series Argon ESR, etc.), climatic studies (marine and ice cores, speleothems, monsoonal records, volcanology, seismic), environmental studies of both the modern (post-depositional) and prehistoric (depositional) contexts through the use of techniques and technologies such as granulometry, micromorphology, micro-fossils, pollen, and phytoliths.

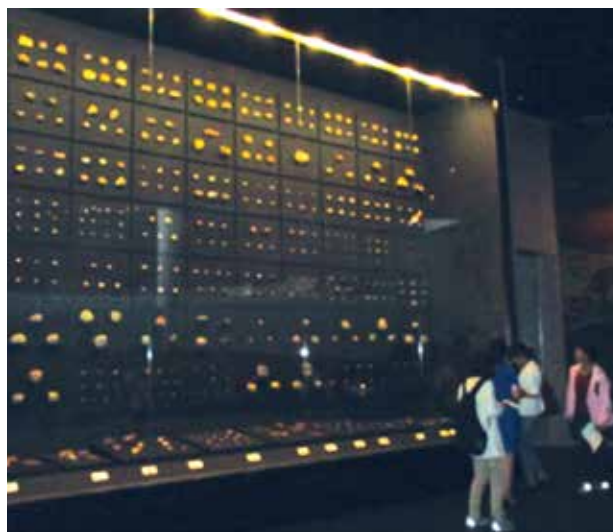
Equally important in the course of interventions is the proper documentation of the interventions themselves. A full record of the history of research and interventions (notebooks, oral testimony and memories, photographs, published sources, etc.) should be maintained to increase the physical collections for study and display by future researchers and the public.

### (2) Cultural values

In addition to the scientific value of a site for the in-depth study of prehistory, the site may also have cultural values that are important to local groups and communities living in its proximity. These cultural community values form a complimentary component to the sites heritage value. It is thus important to demonstrate a participatory collaboration process with local and regional parties in the preservation and documentation of associated intangible heritage such as oral histories and cultural practices.



Display of skulls of *Homo erectus* (copies in plaster) in Zhoukoudian Site Museum, China. © UNESCO/Nuria Sanz



Display of lithic traditions in Zhoukoudian sites. © UNESCO/Nuria Sanz

### (3) Moveable cultural heritage articulation with the property

Excavations should be designed to preserve the property and its archaeological context, and also the artifacts themselves once they have been excavated. The conservation of a property's movable heritage should be taken into account prior to the beginning of interventions to ensure the preservation of the full scope of the site's heritage, not just the heritage that remains geographically fixed. This should involve the registration of artifacts at the time of excavation, cataloguing artifacts, the assessment of conservation needs, access to the artifacts for future researchers and proper storage to ensure the preservation of the artifacts' integrity. For the latter, information about the artifacts' location needs to be obtained and secured, the artifacts need to be appropriately stored in acid-free containers. The storage conditions have to be continually monitored and responsible organizations must maintain accurate records of the data associated with the artifacts (provenience, analyses, etc.). Consideration should be given to repatriation and the loaning of artifacts to maintain the conditions of authenticity and integrity and its cultural and scientific value.

### (4) Protocols of intervention to avoid degradation and loss of significance

Excavation is considered, from the start, to contribute to the understanding of a site's significance. This concept of conservation should be used as a guiding axiom of pre-excavation planning. There should thus be plans in place to preserve, at the very least, witness sections and areas of undisturbed sediments. This will ensure the opportunity to reassess the significance of the property in the future as research questions and scientific methodologies advance.

### (5) Consideration of curation and museology as reflecting OUV

Lastly, the curation and museology of a site, and its movable heritage should be considered as part of the OUV of an archaeological site. Consideration of needs and appropriate methods of interpretation and dissemination should be used to reinforce the role of conservation practices as this provides the general public with various narratives which in turn tell a more complete story of human evolution. World Heritage status and OUV declaration (criteria, protection, conservation and management) should stand as the basis for the interpretation of the property in the appropriate facility (site museum, national museum, interpretation centre as well as employing various on-site or off-site modes of information transmission). Outreach, preservation and museology of this kind can be enhanced through social networking (Twitter, Facebook and through word-of-mouth). The most immediate participating parties and the local communities should play a guiding role in the preservation of a site's heritage, both out of respect for their contribution to the cultural value of a site and practically, as the most closest guardians of the property.



Display recording the unfortunate loss of the skulls of Beijing Man in 1941. © UNESCO/Nuria Sanz

The role of archaeology does not end at the physical limits of a site, but rather carries forward to the treatment, analysis, curation, presentation and interpretation of the locality and the materials it produces. The role of the *World Heritage Convention* at archaeological sites should therefore take into account the full scope of this process when making its evaluations and determinations of the conditions of authenticity and integrity in order to identify the OUV of a human evolution related site.



Current excavations of the west section of Zhoukoudian, Locality 1: Opening ceremony of the new Zhoukoudian Site Museum, 18 May 2014. © UNESCO/Nuria Sanz

Opening ceremony 18 May 2014, Zhoukoudian Site Museum. © UNESCO/Nuria Sanz



Display on conservation at the Zhoukoudian Site Museum. © UNESCO/Nuria Sanz



Display of the World Heritage nomination file of the Zhoukoudian site. © UNESCO/Nuria Sanz

## Final Remarks

To understand the origin of our species, the scientific committee has stated that human fossils were not enough; this publication illustrates that the *context* of these fossils, their huge geographic range, the variety of environments, the different natures of the deposits of material culture, the geomorphological data and taphonomical processes are equally important to the scientific merit of artifacts for the study of human evolution. Indeed, evolution explains the whole of life; the processes and events that define behavioral and biological modernity. A more thorough understanding of the manifestation of these processes in the past can only serve to elucidate the manner and the great diversity of ways in which they are ongoing today. As such, the study of these processes in the framework of the HEADS Programme is salient to the understanding of human roles in migration, population dynamics and protection of environment which are directly applicable to current efforts in conservation and the drawing of analogies between ancient human lineages and extant primate groups, including ourselves. This is a testament to the immediate practicality of the study of our distant past.

This publication illustrates recently made steps in the understanding of our singular anatomy, the mechanisms and complexities of our DNA as well as the patterns of inheritance which shed light on the long obscured branches of the relationships of past human lineages. These pages also describe the vast myriad of adaptations which allowed ancient humans, initially adapted to the warm, arid climates of Africa, to interact and thrive in hostile environments, with colder temperatures, novel meteorological phenomena, and previously encountered types of wildlife. It is of paramount importance that the rare and finite archaeological deposits which hold the artifacts which evidence this remarkable resilience are well-understood by current researchers and preserved for future generations.

The rapid transformation of the Earth's landscape in the present day has provided the most serious, universal and pervasive threat to the preservation of vulnerable sites and environments today. Protection against the deleterious effects of this rapid development will help to preserve the static archaeological sites as well as the dynamic environments around them. Here natural and archaeological protection form a complementary relationship. Even more so because the threatened environments are often home to primate species, our closest phylogenetic relatives. Though modern primate species have each had an equally rich history of evolution, the long-term observation of living apes, orangutans, which, for example, often wander through the Borneo canopy alone is the essential work of the primatologist and an extraordinary part of the sciences of humans, with potential as an analog (though not a homolog) to prehistoric behaviors and adaptations. Primatologists, like archaeologists, do not devote their life to descriptive natural history; their work is about testing hypotheses concerning ecology and behavior, aided by statistics, mathematical models, genetics and neuroscience. Yet these fruitful and complementary pursuits depend on preventing the extinction of our evolutionary cousins in the wild.

The determination and perseverance of my colleagues in the World Heritage Centre has been an invaluable factor in allowing this publication to reach the hands of the reader. I am most grateful to my colleagues from the Asia Unit and the Jeongok Prehistory Museum for their valuable advice. I would like especially to thank Sarah Ranlett and Anjelica Young for their dedication and expertise, as well as the HEADS Scientific Committee for making this publication possible and which today enables us to achieve a greater awareness of the work involved and the challenges faced by efforts in international cooperation. I very much hope that these pages can show us the collective potential for collaboration in Asia.



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## Africa: the origins of humankind. Towards a better representation of human evolution in the framework of the World Heritage Convention

**Nuria Sanz**

*General Coordinator of the HEADS Thematic World Heritage Programme – Chief of the Latin America and Caribbean Unit  
– World Heritage Centre, UNESCO*

In 1871 Darwin published 'The Descent of Man', in which he stated that we come from primate ancestry and that the original coordinates of this evolutionary process had to be placed in Africa (earning him the caricature of an ape in 'The Hornet', a satirical journal). Both of these assertions clashed completely with the Victorian spirit. Many decades were to pass before the necessary evidence about the processes of adaptation to the environment could be obtained and analysed, especially evidence concerning the relationship between organisms, the origin and extinction of species, and the domino effect of these fluctuations in terms of biological diversity. Since this time, the evidence discovered has become undisputed proof about evolution, although the charting of Neanderthal remains and Java Man was of some consolation to those who believed that Europe was the cradle of humanity. During the early decades of the twentieth century the Piltdown skull somewhat reassured a Europe that was unwilling to accept that the *Australopithecus africanus* discovered in 1920 could have anything to do with our evolutionary descent. Eurasia and Africa started gathering evidence from then on. Humankind's ancestor, the *Zinjanthropus boisei*, was a discovery made in Olduvai, Tanzania, in 1959. We still do not know how to position it in our genealogical tree, but from that moment on Africa undoubtedly became the epicentre of every investigation. And since then, the African continent has remained a destination for international archaeologists and paleontologists to analyse the origin of our cultures, which has continued to evolve in its own way and to radiate from there in successive waves throughout the other continents. Africa is the ancestral home of the evolutionary history of hominids over the past 7 Ma, and of the history of its cultural evidence for 2.6 Ma. Africa incontrovertibly became the most prized seat of all the developments in biological and cultural change in our history.

Africa registers the longest sequence of human occupation of any continent, which confers it with a distinctive value. To compare it with the rest of the sequences throughout the world is also crucial. This exceptional sequence represents an unparalleled and unprecedented opportunity to understand our history as a species, first as members of the hominid line and later of the genus *Homo*, and to interpret in depth our appearance and behaviour as modern humans. Africa is home to our first ascription of meaning to things.

The contributions presented here allow an unequivocal coordination of evidence on a large scale and provide an explanation of some of the mechanisms of change. Ecological pressures and technological responses, anatomical changes and cognitive abilities are all explored through this study on morphology and on behaviour patterns, not to mention the analysis of the social transfer of learning.

Man and the chimpanzee share 98.8% of their genetic heritage; 8 Ma ago their genetic patterns began to diverge. New technologies and original myths attempt to respond to a universal curiosity that looks for an explanation of our earliest moments, whether from a biological or a cultural standpoint. Over the past 20 years, 6 new fossil descendants of the human family have been found, and palynological, ethnographical and genetic knowledge has continually grown with regards to the analysis of evolutionary events and the changing environments of natural selection. From the HEADS meeting in Burgos in March 2009, Professor Toshisada Nishida's contributions to our analysis included the importance of factoring the 250 species of primates that live on Earth today into our sequence of study, and of reminding us that primates and humans have bigger brains than the rest of the mammals. This is fundamental for developing forms of social interaction and learning, manipulating raw materials, acquiring learnt behaviours and forethought, and cultivating community-family dependence. Our primate heritage explains a great deal about our place in the natural world (Potts, 2010). Bearing this in mind, it is vital to preserve their habitats in Africa today, just as Professor Nishida argued. We remember him in these pages as we reiterate our appreciation for his consistency in petitioning the international community to take a more integral approach in our analysis. We are deeply sorry for his loss.

The work of the researchers who participated in the Addis Ababa meeting in February 2011 has sought liaisons between specialities and between the technical and professional experience of their teams, resulting in an enormous amount of fossil evidence, and studies on formation, deformation, the way in which bones and teeth grew, and diets thanks to isotopic analysis, among others. Developments in genetic research and the very proliferation of archaeological material from around 2.6 Ma ago in East Africa mean that there is no lack of evidence for these disciplines to be able to develop as a whole and therefore to renew the spirit of enquiry in this research area. Studies presented here explore ways of studying behaviour patterns, the first evidence relating to symbolic behaviour 75 Ka ago, the rapprochement of disciplines to distance or discriminate between behavioural customs amongst chimpanzees and *Homo*, studies on bipedalism (a fundamental trait which separates us from our closest living relatives) and all other developments in biological evolution, group hunting, and production and use of lithic tools. With all of this, pools of knowledge can be gathered on how natural selection has operated at different moments of human evolution. This is why we need fossil records that provide evidence of adaptations and variations, but also the context in which they were discovered. Only with this synergy of content and structure can we understand how we became human, and both components are essential to be able to define a 'site' related to human evolution in the context of the implementation of the World Heritage Convention.

We do not know the nature of our last common ancestor with chimpanzees, nor do we know at what point they diverged. We do not know exactly where, how and when the first members of the *Homo* genus evolved, although undoubtedly it was in Africa more than 2 Ma ago. We possess scant and scattered evidence in Africa of apes between 12 and 8 Ma ago, and it is difficult to connect evidence found in East Africa over the past few years either with the first ape fossils or with the most recent hominids. Only after 4 Ma is there any evidence of bipedal locomotion. The first species of the genus *Homo* appear 2 Ma ago. The first hominids were able to inhabit extremely varied environments, although evidence is still very fragile, and they were able to cope with very different habitats within short distances, such as in the Afar Depression, Ethiopia, or in Laetoli, Tanzania. Although there are many questions left open, we can be reasonably sure that the answers are still to be found in Africa.

Africa has the biggest archaeological sequence on the planet, thereby constituting the whole continent with Outstanding Universal Value (OUV). For every human being, Africa signifies a journey back through our own history and a reconstruction of the itinerary. Our fossil heritage is the most common heritage of all humankind, and these pages invoke a spirit of reconnection. The earliest evidence of social behaviour, of the origins of our coexistence habits, of language and symbolic thought are all found there.



Sibudu Rock Shelter, South Africa. © University of Tübingen

In Africa, science has been claiming for cultural autonomy since 1950, as well as for originality in the processes. Africa constitutes the basis for explaining modern societies. Genetics was able to reassert Brauer and Stringer's convictions that the ancestral home of humanity is irrefutably Africa (Conard, in this publication).

The most obvious message that can be gleaned throughout these pages is the conviction that physical, cognitive, technological and climactic matters need to be cross-referenced in order to establish a justification for the OUV of places linked to human evolution, as well as to define the conditions of authenticity and integrity. I would now like to draw attention to some of the methodological contributions of the group of participants from the meeting in Addis Ababa in establishing a series of arguments on how to plot interpretative gateways between the definition of the criteria for the Convention, and the best way to adapt them to the justification for the values of sites related to human evolution.

Professor Christian Tryon's dissertation allows us to get to the bottom of the questions we need to address when using the criteria for cases of sites linked to human evolution. The geological record serves as the clef for the staff. The study of sediments acts as an interpretative context for deposition and is what can really document the time of the changes. An understanding and a study of the geological framework is vital for understanding and interpreting biological or behavioural changes, which is why it has a special role in the identification of OUV. The importance given to the geological context does not in itself imply that it has the capacity to generate an independent value, although there is no reason to rule out the fact that criteria like (viii) or (ix) could pick up tectonic or volcanic activities that could be used to date and establish sequences and developments throughout the evolution of our descent. The geological context serves as a backdrop for different contemporaneities in genera and species of hominids, as well as in the loss of this diversity, which allows us to take stock of an enormous variety of morphology without always finding explanatory clues. The difference between genus and species is essential for the study of other living organisms, and the subject is even more relevant for designating the variables in what happened in our everyday lives. Their contribution establishes that every variety has an essential role in putting together the jigsaw puzzle entitled: understanding human diversity. After putting forward arguments about the value of geology as an interpretative key, it is clear to perceive its role in terms of designating the limits of a site, and the value of the role of geological contexts in defining conditions of authenticity and integrity when we try to agree upon the definition of geological unity. In the same way, it is also vital to analyse the sedimentary environments and depositional environments where sites are found, and at the same time the imposed conditioning related to the research plan both on a superficial and a stratigraphic level. Furthermore as the geologist acknowledges the hierarchy of the litho-stratigraphic units, their observation is fundamental for all other disciplines that attempt to study the fossil record, human or otherwise. It is therefore obvious that evidence of behaviour models needs to be large scale, painted on a broad, far-reaching and multi-layered canvas. Therefore it is necessary that behavioural evidence be interpreted within geological parameters. Similarly, the site formation and variations in the deposits should be studied within a geological space and time-frame. Geological studies also enable us to show how aspects connected to the integrity of the place need to cover distances of over 10 km from the finding in order to take into account sources of supply, positional forms, etc. Mineral heritage and its dynamics have been fundamental in demonstrating the significance of places like Omo, Sterkfontein or Melka Kunture, where geological analysis has taken place, representing a full 30 years of active archaeological intervention. The geological map permits us to define limits and guarantee effective monitoring. Geological studies are essential for establishing primary geological positions and primary spatial positions, and the extent of alteration in the deposits.

In the case of chronology, we have proficiency in an enormous battery of radiometric methods, measures of isotopic decay, measuring through  $^{40}\text{Ar}/^{39}\text{Ar}$  methods and the uranium series, luminescence methods, and of more detailed readings of radiocarbon chronological techniques. The participants recommended the need to use diverse methodologies in order to acquire different technical and disciplinary readings of a site. The chronology of sediments, organic remains, lava and volcanic deposits are fundamental in the definition of the OUV, as well as for the preservation of places referenced for dating of a whole continent, as in the case of Olduvai, a place which has an incredible number of radiometric ages. Stratigraphy is understood as the great chronological tool for the reconstruction of our evolution. And where neither volcanism nor radiocarbon reach, scientists are aided by the uranium series and electron spin resonance dating, with computer tomography and SEM scanning electron microscopy. Recent chronological dating methods and progress made in genetic interpretation are what have caused bibliographies on human evolution to grow over the last few years. With all of this the experts emphasized that chronology should not be understood as a value per se, and that the oldest fossil of some morphological variety may be as outstanding as the dating sequence, which allows for morphological or environmental variabilities linked to evolution to be established.

In Africa lithic industry appeared around 2.6 Ma ago, and that is where archaeology attempts to disclose the results of human activity and evidence of carving remains, food, fuel or hunting remains, habitation structures and evidence of a social or symbolic life. Fossils and artefacts have not always been found together in the archaeological record and their relationship in the record continues to leave, even today, unanswered questions. Together in this purpose are all the methodologies which now allow us to define the deliberate choice of rock according to its specific properties. The study of lithic technologies and the

distance from the supply source are elements which assist in supporting the scaffolding of the OUV. Many of the contributions presented here make specific mention of the relationship networks built up after the MSA and of evidence of forms of use of materials and processes which go beyond functionality. Early stages of diverse patterns of carvings have been identified and fully standardized, and some familiar resemblances in the whole continental space have begun to be noticed, all of this creating an analysis framework which surpasses by far the map of exceptional findings in East Africa. South Africa presents a potential scenario for deciphering the interchange between culture and biology, through international archaeology campaigns which are beginning to find wider contexts to explain changes. The coast of the Indian Ocean benefits from dynamic intervention methods and a range of ways of verifying the fossil record. Since the findings in Blombos, South Africa, which seemed unique, we are now making similar discoveries, such as ochre and ornaments. This area of study is invaluable for contributing to the debate on the diversity of adaptive responses, thanks to the evidence discovered from specialization in coastal adaptations, vital in broadening the array of cultural responses in modern humans.

It is clear that archaeological sites and paleontological sites cannot be conceived as the place where a fossil or artefact is located. The artefact might be a fundamental part in the interpretation of the site, yet it cannot represent the entire basis of its value. If we wish to also be in a position to study behaviour, we need to include wider conceptual and physical frameworks in our analysis, both in surface area and stratigraphic sequence.

In studies of evolutionary processes it is equally essential to examine the biological markers of the environmental conditions of hominid sites to explain adaptive models. Professor Raymonde Bonnefille's contribution is a clear appeal for multidisciplinary. The composition of plant landscapes (wood, fruits, grains and seeds) or of micro-components such as pollen, phytoliths and biochemical elements associated with the oxygen and carbon cycle, are also essential for defining the conditions of authenticity and integrity of the record. Reference collections on Africa built up over the past 40 years enable us to work out sequences that began 8 Ma ago. The palynological record is neither lithic nor osseous, but it has an unquestionable archaeological value. Translating the density variations of pollen's vegetation cover, in a constant dynamic, has been fundamental for creating a background reading on continental value, like those of Turkana or Awash. Plant cover is accompanied by changes in variations detected in the fossil record in dietary adaptations and dental morphologies. Adaptive strategies also need to be understood in conjunction with environmental sequences.

We cannot forget the contributions that disciplines such as ethnography and cultural anthropology have developed, generating inferences on the subject of hunter-gatherers and prehistoric humans.

In addition to the issues associated with analysing isolated erosion factors of depositional or post-depositional effects, challenges in establishing parallels of behaviour with non-producing societies, especially due to weaknesses of the oldest records, also need to be considered. The potential of the study of ethnographic models has been widely debated during the last 20 years. It has never been easy to identify how mobility records, systole and diastole aggregation and the dispersion of hunter-gatherer groups 'deposit themselves'. Furthermore, the types of habitats diversify since the end of MSA and, more so, in LSA. What is certain is that there were always bridges between archaeological and ethnographic disciplines that tried to find keys of inference. In this volume Prof. Deacon and Prof. Lupo talk about the possibilities and the results of the application of ethnoarchaeological methodologies, that is to say the process that contemporaries study from an archaeological perspective. The developments in human behaviour ecology have been important in recent years when it comes to analysing how environmental factors influence human behavior. In reality the bridges between these disciplines create complex questions that cannot be answered by one sole discipline. What has been illustrated is that these disciplines can contribute to conservation work. The studies on the declination of the type of use of fire/combustion reveal the need to have key records that divulge more than just the functional and technological discourses. Ethnographic readings can also contribute, in a general manner, to other questions about the possibility of deciphering traces of internal organization in the most ancient sites, when the record is quite badly distorted by taphonomic conditions or by a very limited number or type of artefact. Ethnographic evidence helps when it comes to defining, among others, the scale of the investigation, the site's limits, the methodologies of excavation and the area of influence. The contemporary study of occupation models and hunter gatherer methods open the way to questions which would not have been able to be made by themselves from an archaeological record and can be fundamental when interpreting sites such as Olorgesailie. Social and cultural anthropology also claim a role in this debate with a view of collaborating with an anthropological reading of human origins and have helped this cause with a knowledge base of over one hundred years. The origins of human social life, Primatology, evolutionary psychology and genetics get caught up with the debates established by anthropology, giving clues on the use of resources, rituals, forms of relationships, reciprocity or political organization. Prof Deacon talks about the importance of oral records and the need for better conditions of preservation and recording, that at the same time, underline the role of rock art as supporting and binding artistic expression of one of the most prolonged cultural sequences in Africa. The recommendation carries a sense of urgency. In the same way it is necessary to develop, as quickly as possible, protocols for anthropological research with original, contemporary communities.

## Why do we need an interdisciplinary approach?

With regards to the scientific methodologies previously analysed, the participants of the meeting in Addis Ababa identified a series of recommendations concerning interdisciplinarity, underlining scientific understanding and innovation as key in the transformation of perception of the built, archaeological and natural heritage environment (UNESCO, 2011).

*The heritage environment has undergone repeated transformational pressures, the survivors of the past demonstrating resilience against many cycles of changing natural environments, cultural preference, economic conditions and conservation practice. The heritage environment will be subject to substantial transformational drivers over the coming decades - by economic, governance and sustainability pressures, linked to climate change impacts as well as mitigation and adaptation across a range of scales (UNESCO, 2011)*

To meet future challenges there is a need to develop effective, adaptable management and decision-making policies and methodologies that utilize to best effect the latest scientific and technological developments. Heritage underpins and supports sustainable development. The proper conservation and utilization of our historic assets enhances our living and working environment. It also mediates cultural and historic identity at a range of spatial and temporal scales; important for our societies' wellbeing. Its effective management also plays a significant role in the drive towards sustainability, including the need for increased conservation of resources. There is a complex interaction here between social aspects and material understanding, that involves a wide range of stakeholders, from individual citizens concerned about their cultural reference to government that makes decisions on management and conservation, academics, and industry supplying services working directly in conservation.

## What is interdisciplinarity?

*The interdisciplinary approach is of the utmost importance in the identification, study, management and evaluation of the sites. In Africa, any scientific and conservation project must be balanced in a way to involve many disciplines across the natural and social sciences (broadly defined) but whose list doesn't need to be constrained. Beyond such multidisciplinary considerations, the discussion among the thematic group was more focused on the actual interdisciplinary dialogue and synergies (UNESCO, 2011).*

In consideration of the conclusions of the Burgos meeting, and with special reference to African sites, the participants stressed that, prior to any study or nomination file, specific emphasis must be attributed to systematic analysis across the full range of existing and potential stakeholders. Legal and cultural dimensions in particular are integral to an interdisciplinary approach.

A consequence of ICOMOS having the responsibility for human-related sites is that, when dealing with human evolution-related sites, there is a possible neglect within IUCN of Quaternary geology, geomorphology, and Quaternary Science in the original meaning of the word.

Interdisciplinarity also needs to be integrated into monitoring and evaluating transformations. Dynamic natural phenomena may lead, for instance, to erosion, deflation, burial and flood. Human action may lead to physical changes, such as land use (eg. pastoralism, agriculture and other intensive development aspects, which are often critical in Africa), and site management projects. Transformation processes may affect the narrative, conceptual and scientific value of the site, and understanding these impacts may require the application of emerging technologies. Owing to development initiatives and conceptual/ideological changes, the socio-cultural value of the site may also change.

Understanding patterns and processes of such transformations is a mandatory task in which interdisciplinarity plays a crucial part.

- Evaluation and periodic review of OUV and authenticity should be carried out within an interdisciplinary framework and used to assess change and development in these attributes.
- There is much scope for the inclusion of interdisciplinary evaluations of the boundaries for individual sites and the scope of serial sites, for example the use of stratigraphic boundaries to define archaeological sites. The underlying principle is that the boundaries should reflect the nature and scale of the phenomena under consideration, and be open to revision.
- Assessment of a site's potential value, including less visible material proxies and its potential to yield future information, should be defined by multiple disciplines.



In identifying protocols responding to transformation processes, mechanisms could be put in place which overcome fragmentation in the research basis, and create new synergies, by bringing together researchers and research users in an expert multi-disciplinary and multi-institutional grouping. Such a group or groupings could apply itself to consideration of themes such as 'Resilience and Adaptation' and the 'Nature of Transformation', in relation to built, archaeological and natural heritage to encapsulate commonalities in material culture and environment. Included in this could be the development of responses to current and predicted climate change at a high spatial resolution.

Priorities could include:

- A programme to establish the foundations of heritage resources at sites. They can be used in the prioritization of resources and intervention strategies.
- Collaboration in the framework of the HEADS Programme with the Advisory Bodies and active networks which could stimulate a reappraisal of Neogene and Quaternary Studies in terms of World Heritage, especially towards the treatment of human evolution. Included in this might be a consideration of how criteria (viii) can be incorporated into expressing the role of landscape and landscape history in relation to human history.

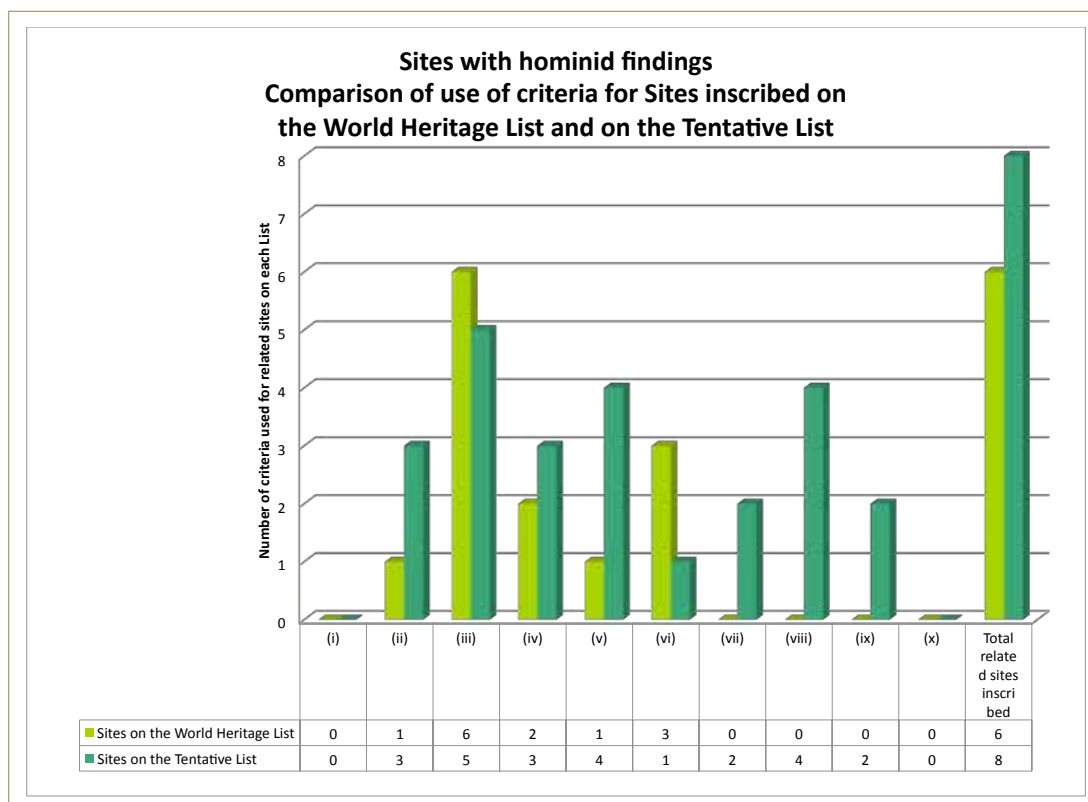


*Excavations at the MSA shell midden of Hoedjiespunt 1, South Africa.  
© University of Tübingen*



## Applying World Heritage criteria to human evolution sites

Table 1.



The participants discussed at length how to interpret the criteria that justifies OUV in order to better express the meaning of paleoanthropological and/or archaeological sites associated to human evolution. According to Table 1, it is clear that there is a tendency to include natural values in the Tentative List to better reflect the integrated relationship between nature and culture. These pages justify a holistic approach to ensure the integrated conservation standards of fossil records, fundamental in allowing an interdisciplinary reading of the site and contributing to the justification of the relevant conditions of its integrity. The participants found it necessary to move forward reflecting more deeply on the use of criterion (viii).

The following points related to human evolution-related sites were identified in accordance with the existing criteria (i)- (x) outlined in the *Operational Guidelines for the Implementation of the World Heritage Convention*, and are open for future discussions:

- (ii) The need to better conceptualize the expression 'human values'.
- (iii) The appreciation that this criterion has been widely used in inscribed sites. At the time of inscription, these sites did not, for the most part, include large archaeological deposits from cultural traditions or civilizations. It is interesting to note that the stages of evolution have been conceived as stages of civilization, placing all the value of the discovery of outstanding fossils in its research history.
- (iv) This criterion, in fact, is the closest in representing technological and archaeological sites such as fossil records that have born witness to our ancestors' morphological, biological and cognitive changes. 'Human history' is fundamental to the general statement of this criterion and includes all evolution of the genus *Homo*.
- (v) Subsistence strategies, almost certainly specialized from an early date, can be linked to this criterion, e.g. coastal sites such as in the case of South Africa.
- (vi) It is essential to characterize cognitive advances and forms of symbolism which are central in understanding our ways of learning, our beliefs, our faculty to use language and our capacity to transmit knowledge.
- (vii) Some places are associated to sites of scenic beauty.
- (viii) Some of the sites inscribed on the World Heritage List or submitted to the Tentative List incorporate outstanding stratigraphies which are key in understanding the history of the formation of continents, in addition to acting as a record of tectonic or volcanic activity which allows dating fossil records with relative or absolute chronology.
- (ix) All species that accompany the genus *Homo* throughout evolution explain ecosystems and biological fossil diversity that are crucial in interpreting the first hominids' palaeo-economic and palaeo-environmental behaviour.

## Geographies of cooperation

I would like to emphasize key issues that have been raised in the contributions on sites in Ethiopia and in the Maghreb area. Ethiopia deals with sites where research history has evolved more and more rapidly since the inscription of sites on the World Heritage List and new evidence brings about the need to adjust forms of management and conservation, at the same time as adjusting protection limits to include research's latest findings. North Africa, in turn, is to be included in the continental area so that processes that have taken place in its environment do not overturn the framework of interpretation of Mediterranean sequences. In addition to his contribution, Prof. Kuper points us to another critical step in the adapting history of the African continent: nomadic pastoralism in the Sahara.

### The case of Ethiopia

For five decades, unequalled, consecutive archaeological results increased and transformed our knowledge about the evolution of genus and species, with sequences that start in the Middle Awash Valley around 6 Ma ago. Included in this are the recent discoveries of 'Dikka', *Australopithecus*, dated to 3.4 Ma ago in the Lower Awash Valley. Furthermore, a new site called Fejej, has been uncovered which dates to 1.9 Ma ago. Although it is not within the limits of the inscribed site, Lower Valley of the Awash, the boundaries of the site could be extended to include it to strengthen the site's OUV. New evidence obliges us to adapt structures of protection and conservation.

The site of Middle Awash, which includes the whole complex of Afar and dates back to 4.4 Ma, has become a permanent area of research since its inscription on the World Heritage List and is now home to 300 archaeological sites; 50,000 fossils and a huge range of lithic industries were found. The World Heritage Retrospective Inventory exercise serves the purpose of updating, reviewing nomination files and defining and redefining limits, and/or updating regulations or management structures appropriate to the nature and scope of new evidence.

Omo is a point of reference for biochronological dating for the whole of Africa. Prof. Beyene's work indicates a certain urgency in taking action on the development that will take place in the region. Prof. Delange's contribution acts in tandem, confirming the area's potential and challenges. His work shows us how difficult it is, despite having exceptional preservation conditions, to limit settings in Neogene and Quaternary environments which has been affected by major volcanic and tectonic activity. The area is allowing us to study early on for evidence the dynamics of palaeontological and archaeological records, and with it, the ability to analyse the intent of manipulation of the stone. Archaeologists' micro digs have benefitted from taphonomic methods developed by palaeoanthropologists. What is clear from Prof. Delange's work is the struggle to distinguish, in the early phases of stone work, what is the product of human intention, anthropic activity and what is not. The application of new analytical methods is key in revisiting nomination dossiers and in broadening the spectrum of the site's OUV. This is in accordance with the results of the most recent research into the Shungura formation which has already more than 100 sites of low archaeological density. This micro/macro reading is fundamental in understanding the position of deposits, in analysing what happens between archaeological sites and in order to be able to better design archaeological interventions before starting the excavation process.

### In the case of North Africa

North Africa is where the sequence from the Lower Palaeolithic and the first continental migration dating back to 1.8 Ma ago is found, and shows evidence of some of the first adaptations of *Homo ergaster/erectus*. However, we still have very little research on the forms of subsistence of hominids in the Maghreb and it was only recently that we had the first palaeoclimatic and palaeoenvironmental reconstructions. It is important that this geography be integrated into African studies, that North African terminology be incorporated into the rest of the continent's and that the specificity of this geographical area be recognized from African industries. From a palaeoenvironmental point of view, this space protects the cultural and natural history of the desert and thus the subsequent forms of adaptation to aridity and to grazing.

Herders have not been studied in much detail archaeologically and this discipline is underdeveloped as a field of African studies. Their nomadic traditions and perishable material leave very transparent footprints, difficult to identify, and when they are visible they are difficult to preserve. Prof. Kuper's contribution introduces us to the Holocene and evidence of domestication.

The North African contributions raise our awareness of the cultural richness through social archaeology of the territory. From latitude 37°N to 35°S, Africa gathers the world's largest deserts, rivers and most plentiful lakes. These contributions encourage us to consider territories less remote but also in need of archaeological and anthropological attention and heritage protection. These areas play an important role in the social history of Africa today.

Prof. Kuper's input also allows us to analyse how the human species survived from 10 Ka when humanity abandoned the largely successful hunter-gatherer way of life in favor of another way of life, based on the conscious control of the reproduction of a reduced number of plants and animals. Kuper claims that, between 10,000 and 5,000 BC, the Sahara desert was home to the first herding communities, until its desertification forced the settlers to move to the Nile Delta.

The Neolithic Revolution is, without a doubt, one of the greatest contributions of prehistoric science to contemporary thinking, and Africa plays a vital role in it. The adoption of agriculture and grazing as primordial systems of food production is the material precondition of demographic, social and economic change, which has facilitated the process of acceleration of historic change that in the past 5,000 years has transformed a scarcely populated world, inhabited by small, self-reliant communities into the overpopulated and complex globalized world in which we live today.

It is for this reason that knowledge about and explanations for this development, its causes and its immediate and long-term consequences make up one of the core issues of prehistoric science and anthropology in all continents. Further study of the process in Africa is needed.

### Human evolution narratives and African sites

In order to get balanced spatial and temporal coverage, the experts recommended further reflexion on the potential of the following narratives/sites in order to contribute more effectively to the Global Strategy for World Heritage in terms of sites related to human evolution.

The following narratives identify different types of evidence of human evolution. They were drafted at the Addis Ababa meeting (UNESCO, 2011) to guide decisions by States Parties and to contribute to a credible, balanced and representative World Heritage List. The African sites suggested below could be considered for inclusion on the Tentative List and could ultimately start a candidature process to the World Heritage List. The list is, nevertheless, a useful guideline for the scientific community in Africa to help fill in the gaps in our knowledge about the long process of human evolution on the African continent.



*Sibudu Rock Shelter, South Africa. © University of Tübingen*

## 1. Palaeontology, biology and physical anthropology: hominids among primates and genetic studies

- The oldest ancestors of human lineage, including great apes.
- The oldest ancestors of human lineage in relation to morpho-functional anatomy.
- Neurological evolution.
- Genetics and palaeogenetics of great apes and the human lineage.

## 2. Fossil traces of cognitive steps: cognitive changes and human biological and cultural evolution

- The manufacture of artefacts.
- Conceptual ability and transmission, including symbolic behaviour, the use of ochre, art, personal ornaments and burial.

## 3. Fossil traces of technological and subsistence innovation - economic and cultural adaptation to changing environments

- Fire control, behavioural changes from scavenging to animal domestication by means of hunting and collecting marine resources, and plant/animal preservation in the environment.
- The technological progress of artefacts from simple flakes to pottery by means of prepared cores and composite tools.
- Habitat patterns, e.g. shelter construction.

## 4. Colonization of new environments – records of expansion in new niches

- From tropical woodland to open woodland and grassland.
- From tropical to temperate areas.
- Specific or extreme environments.

## 5. Dispersals and migrations

Within Africa, pan-African settlements including arid and elevated regions.

'Out of Africa' dispersals – early Pleistocene and *H. sapiens* dispersals.

Pulses of colonization, territorial and demographic expansions and contractions, noticeably in connection with climatic changes, environmental collapses and the availability or reduction of resources. Special attention must be paid to the major climatic events of the Quaternary including the Last Glacial Maximum and subsequent Holocene climatic change. Colonization from Southeast Asia to Australia and the Pacific Islands, the New World and high latitude areas.

Some of these narratives do not apply to Africa. Those that do apply have been identified at sites in the following countries. The numbers at the end of each site description refer to the narratives numbered above.

NARRATIVE	STATE PARTY / SITE	REGION
1. Palaeontology, biology and physical anthropology: hominids among primates and genetic studies	<b>Chad</b> Djourab – primate and hominid fossils, fauna. Narratives 1, 2. Ennedi/Ounanga – geological and environmental values. Narrative 1.	Sahara East Africa South Africa
	<b>Ethiopia</b> Chorola 10 myr early hominoid/ape fossils. Still need to close gap between 10 mya and 6 mya in Ethiopia. Narrative 1. Afar: boundary extension for a palaeonthropological site that extends 250 km from Dubti in the north of the main Afar rift to Kesseme-Kebena in the south. Serial nomination: Omo WHS on the east side Fejej LSA to Miocene with hominids at 4 and 2 mya, continuous sequence of stone tools. Narratives 1, 2. Melka Kunture, Goda-Mota and Lake Zway as a serial nomination: already fenced. A buffer zone needs to be identified. The two sites complement each other and would be managed by the same office and under the same budget. Narratives 1, 2, 3. Konso Gardula: Stands alone. More pertinent danger in terms of conservation and population encroachment. Narratives 1, 2, 3.	

NARRATIVE	STATE PARTY / SITE	REGION
	<p>Porc Epic and surroundings – MSA-LSA sequence in cave sites, fauna – <i>H. sapiens</i> - rock paintings. Narratives 2, 3.</p> <p><b>South Africa</b></p> <p>Site of <i>A. sediba</i> needs to be added to the already listed site on Gladysvale. Narrative 1.</p>	
<p>2. Fossil traces of cognitive steps: cognitive changes - human biological and cultural evolution</p>	<p><b>Morocco</b></p> <p>Atlantic coastline cave sites: Casablanca sequence from 5 cave sites – Acheulean at 1 mya to 100,000 – threatened by urban development with early Hominids. Narratives 2, 3.</p> <p>Djebel Irhoud: archaic <i>H. sapiens</i> – open site – Middle Palaeolithic Mousterian – 130,000. Narratives 2, 3.</p> <p>Taforalt: Upper Palaeolithic burial site 22,000 <i>H. sapiens</i>. Narratives 2, 3.</p> <p>Salè, near Rabat – earliest <i>H. sapiens</i> in North Africa. Narratives 2, 3.</p> <p><b>Ethiopia</b></p> <p>Afar: boundary extension for a palaeoanthropological site that extends 250km from Dubti in the north of the main Afar rift to Kessesem-Kebera in the south. Narratives 1, 2, 3.</p> <p>Melka Kunture, Goda-Mota and Lake Zwai as serial nomination: already fenced. A buffer zone needs to be identified. Narratives 1, 2, 3.</p> <p>Konso Gardula: stands alone. More pertinent danger in terms of conservation and population encroachment. Narratives 1, 2, 3.</p> <p><b>Eritrea</b></p> <p>Buia – <i>H. erectus</i> – Acheulian tools 1 mya. Narratives 2, 3.</p> <p><b>Kenya</b></p> <p>Kapthurin: hominid site. Narratives 1, 2, 3.</p> <p>East and West Turkana should be joined and included together. Narratives 1, 2, 3.</p> <p>Tugen Hills: oldest hominid sites. Narratives 1, 2, 3.</p> <p><b>Tanzania</b></p> <p>Peninj – Acheulean and hominid mandible. Narratives 1, 2, 3.</p> <p>Lake Eyasi – an early hominid site. Narratives 2, 3.</p> <p>Mumba Cave – MSA-LSA sequence, human remains, fauna. Narratives 2, 3.</p>	<p>North Africa East Africa East Africa</p>
<p>3. Fossil traces of technological and subsistence innovation - Economic and cultural adaptation to changing environments</p>	<p><b>Mauretania</b></p> <p>Adrar Bous – Open air sites – sequence Acheulian to Neolithic – fauna. Narrative 3.</p> <p><b>Tunisia</b></p> <p>Sidi Zin site: Late Acheulean - Mousterian open site less than 200,000 mya – fauna. Narrative 3.</p> <p><b>Algeria</b></p> <p>Ain Hanech – Oldowan to Acheulean and late Palaeolithic, including Ain Boucherin. Narratives 2, 3.</p> <p>Tighenif (Ternifine): 3 mandibles, parietals and isolated teeth. Legally protected but surrounded by the town. 700,000 mya. Earliest <i>H. ergaster/erectus</i> in North Africa. Narratives 2, 3.</p> <p>Afalou-Taza Cave Complex over a distance of about 30 km: modern human burial. Sequence from Middle Palaeolithic to 10,000 – North African modern humans. Baked clay figurines 15-11,000. Narratives 2, 3, 5.</p> <p><b>Libya/Sudan/Egypt</b></p> <p>Jebel Ouenat Transboundary site: Libya-Egypt-Sudan – significance ranges from geology to art and early pastoralism: an island in the desert. Narratives 2, 3, 5.</p>	<p>North Africa Horn of Africa East Africa Southern Africa</p>

NARRATIVE	STATE PARTY / SITE	REGION
	<p><b>Libya</b></p> <p>Haua Fteah Cave: long Palaeolithic sequence Dabban – Neolithic – fauna – human behavioural change through time. Narrative 3.</p> <p><b>Egypt</b></p> <p>Nabta /Bir Kiseiba: complete Holocene climatic sequence with early domestication – cattle believed to be there at 9000 BC, presence confirmed at 6000 BC. Narratives 3, 5.</p> <p>Sodmein Cave, Eastern Desert: Middle Palaeolithic sequence and early domestication with earliest sheep/goats with pottery at 6200 BC. Narratives 3, 5.</p> <p>Wadi Sura: cave site with unusual rock art – landscape with archaeological chronology from hunter-gatherers to pastoralism. Narratives 3, 5.</p> <p>Nazlet-Ikhate: Upper Palaeolithic stone technology with mining – raw material exploitation and transportation – 130,000. Narrative 3.</p> <p><b>Djibouti</b></p> <p>Baroghli – 1 mya Early Stone Age Elephas butchering site. Narrative 3.</p> <p><b>Ethiopia</b></p> <p>Porc Epic and surroundings – MSA-LSA sequence in cave sites, fauna – H. sapiens - rock paintings. Narratives 2, 3.</p> <p><b>Kenya</b></p> <p>Olorgesailie – open air Acheulean site with artefacts, fauna and homind remains. Already open to the public. Narratives 2, 3.</p> <p><b>South Africa</b></p> <p>Wonderwerk Cave – long sequence from Acheulean to Later Stone Age – mobiliary art, fauna, possible early traces of fire. Narratives 2, 3.</p> <p>Various Middle Stone Age sites with a variety of examples of complex symbolism and coastal adaptations.</p> <p>(a) With early modern human fossils and already on the Tentative List: Klasies River, Border Cave.</p> <p>(b) Without human fossils and not yet on the Tentative List: Blombos, Diepkloof, Sibudu.</p> <p>Narratives 2, 3, 5.</p> <p>Coastal environments – expansion in new niches. Narrative 4.</p> <p><b>Namibia</b></p> <p>Apollo 11 Cave – Middle Stone Age with mobile art. Narrative 3.</p>	
4. Colonization of new environments – records of expansion in new niches	No sites suggested. Although there is evidence for climatic change and people adapting to it, for example, in the Sahara, there is little evidence of people migrating into new niches.	
5. Dispersals and migrations	<p><b>Libya</b></p> <p>Messak: open sites with rock art in the desert showing major climatic change during the Holocene. Narratives 2, 5.</p>	North Africa

## Narratives that focus on Africa and its contribution to human evolution

1. Palaeontology, biology and physical anthropology: hominids among primates and genetic studies.
2. Fossil traces of cognitive steps: cognitive changes - human biological and cultural evolution.
3. Fossil traces of technological and subsistence innovations - economic and cultural adaptation to changing environments.
4. Colonization of new environments – records of expansion in new niches.
5. Dispersals and migrations.

## Possible gaps in World Heritage narratives of human evolution in Africa

- Gaps in hominid dispersal.
- Fluctuating environmental changes in the Sahara.
- Colonization of new environments – records of expansion in new niches.
- Dispersals and migrations.
- General gap in sites in West and Equatorial Africa.
- Gap in sites demonstrating early domestication of plants and animals – possible candidates include:
  - Ethiopia: Laga Oda, Temben
  - Kenya: Dongodia
  - Djibouti: Gobad

## The way forward

It is particularly interesting to highlight the implementation of the World Heritage Convention in the States Parties that already have extensive experience in the conservation of sites linked to human evolution. We would now like to refer to the important contribution of Ms Nonofho Mathibidi Ndobochani in this publication, who presents us with the national perspective of South Africa, a country which holds 15 important registered archaeological sites which are all related to HEADS. From accumulated experience, her country has solid grounds to dictate protection systems and their regulation for research, conservation and management. This is fundamental for renewing the Tentative List, which includes a tendency to better represent OUV linked to modern humans and which include long sequences, as in the case of Wonderwerk Cave, or Klassies River mouth as a coastal site that, due to the finding of numerous skeletons there, demonstrates that modern humans evolved in Africa.

The participants followed the lead of the South African representative by collectively recognizing a series of priority conditions and actions that have been mentioned in the following paragraphs and which express the conviction of the specialists regarding the fact that:

- Conservation is not only the responsibility of the researchers. It is also essential to design research and conservation planning systems through action plans, in which science and management are not considered at different times or by unrelated teams.
- It is necessary to pay close attention, from the beginning of the nomination processes, to the problems that may arise from private property in the registered areas.
- It is fundamental to include in the research, conservation and management strategies a dialogue encompassing the values and environmental needs of contemporary society.
- It is necessary to be able to generate significant public access to the research results and, whenever possible, to facilitate educational initiatives and visitor interpretation at sites linked to human evolution.
- It is necessary to strictly clarify the role of the scientist and of the community in the decision-making processes regarding research and conservation.
- As an educational and economic strategy it is necessary to develop good practices in paleoanthropological tourism, but always regarding the conservation of the site as the fundamental principle, from which all public uses of the site thereafter stem from.
- All the processes linked to post-excavation require a collaborative investigation, as the Laetoli case proves. The different disciplinary and institutional visions should be taken into account favouring the preparation of the OUV. Significant access to a resource does not necessarily imply a physical visit. Sites such as Altamira or the Lascaux Caves cannot be visited. In the same way, it is fundamental that the communities are not limited or overshadowed by the distant past of their cultural capital. However, the communities also need be clearly aware of the scientific criteria that contribute to finding the formulas for an efficacious balance between enjoyment and conservation and, with it, the effective regulation of visitor activity.
- It is necessary to identify how, at a national level, it is possible to create decision-making strategies that do not work against the role of those in charge of heritage and instead favour other sectors related to the economy, environment and land management. The heritage protection laws, and the requirements of their studies on environmental and heritage site impact, cannot compete when a country is prevailed over by financial rather than conservational decisions. Energy, housing, water, mines or other types of infrastructure are invariably established so that the national laws cannot defend existing archaeological surface areas and subsoil.



Each of the narrative statements presented here builds a bridge between epistemological and disciplinary assertions, and tries to answer questions like: 'When did our origins begin?' and 'From what moment can we begin to talk about mankind?' All of these contributions explore the time and geography of the origin of our biological and cultural diversity from Africa. There is not a wish to create an encyclopaedia in these pages. In accordance with the experiences already developed in areas more thoroughly explored by African archaeology, questions can be agreed upon related to processes other than those already carefully studied in the Rift Valley, for other more comprehensive geographical areas not especially limited to Eastern Africa.

In these pages we have talked about hunting methods, scavenging, uses of fuel and the role of cognitive and symbolic advancements in the history of a species that is originally African, as the genesis of all our inventive boldness. Every contribution has given an overview of the extensive disciplinary investigation of the human condition, although it is evident that the sites registered to date in the World Heritage List do not include the whole episodic itinerary of our progress, making us the modern humans we are today. This is what enables us to present the narratives that can put together a more complete sequence and one that is aligned with the current state of our knowledge. Let us hope that everything established so far becomes outdated, that its provisionality is put to the test by scientific advances and new registered sites. Hopefully we will be able to witness a better representation of paleoanthropology and of its processes in the African Tentative Lists.

Sites linked to the archaeology of human origins in Africa cannot be conceived exclusively as archaeological sites, neither because of their nature nor because the archaeological methodology may be the only or main discipline for establishing the OUV of the sites. The preceding chapters give a good account of the interplay between disciplinary dialogues and how they interconnect, which enables us to reconstruct the earliest attempts at our first cultural diversity.

In all of the places researched, the crossover between culture and nature is dealt with in an integrated way, in environments understood to be mutually represented. We are now able to see unprecedented results that fine-tune dating and allow for other constructions of models of the past. Nevertheless, these pages make it clear that we do not possess any evidence of lithic manifestations or of the technologies these entailed prior to 2.6 Ma ago:

- the meaningful stratigraphic contexts do not go back beyond over a million years ago, when we get further away from the Rift Valley, and that it is necessary to think of alternative research scenarios;
- there is a great shortage of information for ecologically extreme environments such as the desert or the tropical rainforests, for which they have not been able to chart evidence so far;
- the savannah was not only limited to eastern Africa and that even what today is desert could have been a herbaceous environment that facilitated migrations towards the Mediterranean, and that the exchanges of fauna across the Bab el Mandeb Strait testify to this;
- if the first colonist was *Homo erectus*, able to reach Asia, it is not impossible to believe that his movements inside Africa also allowed him to reach other 'nearer' places than Georgia or Indonesia; and that the knowledge we have about the Plio-Pleistocene occupation in Africa is still very incipient.

Despite Africa being over 30 million square metres in size, its most outstanding archaeological sites in the history of research have been uncovered in the last 25 years. It is important to point out, that in the last few years, South African coastal sites have not ceased to amaze us with findings and have also produced a series of dynamics and research, especially modern humans' strategies of subsistence.

The primary position of East Africa's stratigraphies has always taken the lead over the terraces of the major river basins of the Nile, Congo and Zambezi, whose materials are found in secondary position. The Great Rift Valley allows us to analyse lake sediments from which we are able to establish chronologies throughout the rest of the continental terrain.

Much of the African continent has suffered bloodshed since 1970 which has slowed down research in Angola, Sudan and Libya, whilst research activities were still being carried out in Kenya and South Africa, contributing decisively to the formation of institutional architecture for investigation, led by national scientists.

These pages also show us the need of establishing protocols for scientific cooperation with collegial research design, and in this sense, the aim of starting the nomination process can help.

It is not only about digging to find the most ancient or the biggest fossil, nor is it about just about excavating to find what could be considered a treasure or about dedicating research solely to find the missing link. It is about finding results that allow the preservation of sites where the establishment of interdisciplinary work makes them into a reservation area for future work through the preservation of integrity and good health of related movable heritage materials.

These pages would also like to acknowledge that the heritage of the first human cultures could quickly run out. The soil and subsoil is envied by other continents. Many of the conclusions coming from this study reveal that there is urgent work to be done with our evolutionary heritage, with our resources being less renewable and which are, however, part of the irreplaceable wealth of what makes us humans.

We close this publication that the reader has in hand very soon after the UN Earth report of June 2012 was published in the wake of the Rio+20 Summit. The report gives a good account of how the situation has worsened compared to 2005 (*Millennium Ecosystem Assessment*). Perhaps now, more than ever, it will be useful to retrieve our repertoire of biological, conceptual and cultural tools; we now have the opportunity to choose a green future that respects our universal heritage. We must, therefore, put our ethic capacity and our ways of respecting creative diversity to the test.

If we are culturally prepared to adapt again, we must ask what opportunity we are going to give it, how we will activate a new awareness of survival, what is the degree of resilience that we have; that we are, and we were the most adaptable of mammals. These pages have made an attempt to teach us something about our far-distant past to help us understand what probably awaits us and, with that, to ask ourselves if we continue being the beginning or if our evolution is indicating that we are, in fact, at the end, the end of the chain.

We are grateful for the hospitality that Africa has shown towards the HEADS Programme, as generous as the African contribution to the knowledge of human origins has also been. We were all Africans in the past, and so through this work clues can be found to make us become more aware of our debt to Africa. We must make clear the responsibility that everyone holds to not deprecate its recent history, since in a distant past it was the cradle of humankind. Our strategies for research and conservation of our African evolutionary heritage must be carried out with an ethic of shared global responsibility.

We were finishing these lines when the sad news of Professor P. Tobias passing away reached us. Without a doubt with one of the most cohesive biographies in the history of research throughout the entire twentieth century, we remember him affectionately here, as his knowledge was as vast as the generosity with which he worked with UNESCO in the South African nomination procedures. These remain today as a benchmark for whatever ventures may be undertaken in the future.

In Africa every culture can recognize itself, in places where time stood still but where research today has been able to recreate our universal accumulated identity. In Africa we tried out our social brain for the first time and that is why there, more than in any other place, we must be prevailed on to exercise our memory for the origin of our genus.

The determination and perseverance of my colleagues in the World Heritage Centre has been another invaluable factor in allowing this publication to reach the hands of the reader. I am most grateful to my colleagues from the Africa Unit and the Arab States Unit for their advice and I would especially like to thank Penelope Keenan for her dedication and expertise, as well as Chantal Connaughton, Nuria Ametller and Emmanuelle Lachaud for having rounded off the group that made this publication possible and which today enables us to achieve a greater awareness of the work involved and the challenges faced by international cooperation. I very much hope that these pages can show us once again how much we are collectively indebted to mother Africa.



*Melka Kunture, Ethiopia. Participants of the meeting, 'African human origin sites and the World Heritage Convention', 8 to 11 February 2011. © UNESCO/IWHC*

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## CHAPTER 28

# Rock Art and the UNESCO World Heritage List

*Nuria Sanz*

### ABSTRACT

Rock art as the manifestation of human conceptual thought and beliefs by traditional societies has endured for longer than any other global artistic tradition. As rock art does not easily conform to specific codification, or thematic or geographic distribution, it is often difficult to find standardized criteria for its study. Rock art is a core dimension of the World Heritage Thematic Programme “Human Evolution: Adaptations, Dispersals and Social Developments” (HEADS), adopted by the World Heritage Committee in 2009. This chapter outlines the current strategy of cooperation and implementation to ensure the future recognition, conservation, and research of these vulnerable sites in relation to the World Heritage Convention.

The World Heritage Convention is a treaty of public international law which enjoins the states parties that have ratified it to ensure the protection of their own natural and cultural heritage of outstanding universal value by placing their properties on the World Heritage List, thus ensuring their conservation through close cooperation between nations. To date, 35 rock art sites of outstanding value have been included in the List worldwide (Table 28.1). In addition to these sites, there are major occurrences of rock art in more than a hundred cultural and natural sites included in the List. This number of sites could clearly be increased since defining rock art is as complex, involved, and arduous as the dating of its expressions.

Rock art speaks a universal language, and the distribution of its expressions has already shown clearly how Article 7 of the Convention can be applied. Rock art

Table 28.1 Rock art sites on the World Heritage List (as of May 2011)

<i>Country</i>	<i>Site name</i>	<i>Date of inscription</i>	<i>Criteria</i>	<i>Cultural landscape</i>	<i>Core zone (Ha)</i>	<i>Buffer zone (Ha)</i>
Africa						
Botswana	Tsodilo	2001	(i), (iii), (vi)		4800	70,400
Gabon	Ecosystem and Relict Cultural Landscape of Lopé-Okanda	2007	(iii), (iv), (ix), (x)	√	28,168	150,000
Malawi	Chongoni Rock Art Area	2006	(iii), (vi)		12,640	9194.4828
Namibia	Twyfelfontein or /Ui-//aes	2007	(iii), (v)		57,4269	
South Africa	uKhahlamba / Drakensberg Park	2000	(i), (iii), (vii), (x)		242,813	
South Africa	Mapungubwe Cultural Landscape	2003	(ii), (iii), (iv), (v)	√	28,168	660,156
Tanzania	Kondoa Rock Art Sites	2006	(iii), (iv)		233,600	
Zimbabwe	Matobo Hills	2003	(iii), (v), (vi)	√	205,000	105,000
Arab States						
Algeria	Tassili n'Ajjer	1982	(i), (iii), (vii), (viii)		7,200,000	
Jordan	Petra	1985	(i), (iii), (iv)			
Libyan Arab Jamahiriya	Rock Art Sites of Tadrart Acacus	1985	(iii)			
Saudi Arabia	Al-Hijr (Mada'in Saleh)	2008	(ii), (iii)			
Asia and the Pacific						
Australia	Kakadu National Park	1981 Extension: 1987, 1992	(i), (vi), (vii), (ix), (x)		1,980,400	
Australia	Purnululu National Park	2003	(vii), (viii)		239,723	79,602
India	Rock-shelters of Bhimbetka	2003	(iii), (v)	√	1893	10,280
Kazakhstan	Petroglyphs within the Archaeological Landscape of Tangaly	2004	(iii)	√	900	2900
Republic of Korea	Gochang, Hwasun and Ganghwa Dolmen Sites	2000	(iii)			
Europe and North America						
Azerbaijan	Gobustan Rock Art Cultural Landscape	2007	(iii)	√	537.22	3096.34

France	Prehistoric Sites and Decorated Caves of the Vézère Valley	1979	(i), (iii)	
Ireland	Archaeological Ensemble of the Bend of the Boyne	1993	(i), (iii), (iv)	
Italy	Rock Drawings in Valcamonica	1979	(iii), (vi)	
Italy	The Sassi and the Park of the Rupustrian Church of Matera	1993	(iii), (iv), (v)	1016
Norway	Rock Art of Alta	1985	(iii)	√
Portugal	Prehistoric Rock Art Sites in the Côa Valley	1998	(i), (iii)	
Spain	Cave of Altamira and Palcolithic Cave Art of Northern Spain	1985, extension 2008	(i), (iii)	2234.71
Spain	Rock Art of the Mediterranean Basin on the Iberian Peninsula	1998	(iii)	
Spain	Manifestations of Rupestrian Art in Siega Verde	1998	(i), (iii)	
Sweden	Rock Carvings in Tanum	1994	(i), (iii), (iv)	
Turkey	Göreme National Park and the Rock Sites of Cappadocia	1985	(i), (iii), (v), (vii)	9576
United Kingdom	Stonehenge, Avebury, and Associated Sites	1986	(i), (ii), (iii)	
Latin America and the Caribbean				
Argentina	Cueva de las Manos, Río Pinturas	1999	(iii)	
Bolivia	Fuerte de Samaipata	1998	(i), (iii)	
Brazil	Serra da Capivara National Park	1991	(iii)	
Chile	Rapa Nui National Park	1995	(i), (iii), (iv)	
Mexico	Rock Paintings of the Sierra de San Francisco	1993	(i), (iii)	

Note: for criteria, see <http://whc.unesco.org/en/criteria>.

has functioned as an international language, employing geographically universal terms, throughout the entire period of human existence. In terms of their forms of analysis and the justification of their value, rock art sites are no longer seen as instances of subjective self-expression but as scenes of shared cultural experiences and collective symbolism.

The World Heritage List at present consists of 911 sites included over a period of more than 37 years during which the World Heritage Convention has been in force. Of those sites, only 35 sites are of outstanding universal value for their expressions of rock art (see Table 28.1). This is clearly a very limited selection. Rock art is present in all regions of the world, often occurring in extensive concentrations of images and where durability is at its greatest. In a significant number of these places, the sites have remained part of the imaginative world of the communities for centuries or even millennia. Their quantity, quality, duration, and distribution are recurrent features in all of the world's geographic zones.

Rock art expressions resist clear and precise geographic, technical, or conceptual classification. They do not easily submit to static codification or to thematic or geographic distribution. It is difficult to find standardized criteria for their study or cataloguing. Recurrent features and singularities confuse the most seasoned experts. Despite international attempts at classification, the structural elements of rock art expressions, the definition of unity of the site or unity of landscape, the forms of documentation and cataloguing are formulated so variably that they defy any rigid, valid, worldwide compartmentalization. The variety of techniques (geoglyphs, high and low reliefs, paintings, engravings), together with the variety of decorative/functional surfaces (caverns, shelters, or places in the open), and their presence in the most diverse geographic areas, ecological tiers, and latitudes of all continents, confirm that we are in an exploratory phase, just beginning to understand their value and to identify sound methods for their conservation. In this regard, the lessons learnt at the rock art sites already on the List illustrate the need for greater international cooperation. Given the daily reports of disappearances and destruction, urgent support must be provided for research, intervention, and advocacy, a point to which the World Heritage Committee should not be indifferent.

The World Heritage Centre conducts activities in close collaboration with the representatives of the Advisory Bodies of the Convention – the International Council on Monuments and Sites (ICOMOS), the International Centre for the Study of the Preservation and Restoration of Cultural Property (ICCROM), and the International Union for Conservation of Nature and Natural Resources (IUCN) – and with some of their specialized committees, in particular the International Scientific Committee on Rock Art of ICOMOS. This allows us to explore all of the ways in which the operational guidelines of the Convention may be applied to the singularities and peculiarities of individual rock art sites and regions. However, rock art does not occupy a large place in multilateral political agendas in a world in which artistic expressions appear to be overshadowed by the power of industry. Nevertheless, the international community is aware of the impact of any form of vandalism on rock art and must foresee the possible future impacts of climate change which will threaten many instances of graphic forms used by humans to narrate and transmit messages. The outstanding universal values which provided the basis for entering rock art sites

on the List should spur international action to enhance and protect them through a worldwide ownership campaign. This is both urgent and necessary.

In the case of the 35 rock art sites already on the List, serial evaluation has involved crossing over geographic and disciplinary areas that cross cultural and geographic borders. Each justification of outstanding universal value has matched the singularities of the site against one or more of the six cultural criteria of the 1972 Convention, on the basis of the appreciable visual components, accompanied or not by archaeological records or ethnographic studies supporting the applicability of these criteria. According to many theorists and critics, art transcends history and enables us to withdraw from it, which suggests a certain aspiration to universality. Many rock art sites have been chosen for their aesthetic quality, whereas what prevails in the case of others, beyond their technique, is the anthropological universality of creativity. In most recent inclusions, the formulation of value depends on the ways of life, past or contemporary, that have lent significance to these expressions. The artistic works and nominations have an accompanying rhetoric whose function is not to explain them but to place them in a context of sense and significance (Jiménez 2002). There is undoubtedly a need for conceptual and methodological work to group perceptions with criteria in order to put this judgment in objective terms. Art is never self-sufficient as the positivists claim. The rock art included in the List, apart from being seen as an historical example of timeless beauty, requires a global community (called “the artworld” by Danto 1964) that guarantees the coherence of the perception and clearly defines the parameters of comparison between rock art sites in order to determine why their components are outstanding.

In a great many case studies, the rock art representations no longer have any meaning for observers who lack any cultural or historical connection with what they see, or with the society which produced the rock art (and, in some cases, continues to do so). The geographic distribution of rock art demands an enormous worldwide effort, with the recognition that it is very hard to grasp its meaning. Upon inclusion on the World Heritage List, rock art is given meaning by the international community through a multicultural approach to aesthetics whereby the site is classed as a place of universal significance. The reader will certainly see how difficult it is to identify the reasons for establishing a hierarchy between rock art sites if each site is itself unique. Comparative analytical methods have so far identified qualities linked to the outstanding nature of the technique and the composition of rock art scenes, the dimensions and the realism of the representations, while being aware that often our current knowledge and research cannot provide all the necessary information about all recurrent features and peculiarities. In some cases, what is emphasized is the accumulation of time, of representations, or of natural and/or cultural spaces (protected or not) in which art articulates landscapes. This is essentially a quest to expand an area within which it is contextualized and ensuring its integrity through integrated forms of territorial planning.

Rock art may be understood as a kind of grammar, like pictographic writing, extending in various forms throughout the world’s geography, but whose study defies set patterns. Beliefs, representations of magic, war, navigation, hunting and gathering cover more than 40,000 years of human history. This is a long-lasting global phenomenon, undoubtedly a fundamental form of cultural expression drawn on by all



prehistoric peoples the world over. In all latitudes, it functions as a major bearer/recipient of memory, allowing each society to rediscover its roots. This art form enables cultures to speak about themselves and their origins in any geographic setting. It is thus a non-written, historical archive of peoples that extends over an enormous spatiotemporal range. Without a doubt, it is a vast body of heritage, currently expressed in just 35 sites of outstanding universal value.

Since 1992, the category of “cultural landscapes” under the World Heritage Convention has offered a better way of contextualizing the culture of rock art sites. The artistic expressions enter into a dialogue with the components of the landscape, and this helps to define the forms of expressive cultural cross-fertilization between humans and their environment. In turn, this makes it possible to justify the value of the site, integrating its tangible and anthropological potential in contrast to conceptions confined to the aesthetic value of the representations. Moreover, this approach increases the challenge since the conservation of cultural landscapes means ensuring a future for all elements of the creative cultural process. From being static scenarios, rock art sites gradually embrace ways of life, acquisition of meaning, and the instruments of their appropriation. This represents a sort of *desacralization* of art which leaves room for more anthropological and scientific forms of analysis.

Art may be understood as the reorganization of the perception of the world. In their interpretation of primitive art, many artists believe in a simple message concerned with elemental forces which, by reason of their simplicity, radiate direct and subtle feelings of enormous vitality, as if this were an immediate contact with life. There is something very direct and immediate about figurative rock art that points to a certain survival of meaning. Yet, as Bourdieu saw it, something simple is merely something that has been simplified (Bourdieu et al. 1969). Rock art representations contain rich universal connotations, from the mythical to the technological. There is something irremediably human in the creation of shapes with one’s hands, but symbolic forms of knowledge and identity are implicit in the laboriousness of their making and transmission. Undoubtedly, rock art expressions have always sought a receptive state in the same cultural universe. It is archaeologists, ethnographers, anthropologists, and semiologists from a foreign cultural universe who must teach us how to see.

Among the outstanding universal value of the rock art sites already on the List we may highlight:

- The enormous concentration of expressions, as in the case of Tsodilo in Botswana where 4,500 paintings have been recorded, scattered over 10 square kilometers, which cover a time-span of 100,000 years; or the concentration of petroglyphs at Twyfelfontein /Ui-//aes in Namibia.
- The testimonies of profound changes in animal life, flora, and human lifestyles, as in the cultural landscape of Lopé-Okanda in Gabon, or uKxahlamba/Drakensberg in South Africa.
- The representation of ceremonies, rituals, and economic practices which reveal community lifestyles and forms of symbolic and production-related control of the territory, as in the case of Chongoni in Malawi and the Matobo Hills in Zimbabwe, some of which are still in use to this day.

- Places directly related to forms of animal migration, which provide proof of human cultural adaptability in geographic areas of significant seasonal change, as in Tassili n'Ajjer in Algeria.
- Places at which a substantial number of techniques, types of sites, and human settlements are found, such as the Kakadu National Park in Australia.
- Geologically picturesque sites, for example the Purnululu National Park in Australia.
- Places where the technical precision, number, and quality of rock art representations have moved them out of the ancestral sphere and into the imagination of today's populations, who reproduce the images at home or use them in their contemporary ceremonies, as is the case of Bhimbetka in India.
- The enormous quantity of related archaeological sites, such as in the Mapungubwe cultural landscape in South Africa, where 400 recorded settlements coexist with rock art sites on 30,000 hectares of land.
- The exceptional nature of open-air Paleolithic art, given that the scientific community had, until the 1990s, believed early human artistic expression to be confined to caves.

Through various seminars and international expert working groups, the World Heritage Centre has made a detailed study of the issues relating to rock art sites already on the List, ranging from sites that have been included recently to those listed more than 20 years ago; from archaeological sites where local communities (indigenous or other) play a vital role in preserving the contemporary cultural life of the site to places where visitors form the only significant community in the protected area; from the most well-known and accessible places to some of the most remote sites of the world.

A review of all the sites already on the List suggests the following:

- The need to include the rock art of archaeological cultures that are well represented on the List, such as the Mayan culture, but whose cave rock art has not been studied, as in the case of the Naj Tunich Cave in Guatemala.
- The need to promote cooperative mechanisms that will enable serial properties to be included in the List, taking into account the linked nature of artistic expressions which know no contemporary institutional or political boundaries, as in the case of Mediterranean rock art in Spain, or a potential transnational nomination of decorated Atlantic megaliths.
- The need to think about protecting rock art sites through integrated cross-sectoral legislation in order to ensure their integrity and safeguard their values.
- The need for international cooperation in the case of nominations requiring documentation and research that exceeds national technical and financial capacities.
- The need for rock art to be recognized in places undergoing broad territorial and economic transformations, such as the Amazon Basin.
- The need to "listen" to art, the necessity of narration, the importance of being able to record oral expressions that are directly related to production and/or religion in places where, owing to cultural change, there is no guarantee that such practices will endure in the medium term.

All this is combined with the need to give urgent consideration to the ethnographic/anthropological aspects of rock art in terms of heritage conservation and the

implications stemming from contemporary forms of traditional lifestyles, the nomadic practices of modern hunters and gatherers, or issues relating to the conservation of rock art among populations choosing to live in isolation. It would not be unreasonable to begin including oral recordings in World Heritage studies as evidence of how contemporary societies use and understand rock expressions.

The Global Strategy for a balanced, representative, and credible World Heritage List, which was adopted by the World Heritage Committee in 1994, provides a methodological and operational framework for applying the World Heritage Convention. The purpose of the analytical framework was to encourage countries to ratify the Convention, prepare and harmonize the Tentative Lists nationally and regionally, and to submit nominations in categories and for regions under-represented on the World Heritage List.

The World Heritage Committee has expressed its concern at the imbalance in the themes, geographic regions, and chronology of the World Heritage List for more than a decade. Rock art has become, for the reasons mentioned above, a universal means of achieving greater balance in all regions.

Over the past decade, the Advisory Bodies of the Convention have expressed their concern at the poor preparation of rock art site nomination files. Examination of the nominations has mainly revealed shortcomings where comparative study is concerned. In most cases, there has been too little research or no reference to the cultural or environmental context, or even no attempt to probe cultural significance, all of which make it difficult to substantiate the outstanding universal value of the nominated site.

The weak point of rock art site nominations often lies in their failure to provide the necessary information and analytical criteria for a broad comparative study. How might we forge an international agreement that would give rise to a global storehouse of documentation on rock art, by means of inter-institutional cooperation, establishing international standards for registration? This would enable the identification of categories of analysis so that rock art sites, collections, and landscapes can be compared at the time the nomination is submitted. This is an urgent task yet to be undertaken.

Outstanding expressions of rock art are very often found in protected natural areas which have been included in the List as natural sites, whose conservation should take into account both their natural and their cultural values. Such a balance should be carefully monitored to ensure that any measures introduced to protect one aspect do not detract from the other. Most rock art sites on the World Heritage List have been listed as cultural sites; five have been listed as mixed sites; and, on one occasion only, rock art has been associated with sites included for their outstanding natural universal value. In eight cases, rock art sites have been placed on the List as cultural landscapes.

Criterion (iii) of the Convention, under which the site must be a unique or at least exceptional testimony to a cultural tradition or to a civilization which is living or which has disappeared, is most frequently invoked. For want of research or because of the difficulty of finding archaeological evidence associated with it, this rock art has been understood to be the sole proof of the cultural life and territory of a social group. Criterion (ii) follows in terms of frequency, and refers to an interchange of human values, which is naturally related to expressions that testify the relationship between humans and nature, forms of production, mythical forms, and so forth. Criterion (i), concerning the capacity to represent a masterpiece of human creative

genius, is cited in 12 of the 29 cases on the List, the value of which lies in the aesthetic quality of the expression.

In comparing the criteria used on different continents, it emerges that African rock art sites have been associated with mainly cultural criteria, while in the Arab States the value of rock art sites has mostly been accompanied by the natural qualities of the sites. While the Tentative List is still dominated by criterion (iii), the following significant changes to the application of criteria can be defined (Table 28.2):

- A trend toward incorporating natural features, a tendency to highlight the exceptional beauty of a site under criterion (vii), focusing on the natural beauty and aesthetic importance of the site in addition to the artistic qualities of what is represented, or on landscapes whose beauty implies that they were specially selected as iconic sites. Another clear trend is the linkage of rock art expressions to various biological, ecological, and geological processes associated with the site in which the expressions are found, or an interpretation of the natural life surrounding rock art.
- A clear preference for selecting rock art associated with caravan or trade routes, or linked to cultural itineraries, such as the Salt Route in Niger.
- A definite change of conceptual orientation so that artistic creation and creative values are no longer the uppermost focus, and that the anthropological rather than aesthetic features of the nominated sites are emphasized.

In studying the development over time of the conceptualization of rock art sites, it becomes clear that aesthetic considerations prevailed, especially in Europe, in the choice of the first sites to be placed on the World Heritage List, with the inclusion of Valcamonica (Italy), the Vézère Valley (France), and Altamira (Spain). Increasingly, greater use of that criterion was made in the next decade when the rock art of the Côa Valley (Portugal) and the rock carvings in Tanum (Sweden) were included in the List. Rock art sites in Latin America and the Caribbean did not appear on the World Heritage List until the 1990s, and African sites featured only from 2000.

## FOR THE FUTURE, LESSONS ALREADY LEARNT

The visual magnificence of rock art expressions and their capacity to reflect human cultural experience accounted for the fact that the archaeological and anthropological links were not studied in depth during the first 15 years of the Convention, according to the conceptual and theoretical frameworks of the associated scientific disciplines. It was understood that studies based on the fine arts and their registration process sufficed to justify the authenticity, integrity, and proclamation of the importance of the sites and their outstanding universal value. However, conserving rock art is a collaborative effort requiring input from archaeologists, ethnographers, anthropologists, linguists, curators, the local population, and international technical advisers. At the moment, the experts handling nominations are examining the methodological connections between rock art expressions, anthropology, and archaeology, and are seeking assistance from institutions concerned with applied conservation research. Everything points to an urgent need to explore how to confront the global problems of the conservation of rock art in terms of:

Table 28.2 Rock art sites on the tentative World Heritage List (as of May 2011)

<i>Country</i>	<i>Site name</i>	<i>Date of submission</i>	<i>Criteria</i>
Africa			
Burkina Faso	Les Gravures Rupestres de Pobe-Mengao	09/04/1996	(i), (ii), (iii), (vi)
Cameroon	Les Gravures Rupestres de Bidzar	18/04/2006	(No criteria submitted)
Central African Republic	Les Gravures Rupestres de Lengou	11/04/2006	(No criteria submitted)
Chad	La Région d'Archei: Le Paysage Naturel, Culturel et son Art Rupestre	21/07/2005	(iii), (vii), (ix)
Chad	Gravures et Peintures Rupestres de l'Ennedi et du Tibesti	21/07/2005	(No criteria submitted)
Kenya	The Mfangano-Rusinga Island Complex	2/12/2010	(iii), (vi)
Lesotho	Thaba-Bosiu National Monument	10/08/2008	(iii), (v)
Mali	Es-Souk	08/09/1999	(ii), (iv)
Mozambique	Vumba Mountain Range		(iii), (vi)
Namibia	Brandberg National Monument Area	03/10/2002	N (i), (ii), (iv) C (ii), (vi)
Niger	Itinéraires Culturels du Désert du Sahara: Route du Sel	26/05/2006	(No criteria submitted)
Niger	Le Fleuve Niger, les Iles et la Vallée	26/05/2006	(vii), (ix)
Niger	Plateau et Fortin du Djado	26/05/2006	(No criteria submitted)
Nigeria	Alok Ikom Stone Monoliths	08/10/2007	(i), (iii)
South Africa	The !Xam Khomani Heartland	05/15/2004	(iii), (iv), (v), (vi)
Zambia	Mwela Rock Paintings	10/03/2009	(iii), (v), (vi)
Zimbabwe	Ziwa National Monument	26/06/1997	(iii), (iv), (v)
Arab States			
Morocco	Aire du Dragonnier Ajjal	12/10/1998	(vii), (viii), (ix), (x) [N (i), (ii), (iii), (iv)]
Tunisia	Parc National d'El Feija	28/05/2008	(vii), (viii), (x)
Asia and Pacific			
China	The Rock Painting of the Mountain Huashan	28/03/2008	(iii), (vi)

Indonesia	Prehistoric Cave Sites in Maros-Pangkep	10/06/2009	(ix)
Iran (Islamic Republic of)	The Natural-Historical Landscape of Izeh	02/05/2008	(i), (ii), (iii), (iv), (v), (vi)
Korea	Daegokcheon Stream Petroglyphs	01/11/2010	(iii)
Kyrgyzstan	Silk Roads Sites in Kyrgyzstan	19/02/2010	(ii), (iii), (iv), (v), (vi)
Mongolia	The Upper Tsagaan Gol Complex	12/08/2009	(i), (ii)
Mongolia	The Rock Art Site of Aral Tolgoi	12/08/2009	(i), (iii)
Philippines	Petroglyphs and Petrographs of the Philippines	16/05/2006	(iii)
Uzbekistan	Zarautsoy Rock Paintings	18/01/2008	(i), (ii), (iii)
Uzbekistan	Siypantosh Rock Paintings	18/01/2008	(ii), (iii)
Uzbekistan	Sarmishsay	18/01/2008	(vi), (ix)
Europe and North America			
Bulgaria	The Magoura Cave with Drawings from the Bronze Age	01/10/1984	(i), (iii)
Canada	Ásinaí'pi	01/10/2004	(i), (iii), (iv)
France	La Grotte Ornée Chauvet-Pont d'Arc	29/06/2007	(i), (ii)
Israel	Mount Karkom	30/06/2000	(iii), (v)
Republic of Moldova	The Cultural Landscape Orheiul Vechi	30/11/2007	(v), (vii)
Romania	L'Ensemble Rupestre de Basarabi	01/03/1991	(No criteria submitted)
Latin America and the Caribbean			
Brazil	Canyon du Rio Peruacu, Minas Gerais	11/03/1998	(vii), (viii), (ix),(x)
Chile	Rupestrian Art of Patagonia	01/09/1998	(i), (ii), (iii)
Dominican Republic	Parque Nacional del Este	21/11/2001	C (i), (ii), (iii) N (ii), (iii), (iv)]
Mexico	Vallée des Cierges	06/12/2004	N (viii), (ix),(x)
Paraguay	Parque Nacional Ybyturuzu	05/10/1993	(n)N criteria submitted)
Uruguay	Chamanágá: Rock Paintings Area	24/02/2005	(iii)

Note: see <http://whc.unesco.org/en/tentativelists/>; for criteria, see <http://whc.unesco.org/en/criteria>.

- evaluation of the state of physical conservation of sites (in both observable and unobservable aspects);
- the fragility of the bedrock that supports the rock art and that accelerates erosion; and
- damage to the physical condition of the support rock.

Despite the experience amassed over almost 40 years of implementing the Convention, the geographic universality of the expressions and of the practices evolved in them, and despite the advances made in terms of registration, documentation, and cataloguing, other aspects require urgent reflection. These include: applied conservation research, preventive conservation methodologies that are readily applicable and cost-effective, and ways of identifying adaptive management mechanisms for extremely diverse cultural and geographic realities.

In this respect, we have sought to heed the experience of the managers of these sites, where significant differences occur in the understanding and implementation of management plans. Based on this management experience, combined with that of the professionals who are already working on a nomination process, it is possible to highlight where it would be desirable to strengthen procedures:

- The need to devise techniques for rapid assessment of impacts on the cultural and physical condition of the sites.
- The need to find ways of gauging the social, cultural, and economic impacts on these sites once they are nominated.
- Ensuring that the improvement, conservation, and management processes are socially and culturally participatory.
- The need to cooperate in identifying the best viable methods for storing and sharing data.
- The legitimacy of interlinking natural conservation values with the cultural values of some properties that have been included in the List, such as cultural landscapes and mixed or natural sites.

A management system guided by universal values should follow a broader approach with fresh theoretical and methodological bearings:

- Understanding the territory (site/sites) as a sociocultural space to be described in geological, geographic, geomorphologic, and bioclimatic terms (past and present conditions) in explaining the intention to intervene in the landscape.
- Settlement studies and archaeological maps permitting a diachronic understanding of the cultural forms of settlement on official maps at a significant scale, to determine the extent, unity, and coherence of the cultural identity of the human group responsible for the rock art expressions.
- Any hierarchy between the site's rock art expressions.
- Topographical and geomorphologic links and how they can be taken into account in defining the limits of the site.
- The relationship between the property and the routes of communication.
- Access to biotic and non-biotic resources.
- Use of rock art as a territorial threshold or marker.
- Ethnographic models of production and meaning of the rock art.

- The role of traditional authority in relation to rock art expressions and the decision-making procedures adopted in management strategies.

Unfortunately, the earlier nominations submitted in the mid-1990s need to be completed with official maps, scientific studies, and new national and/or regional and/or local legislation affecting the property. As part of the work of drawing up the periodic report and the respective inventory, we should be capable of outlining methods that might help countries to improve their integrated conservation of rock art sites.

Ethnography also points to other important elements: showing rock art to be part of real life. Consideration must therefore go to the cultural significance of the links between rock art expressions and ritual practices, ceremonies, and pilgrimages, and to finding a compromise between the social use of the site and international conservation agendas.

Consequently, management plans will need to describe the philosophy and direction for respecting these principles, reconciling conflicting interests and identifying priorities for the allocation of available resources. These management plans will also need to:

- Indicate precisely how the rock art sites are to be protected in order to maintain their integrity and avoid any form of vandalism.
- Specify any limitation on, or prohibition related to, the exercise of the responsibilities of institutional staff in relation to research, protection, and conservation, together with full the means of regulating such prohibition.
- Regulate the use of the sites whether or not they are included in a plan for public use.
- Establish clearly the role and responsibility of those involved in management, mediation, and decision-making, such as the employees of the organization managing the site, traditional or legal owners of the site, indigenous or local communities, government departments, local advisers, political leaders, business people, ministries involved in territorial planning, tourism planners, and NGOs.
- Work out the improvements needed in terms of legislation governing protected rock art areas.
- Foster the participation of scientists, technicians, and teachers in devising and implementing the management plan for the sake of consistency and in order to promote the values of the protected area.

## **ROCK ART IN THE FRAMEWORK OF A WORLD HERITAGE THEMATIC PROGRAMME**

In the World Heritage Thematic Programme: “Human Evolution: Adaptations, Dispersals and Social Developments” (HEADS), it is understood that the paintings and engravings provide clear and long-lasting evidence for the transmission of human conceptual thoughts and beliefs through art and graphic representations. Experiences shared by site managers and international experts have highlighted a wide range of issues, such as the spiritual significance of rock art, the need for multidisciplinary research, the value of involving the descendants of the original artists both in



management and decision-making, as well as assistance to develop guidelines for dealing with stakeholders, a better understanding of the natural processes of weathering, and the need to initiate and maintain documentation and monitoring systems for all World Heritage properties.

In this framework, rock art sites demonstrate evidence for the transmission of human conceptual thoughts and beliefs through art and graphic representations by societies through time. HEADS sees the assessment of outstanding universal value giving equal consideration to prehistoric rock art sites and rock art that originated in prehistoric times but which may have persisted into historical times.

An international meeting of experts, site managers, and state parties organized in Paris in November 2008 provided a framework for an international consultation process. This is summarized in the following section, where the recommendations toward a World Rock Art Action Plan are also presented:

The following *definition of rock art* is used in this working framework. Rock art is the manifestation of human conceptual thoughts and beliefs by traditional societies through time. Rock art can be divided into three groups based on the techniques used: petroglyphs, rock paintings, and geoglyphs. The following are *criteria for evaluation* during the process of nomination:

- state of preservation
- quality or integrity of the physical environment
- extent and quantity of rock art manifestations
- rarity of images and themes and exemplary value
- evidence of long artistic tradition
- understanding the cultural development of the artists and their cultures
- relationship of the tradition that applies to the rock art up to contemporary times
- involvement of descendants of the artists or local community
- appropriate conservation and management
- comprehensive research and potential for research
- applied research for conservation
- aesthetic quality
- interpretation

Case studies of good practice include:

- the fostering of close cooperation with descendant communities
- the unobtrusive and efficient protection of art
- training guides for rock art World Heritage sites
- guidelines for visitors and managers specific to rock art

## **A first approach for a World Rock Art Action Plan**

### *Mandate*

- Rock art, a worldwide major cultural heritage with a long-enduring tradition.
- The World Heritage List should therefore reflect its importance and diversity worldwide in a representative, balanced, and credible list.
- UNESCO should exercise its mandate to pressure the states parties for good management.

- Transnational nominations and serial nomination within countries will be encouraged.

### *Program*

- A feasibility study is required to identify geographic areas where a collaborative program for identification and nomination would be appropriate.
- Will identify several main sites per continent that could develop a feasibility study for future nomination: Africa (Matandus in Libya and Messak, Mellet Settafet in Libya), Europe (Fontainebleu Forest in France, Roco Sorcier in France), North America (Hawaii in USA, Lower Pecos in USA/ Mexico, Dinwoody in USA and the Coso Range in USA, Barrier Canyon in USA), Latin America (Toro Muerto in Peru, Sierra de Guadalupe in México), Asia and the Pacific (the Dampier Archipelago, Woodstock/Abydos, and Kimberley in Australia, Chaturbhujnath Nala in India, Daraki-Chattan in India, Kalimantan in Indonesia).
- A regional strategy of expert meetings under the umbrella of UNESCO is required to combine international and national experts as well as governmental authorities.

### *International database*

- Questionnaire sent to countries, researchers, and NGOs asking what databases they have, collections they hold, and so forth.
- Feasibility study for an international database.
- Website with links to information on rock art.
- World archive on rock art.

### *Documentation*

- Central database on what type of workshop material is available and in which languages.
- Electronic web (internet networking tool).
- Training material is available in the web page of the HEADS Programme.
- Link to national/regional database(s).

## **The Rock Art and World Heritage Convention 2009**

Further resolutions arose from the Rock Art and World Heritage Convention held in uKhahlamba Park, South Africa, in April 2009. Rock art, the manifestation of human conceptual thought and beliefs by traditional societies, has endured for longer than any other global artistic tradition with the time range extending back more than 30,000 years on the walls of caves, and as much as 75,000 years on portable rocks. Rock art is present on every continent except Antarctica, and was created in one or other form by almost every cultural tradition on earth. It is found on small islands as well as large land masses, and from the Arctic Circle to the tropical forests of Africa and South America. As Professor Emmanuel Anati from Italy said on the opening day of the meeting, “Rock Art is fundamental to World Heritage as the major archive of the history of humankind. It concerns ourselves as thinking people in a personal

way that is nevertheless universal. Rock Art is a vulnerable patrimony; what remains today is just a fraction of what existed.” The World Heritage List should therefore reflect its importance and diversity worldwide in a representative, balanced, and credible list. UNESCO, in turn, could exercise its mandate to recommend best practice management by all states parties. Trans-frontier nominations and serial nominations within countries are favored.

The generic criteria identified as important for the evaluation of outstanding universal value of rock art sites for World Heritage listing are similar to those for Human Evolution and Prehistoric sites. Those with more particular emphasis on rock art include the state of preservation of the physical environmental setting in which the rock art is found, which becomes an important aspect of the ambience and spiritual value for many cultures. While aesthetic quality and state of preservation of the rock art has value, so does the interpretation of the meaning of the art.

In evaluating the distribution, quantity, quality, and rarity of rock art themes and traditions, it was strongly recommended by the meeting that rock art sites be assessed in the context of the ideology and history of the people who created the rock art, the fabric of the site, its archaeological history, and its link with the landscape. An essential step in this process is the development of a database for each site. When compared with information from other sites, World Heritage nominations should be evaluated in terms of the global perception of what is outstanding universal value. Research and documentation are essential requirements for inter-site comparison of outstanding universal value and to start and finalize conservation and management plans.

Assessment of authenticity and integrity of narratives and themes in rock art highlighted the difference in values between rock art sites with and without ethnographic records, oral histories, or sustained significance of the place. All sites should be evaluated in relation to the content of the rock art, the archaeological context, recording and documentation that demonstrates repeated use of particular images and themes (a tradition), and evidence for development of the painting tradition(s) (e.g., monochrome to polychrome or changes in content of the art). Sites with ethnographic information, or oral history, or sustained significance of the place can include additional documentation such as the continuity of beliefs and practices through time in descendant communities, continuity in spiritual significance of the place, knowledge about the motivation and/or belief or ideological system that inspired it, the socio-economic context of the rock art, and involvement of the descendant communities and/or artists in management.

The following thematic studies were proposed:

- Rock art in North America.
- Horn of Africa. Ethiopia, Somalia, Somaliland, and Eritrea: there is a gap in knowledge of the rock art in these countries of the Horn of Africa. It was recommended that they be addressed in an ICOMOS thematic study.
- Rock art and pastoralist/farmer traditions.
- The origins of rock art.
- Interaction between contemporary traditional people and rock art.
- Ethics of management of rock art in relation to indigenous communities (sacred sites, contemporary hunter-gatherer societies, and allied issues).

- Re-evaluation of documents of inscribed World Heritage natural sites with good examples of rock art manifestations not well recorded at the time of inscription, providing case studies to improve integrated management of the site.
- Minimum standards for conservation of rock art (monitoring systems, low-cost tools).
- A register of threatened World Heritage rock art sites.
- Comparative analysis of thematic studies.

The following recommendations were made to Advisory Bodies and the World Heritage Centre:

- The ICOMOS Scientific Committees should be involved in future rock art research.
- There is a need for a pre-nomination guideline document with special focus on comparative analysis of rock art sites and related standards for documentation, including authenticity.
- There should be a revitalization of the work of the World Archive of Rock Art (WARA) for the purpose of adaptation to the work of the World Heritage Convention.

### **Serial nominations**

Serial nomination and the extension of existing sites can be considered both within countries and across borders. Site extensions automatically increase the number of stakeholders and a strategy for relationships and resources is therefore needed. Similarly, joint management of sites can be problematic and the challenge is to harmonize legal frameworks and policies. Suggestions for further analysis were made for feasible nominations and the extension and/or serial nomination of the following properties:

- North Africa: recommendations based on the ICOMOS thematic study for the region could include serial transnational nominations in the Sahara and Sahel region, an extension of Tassili n'Ajjer linking Burkina Faso, Mali, and other neighboring countries in the same geological and ecological region with rock paintings and similar prehistory; and rock engraving sites in Algeria and Morocco in a separate nomination.
- USA: sites in the southwest such as California, Utah, and Pecos River sites that cut across into Mexico could be included in a serial national or transnational property.
- Italy: extension of Valcamonica.
- Norway and Sweden: extension of rock carvings in Tanum.
- Chile and Argentina: extension of Cueva de las Manos in Patagonia.
- The Caribbean: serial transnational nomination in English-, Spanish-, and French-speaking countries.
- Amazonia: Arawaq nomadic people have a link to the rock art. The inventory of rock art in Amazonia is spectacular; however, more information is needed on rock art distribution and context in this large area that spans five countries.

- Possible transnational serial extension of inscribed site of petroglyphs within the archaeological landscape of Tamgaly Kazakhstan to include sites such as Seymuli Tash and Syuleyman Too in Kyrgyzstan.
- Central Asia: petroglyphs in Siberia.
- Saudi Arabia: collective effort for Ha'il (including Shuwaymash) and Najran (Jabal Qara) near the border of Yemen, with a possible transnational extension into Yemen.
- India: Daraki-Chattan and Chatturbhatan Nala.
- China: Huashan in Guangxi Province, Helanshan in Ningxia Province.
- Australia: Dampier Archipelago cultural precinct, Woodstock/Abydos/Spear Hill complex and Kimberley (both serial nominations) and Tasmanian rock art.

### **Additional studies suggested for Africa**

#### *South Africa*

- Possible extension of uKhahlamba/Drakensberg Park site to include a trans-frontier agreement with Lesotho for an international serial nomination of the mixed site that will include rock art to the west of the current western boundary. The buffer zone needs redefinition, and areas to the north of the current boundary that could include the Upper Tugela Valley, Golden Gate National Park, and significant paleontological sites, and in the southern and southeastern part of the Drakensberg region, will enrich the existing values linking biodiversity to rock art.
- Farmer rock art sites in the Makgabeng mountains in Limpopo Province, as this tradition is missing from the current range in Southern Africa and includes oral histories that assist in interpretation and understanding.
- Consideration of inclusion of rock art as a criterion in the Cederberg as part of the proposal to change this section of the current serial nomination of the Cape Floral Kingdom to a mixed site.

#### *Zimbabwe and Botswana*

- Zimbabwe and Botswana will be part of a recommendation to extend the Mapungubwe cultural landscape from neighboring South Africa.

#### *Mozambique*

- The initial suggestion to nominate rock art in the Vumba area has been withdrawn in favor of a larger area that includes farmer art sites in the north.

#### *Zambia*

- It might be possible to identify sites close to the border with Zaire at a later date once research has been conducted, and to link them in a serial nomination with Chongoni rock art area in Malawi.

*Tanzania, Kenya, and Uganda*

- Newly discovered sites in north-central Tanzania could be linked to Kondoa-Irangi.
- Nyeru in Uganda could be linked to the transnational serial nomination of the hunter-gatherer and pastoral art tradition in the Lake Victoria zone of Tanzania, Uganda, and Kenya.

**Arab States and West Africa**

- It was proposed that the North African sub-region of the Arab States region, which includes at least Tunisia, Morocco, Libya, Sudan, Mauretania, Central African Republic, Cameroon, Mali, Niger, Chad, Egypt, Burkina Faso, and Gabon, should be regarded as a single entity for the purposes of identifying rock art sites for future World Heritage research. The reason is that they share the same geological formations, landscape, and history of the same nomadic people responsible for much of the rock art over the past 10,000 years. The traditions were spread along ancient routes, such as the Salt Route.
- The following sites are recommended for further research: Morocco (Atlas Marocain); Algeria (Atlas Saharien, Ahaggar); Mauretania (L'Adrar Mauritaniens); Niger (Aïr, Djado, Kawar, Niger River Valley); Mali (Adrar de Ifaros); Libya (Messak); Egypt (Giff el Kebir, Nubie et Haute Egypte); Sudan (engravings in Nubie); and Burkina Faso (revise the existing sites of Markoyou to be extended to the north; Ouen Pea Doketi to be extended to the west).
- Saudi Arabia: possible cluster of sites to the east and south of Ha'il, including Showaymas. All sites in the vicinity of Najran, especially at Jabal Qara, and possibly as an international consortium together with Yemen, to cover adjacent sites there.

**Asia and the Pacific**

- India: Daraki-Chattan, Madhya Pradesh and Chaturbajan Nala, Madhya Pradesh;
- China: Huashan painting site, Guangxi Province; possibly Helanshan, Ningxia Hui Province.
- Australia: Dampier Archipelago cultural precinct, Western Australia; cluster of Abydos/Woodstock/Spear Hill complexes, eastern Pilbara, Western Australia; cluster of selective sample of Kimberley painting traditions (Wandjinas and Gwion Gwion); representative sites of Tasmania.

**Europe and North America**

- ICOMOS thematic studies on rock art should prioritize studies of sites in North America which are well documented, recorded, and researched, e.g., in Western USA and in Canada.

- Finland: Finnish rock paintings could be connected to sites in Russia, Sweden, and Norway.
- Possible extension of Siega Verde in Spain to Foz Côa in Portugal.
- Possible extension of Tanum in Sweden to Begby in Norway.
- Possible extension of Valcamonica to Valtellina, both in Italy.
- Possible expansion could be considered in Gobustan, Azerbaijan.
- USA: Hawaii, cluster of several representative sites.

## Latin America and the Caribbean

- Peru: consideration is needed to be given to the lines and geoglyphs of Nasca and Pampa de Jumana as sites relating to rock art.
- Argentina: Quebrada de Humahuaca as a rock art site and cultural landscape.
- Full understanding of rock art sites in areas nominated for natural values, e.g., Ichigualasto–Talampaya (Argentina), Parque Noel Kempff Mercado (Bolivia), Pantanal conservation area (Brazil), and San Pedro de Atacama on the World Heritage Tentative List.
- Serra da Capivara (Brazil): a possible extension is under consideration. Unify sites within the Parque Nacional Serra da Confusões which would include 120 sites in an intermediate area between the two parks.
- Fuerte de Samaipata (Bolivia): extend the natural and archaeological values by 256 ha to join with the natural values of the Valles Cruceños, Parque Nacional Amboró, currently under consideration.
- Cueva de las Manos (Argentina): extend the area of Cueva de las Manos encompassing sites of the Pinturas River and others on the central plateau of Sta. Cruz (Estancia La María), currently under consideration.
- Possible joint trans-frontier nomination for the rock art of Patagonia (Chile and Argentina).

## RECOMMENDATIONS FOR GOOD PRACTICE

The presentations on good practice highlighted a number of important issues:

### Conservation and training

The importance of conservation is clear, but there is a need for a proper strategy for conservation that considers both the rock art and the rock on which it is placed in order to preserve the physical properties of both. One method is to control access to sites or close them to the public. Examples that show the value of controlled access were cited in Spain, Portugal, and in Malawi (Chongoni rock art area) where different perspectives had to be considered. Lower visitor numbers can mean less income for management. Visitors have to be persuaded to buy into the protocol for behavior at rock art sites. Implementation needs more rock art specialists, and cooperation is required to train the new generation and to pass technical skills on to custodians, especially people in local communities. This will raise awareness so they can teach

others, but even people who have been in positions for a long time need capacity-building and re-training. It was recommended that robust guidelines for excavations in rock art sites be developed to ensure conservation of the art. The integrity of sites should be maintained by using recyclable and reversible materials with wind or solar power, as at Twyfelfontein in Namibia. It was agreed that although boardwalks can be helpful, onsite infrastructure must be carefully planned. Protected areas need to have a policy for the use of natural resources by stakeholders and local communities.

### **Documentation and interpretation**

Ongoing research is essential to keep the information at World Heritage Sites fresh and interesting for public interactions. Experiences in rock art conservation, management, and preservation can also be documented and shared. Holistic interpretation of rock art is required to understand the interaction between the past and the present and to communicate the value of the site to the public. Loss of spirituality and sense of place reduces authenticity at rock art sites, and the placement and type of information provided should be carefully considered to place rock art in the context of the archaeology and the park as a whole. Interpretation is site-specific and this should be documented and explained to visitors. A World Archive on Rock Art could be established to enable researchers to compare the relative significance of rock art in different regions and different time periods to aid assessment of their outstanding universal value.

### **Management and tourism**

The World Heritage operational guidelines make management plans essential in the short and long term, but are they enough? Does the generic system for management plans need rethinking? Generic and site-specific management plans for rock art are needed, and management plans came under intense scrutiny during discussion. Many management plans are written according to a formula and are often not fully implemented. Some delegates thought that insufficient attention was paid to clarifying who is responsible for what, and how the individual management partners are coordinated. Proper communication and synergy are needed, especially because most rock art sites are complex and different departments for nature and culture are involved. For example, site managers in the uKhahlamba/Drakensberg Park should think constructively about how to overcome the legacy of a wilderness area so that the cultural heritage is managed on an equal basis with the natural values. But management plans must also help managers to face daily problems, including issues such as solid and liquid waste and pollution. Local communities must be involved in management and decision-making, and the same applies to descendant indigenous communities whose views on the management of rock art should be adequately considered. While the participation of local communities is desirable, we should also help local people to realize their capacity as independent entrepreneurs increasing their “ownership” of the site(s).

Land-ownership disputes within communities are common and can be (partially) addressed through the creation of buffer zones. These must include tourism master plans, and managers often need training in tourism management. Many site managers



are frustrated that heritage is not properly resourced, even at the World Heritage level. In general, there is a need for better quality-control mechanisms to critique the work being done, and site managers can help the World Heritage Committee to identify how difficult their task is on a daily basis. There is no doubt that there is a need for a management system that follows a broader approach informed by fresh theory and methodology.

In terms of methodologies and guidelines, site managers would benefit from techniques for the rapid assessment of impacts on the cultural and physical condition of rock art sites, as well as guidance on the ways of gauging social, cultural, and economic impacts. It seems to help management authorities if the intention to proscribe an area in the landscape is explained by understanding the territory as a sociocultural space. This can be visualized in terms of past and present geology, geography, geomorphology, and bioclimate, and how topographic and geomorphologic links have been taken into account in defining the limits of the site.

It would be beneficial if management plans for World Heritage rock art sites indicate precisely how the rock art sites are to be protected to maintain their integrity and avoid vandalism, how use of the sites is to be regulated, and whether or not they are open for public use; and also specify the limitations or prohibitions related to responsibilities of institutional staff with regard to research, protection, and conservation, together with the means of regulating such prohibitions.

### **Conservation plan**

The conservation plan should consider:

- proper investigation;
- monitoring of different parameters affecting conservation to help in understanding processes, supporting security of ongoing work, and measuring the effectiveness of conservation work;
- understanding natural and human dynamics and their relationship with rock art preservation;
- most appropriate, least invasive techniques for conservation;
- effective and timely evaluation and implementation of new scientific techniques aimed at revising and maintaining the conservation plan;
- the anthropological study of the related community, if not considered elsewhere; and
- conservation works supervised by an interdisciplinary team.

A priority was identified in terms of organizing an international conference on rock art conservation. This would include the many sciences relevant to providing data, information, and solutions for rock art sites and related environments. Useful sciences vary according to the target problem, but a preliminary list might include archaeology; earth sciences (e.g., geology, petrography, geomorphology, sedimentology, geophysics, engineering geology), ecology, biology (e.g., botanic, zoology), chemistry, physics (e.g., climate, meteorology, hydrology), architecture, civil engineering, and restoration. The outcome of the international conference should be guidelines for the establishment of a proper conservation plan. There is a need for capacity

building: with both the development of professional skills for rock art conservation and at different levels of specialization.

### Rock art management

The management of rock art sites on the World Heritage List has become an issue of major concern, particularly with regard to research on conservation methods, preventative conservation, and the identification of adaptive management measures for the great diversity of cultural and geographic contexts in which rock art is found. The following issues were found to be crucial for the successful management of World Heritage rock art sites:

- *Stakeholder management* There is a need for the World Heritage Committee to develop a set of minimum standards for stakeholder engagement, drawing on exemplary practices from different state parties.
- *Institutional and legislative frameworks* The World Heritage Committee should encourage state parties, where legislation is not adequate, to put in place the necessary legislative and institutional frameworks for the protection of World Heritage sites.
- *Information management and heritage resources* There is a need to recognize the centrality of information management of rock art sites. The World Heritage Committee should encourage the World Heritage Centre to develop: (a) a set of information management standards (e.g., metadata standards), and (b) information sharing tools.
- *Infrastructure and professional standards* The World Heritage Committee should encourage the World Heritage Centre to develop a series of best practice guidelines for sustainable development of World Heritage Sites, which includes professional and infrastructural standards.
- *Resourcing/Funding* The World Heritage Committee is requested to provide preferential funding through its funding agencies to support nominations of prehistoric sites in order to rectify the imbalances on the World Heritage List and to focus on prehistoric sites which are already on the list but experiencing financial challenges in operationalizing plans.

### CONCLUSION

Following the adoption of the Global Strategy by the World Heritage Committee in 1999, rock art sites have become a regular feature in discussions around inscriptions and further research regarding World Heritage. Considering that these sites can be found in all continents, representing forms of human expressions from a very large period of history, the number of rock art sites featured on the World Heritage List is still rather limited.

There is definitely a need to further research the importance of the world's rock art sites. Past nominations have often shown weaknesses with regard to the analysis and interpretation of the cultural significance of the individual sites and comparative studies among rock art sites. Research should therefore include looking into the value

of rock art as a form of expression, stepping away from a purely aesthetic approach, and moving toward a consideration of these sites as bearing witness to the history of humankind. This will require the adoption of a global approach to the study of rock art sites and the encouragement of more serial and trans-boundary nominations to ensure the conservation of authenticity and integrity and for the promotion of outstanding universal value. Such an approach will foster a more balanced representation of rock art properties on the World Heritage List, reflecting the global diversity of this heritage.

There is also a need to link the values of the sites to the development of concrete conservation and management systems. The nature of rock art sites presents a number of preservation constraints. The structural conditions of rock art sites – both the art itself and the bearers – are often very vulnerable, and their long-term preservation requires not only physical conservation, but also appropriate site management. Rock art sites need to apply appropriate visitor management regulations, a process that is often complicated because of the mixed natural and cultural values of these sites, each requiring specific management, conservation, applied research, and methodological approaches. The scope of the HEADS Programme is to contribute to the exploration of how the World Heritage Convention and the international community can be significant tools in this endeavor.

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